

## CITY COUNCIL REGULAR MEETING AGENDA

REGULAR COUNCIL MEETING  
TUESDAY  
JULY 2, 2024

COUNCIL CHAMBERS  
211 WEST ASPEN AVENUE  
3:00 P.M.

All City Council Meetings are live streamed on the city's website  
(<https://www.flagstaffaz.gov/1461/Streaming-City-Council-Meetings>)

### **\*\*\*PUBLIC COMMENT\*\*\***

Verbal public comments not related to items appearing on the posted agenda may be provided during the "Open Call to the Public" at the beginning and end of the meeting and may only be provided in person.

Verbal public comments related to items appearing on the posted agenda may be given in person or online and will be taken at the time the item is discussed.

To provide online verbal comment on an item that appears on the posted agenda, use the link below.

### [ONLINE VERBAL PUBLIC COMMENT](#)

Written comments may be submitted to [publiccomment@flagstaffaz.gov](mailto:publiccomment@flagstaffaz.gov). All comments submitted via email will be considered written comments and will be documented in the record as such.

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#### 1. CALL TO ORDER

##### **NOTICE OF OPTION TO RECESS INTO EXECUTIVE SESSION**

*Pursuant to A.R.S. §38-431.02, notice is hereby given to the members of the City Council and to the general public that, at this regular meeting, the City Council may vote to go into executive session, which will not be open to the public, for discussion and consultation with the City's attorneys for legal advice on any item listed on the following agenda, pursuant to A.R.S. §38-431.03(A)(3).*

#### 2. ROLL CALL

*NOTE: One or more Councilmembers may be in attendance through other technological means.*

MAYOR DAGGETT

VICE MAYOR ASLAN

COUNCILMEMBER HARRIS

COUNCILMEMBER HOUSE

COUNCILMEMBER MATTHEWS

COUNCILMEMBER MCCARTHY

COUNCILMEMBER SWEET

#### 3. PLEDGE OF ALLEGIANCE, MISSION STATEMENT, AND LAND ACKNOWLEDGEMENT

##### **MISSION STATEMENT**

*The mission of the City of Flagstaff is to protect and enhance the quality of life for all.*

##### **LAND ACKNOWLEDGEMENT**

*The Flagstaff City Council humbly acknowledges the ancestral homelands of this area's Indigenous nations and original stewards. These lands, still inhabited by Native descendants, border mountains sacred to Indigenous peoples. We honor them, their legacies, their traditions, and their continued contributions. We celebrate their past, present, and future generations who will forever know this place as home.*

#### 4. OPEN CALL TO THE PUBLIC

*Open Call to the Public enables the public to address the Council about an item that is not on the prepared agenda. Comments relating to items that are on the agenda will be taken at the time that the item is discussed. Open Call to the Public appears on the agenda twice, at the beginning and at the end. The total time allotted for the first Open Call to the Public is 30 minutes; any additional comments will be held until the second Open Call to*

*the Public.*

*If you wish to address the Council in person at today's meeting, please complete a comment card and submit it to the recording clerk as soon as possible. Your name will be called when it is your turn to speak. You may address the Council up to three times throughout the meeting, including comments made during Open Call to the Public and Public Comment. Please limit your remarks to three minutes per item to allow everyone an opportunity to speak. At the discretion of the Chair, ten or more persons present at the meeting and wishing to speak may appoint a representative who may have no more than fifteen minutes to speak.*

**5. PROCLAMATIONS AND RECOGNITIONS**

- A. **Proclamation:** Arbor Day
- B. **Proclamation:** Disability Pride Month
- C. **July Work Anniversaries**

Recognition of employees celebrating work anniversaries in July.

**6. COUNCIL LIAISON REPORTS**

**7. LIQUOR LICENSE PUBLIC HEARINGS**

*Applications under Liquor License Public Hearings may be considered under one public hearing and may be acted upon by one motion unless otherwise requested by Council.*

**STAFF RECOMMENDED ACTION:**

1. Open the Public Hearing
2. Staff Presentation
3. Council Questions
4. Public Comment
5. Close Public Hearing
6. Council Deliberation and Action

The City Council has the option to:

1. Forward the application to the State with a recommendation for approval;
2. Forward the application to the State with a recommendation for denial based on the testimony received at the public hearing and/or other factors.

- A. **Consideration and Action on Liquor License Application:** Douglas Carlton Sweet III, "The Station Cafe", 1800 N. Fort Valley Rd., Series 12 (Restaurant), New License

**STAFF RECOMMENDED ACTION:**

1. Forward the application to the State with a recommendation for approval;
2. Forward the application to the State with a recommendation for denial based on the testimony received at the public hearing and/or other factors.

**8. CONSENT AGENDA**

*All matters under Consent Agenda are considered by the City Council to be routine. Unless a member of City Council expresses a desire at the meeting to remove an item from the Consent Agenda for discussion, the Consent Agenda will be enacted by one motion approving the recommendations listed on the agenda. Unless otherwise indicated, expenditures approved by Council are budgeted items.*

**STAFF RECOMMENDED ACTION:**

Approve the Consent Agenda as posted.

- A. **Consideration and Approval of Contract:** Approve the First Amendments to 21 Job Order Professional Contracting Services Contracts to increase project limits and annual contractor caps for the Job-Order-Contracting Program.

**STAFF RECOMMENDED ACTION:**

1. Approve the First Amendments to 21 Job Order Professional Contracting Services Contracts to increase individual project limits to \$2,000,000 and annual contractor caps to \$10,000,000 for the Job-Order-Contracting Program for each of the following contractors:
  - Horizontal Construction: Eagle Mountain Construction Co., Kinney Construction Services, Inc. Markham Contracting Co., Inc., and Tiffany Construction Co.
  - Vertical Construction: Kinney Construction Services, Inc., Loven Contracting, Inc., and Wespac Construction, Inc.
  - Water/Wastewater General Construction: KEAR Civil Corporation, PCL Construction, Inc., and Schofield Civil Construction, Inc.
  - Water/Wastewater Controls Construction: M3 Engineering and Technology Corporation and Southwest Automation Services, LLC
  - Landfill Construction: Fann Contracting Inc., Markham Contracting Co., Inc. and Rummel Construction, Inc
  - Airport Horizontal: Combs Construction Company, Inc., Fann Contracting, Inc., J. Banicki Construction, Inc.
  - Airport Vertical: FCI Constructors, Inc., Loven Contracting, Inc., Wespac Construction, Inc.
2. Authorize the City Manager to execute the necessary documents.

- B. **Consideration of Appointments:** Magistrate and On-Call Magistrates for the Flagstaff Municipal Court.

**STAFF RECOMMENDED ACTION:**

Approve the appointments of Honorable James Speed and On-Call Magistrates Charles Adornetto, Staci Foulks and Roberta McVickers to the Flagstaff Municipal Court

- C. **Consideration and Approval of Contract:** Arizona 911 Grant Agreement between Arizona Department of Administration Office of Grants and Federal Resources and the City of Flagstaff acting as System Administrator for Coconino County.

**STAFF RECOMMENDED ACTION:**

Approve the acceptance of the grant from the Arizona Department of Administration Office of Grants and Federal Resources in the amount of \$524,958.00 for the 911 budget for Coconino County FY2025.

- D. **Consideration and Approval of Contract:** Professional services contract for the Wastewater Treatment Facilities Master Plan in the amount of \$792,160.

**STAFF RECOMMENDED ACTION:**

1. Approve the Professional Services Contract with Hazen and Sawyer for the completion of the Treatment Facilities Master Plan in the amount of \$792,160.
2. Authorize the City Manager to execute the necessary documents.

- E. **Consideration and Approval of Contract:** Cooperative Purchase Contract with Pueblo Mechanical and Controls, LLC in the amount of \$599,833.26 for chiller replacement in City Hall.

**STAFF RECOMMENDED ACTION:**

1. Approve the Cooperative Purchase Contract with Pueblo Mechanical and Controls, LLC ("Pueblo") in the amount of \$599,833.26 for chiller replacement in City Hall; and
2. Authorize the City Manager to execute the necessary documents.

- F. **Consideration and Approval of Contract:** Second Amendment to Contract for Services with TB Real Property Consultants, LLC for property acquisitions necessary for the Rio de Flag Flood Control Capital Project in an amount not to exceed \$150,000.

**STAFF RECOMMENDED ACTION:**

1. Approve Second Amendment to Contract for Services in an amount not to exceed \$150,000 for property acquisitions necessary for the Rio de Flag Flood Control Capital Project; and
2. Authorize the City Manager or designee to execute the necessary documents.

- G. **Consideration and Approval of Contract:** Consideration and Approval of Contract: Second Amendment to Contract for Services with Sonoran Land Resources, LLC for property acquisitions necessary for the Rio de Flag Flood Control Capital Project in an amount not to exceed \$150,000.

**STAFF RECOMMENDED ACTION:**

1. Approve Second Amendment to Contract for Services in an amount not to exceed \$150,000 for property acquisitions necessary for the Rio de Flag Flood Control Capital Project; and
2. Authorize the City Manager or designee to execute the necessary documents.

- H. **Consideration and Approval of Contract:** Contract for the Purchase of Materials/Services with Empire Pump Corp. in an amount not to exceed \$650,000, annually, for Utilities Well and Pump Maintenance.

**STAFF RECOMMENDED ACTION:**

1. Approve the Contract for the Purchase of Materials/Services with Empire Pump Corp. in an amount not to exceed \$650,000, annually, for Utilities Well and Pump Maintenance; and
2. Authorize the City Manager to execute the necessary documents.

- I. **Consideration and Approval of Contract:** Professional Services Agreement with Friedman Recycling Company for compaction, transportation, and the processing of recyclable materials.

**STAFF RECOMMENDED ACTION:**

1. Approve the Professional Services Agreement with Friedman Recycling Company for compaction, transportation, processing, and the processing of recyclable materials; and
2. Authorize the City Manager to execute the necessary documents.

- J. **Consideration and Approval of Letter of Opposition:** Letter of opposition to UNS Electric, Inc. Arizona Power Plant and Transmission Line Siting Committee Application and Appeal to the Arizona Corporation Commission.

**STAFF RECOMMENDED ACTION:**

Retroactively approve the Letter of Opposition.

- K. **Consideration and Approval of Grant Award Ratification:** Approve the ratification of the U.S. Department of Justice, through the Arizona Criminal Justice Commission, for the Edward Byrne Justice Assistance Grant Agreement in the amount of \$292,485.09 for the Northern Arizona Street Crimes Task Force (METRO Unit).

**STAFF RECOMMENDED ACTION:**

Approve the ratification of the grant agreement from the U.S. Department of Justice, through the Arizona Criminal Justice Commission, Edward Byrne Justice Assistance Grant funds in the amount of \$292,485.09 for FY2024-FY2025.

- L. **Consideration and Approval of Contract:** Construction Manager at Risk (CMAR) Design Phase Services Contract with Loven-Fann Joint Venture in an amount not to exceed \$700,000 for the Airport Snow Removal Equipment Building Project.

**STAFF RECOMMENDED ACTION:**

1. Award the CMAR Design Phase Services contract with Loven-Fann Joint Venture in an amount not to exceed \$700,000, subject to approval by the Federal Aviation Administration (FAA) and Arizona Department of Transportation (ADOT) Multi-Modal Transportation Division; and
2. Authorize Change Order Authority of \$70,000 (10%) to cover potential costs associated with unanticipated or additional items of work. This change order amount is included in the total not to exceed amount of \$700,000; and
3. Authorize the City Manager to execute the necessary documents.

- M. **Consideration and Approval of Contract:** Cooperative Purchase Contract with Hughes Fire Equipment, Inc. in the amount of \$1,064,108.07, plus fees and costs, for the purchase of two Fire Department Water Tenders with Bond funding.

**STAFF RECOMMENDED ACTION:**

1. Approve the Cooperative Purchase Contract with Hughes Fire Equipment, Inc. in the amount of \$1,064,108.07, plus fees and costs, for the purchase of two Fire Department Water Tenders with Bond funding; and
2. Authorize the City Manager to execute the necessary documents.

9. **ROUTINE ITEMS**

- A. **Consideration and Adoption of Ordinance No. 2024-17:** An ordinance levying upon the assessed valuation of the property within the City of Flagstaff, Arizona, subject to taxation a certain sum upon each one hundred dollars (\$100.00) of valuation sufficient to raise the amount estimated to be required in the annual budget, less the amount estimated to be received from other sources of revenue; providing funds for various bond redemptions, for the purpose of paying interest upon bonded indebtedness and providing funds for general municipal expenses, all for the Fiscal Year ending the 30th day of June 2025. **(Primary and secondary property tax levies for FY 2024-2025)**

**STAFF RECOMMENDED ACTION:**

1. Read Ordinance No. 2024-17 by title only for the final time
2. City Clerk reads Ordinance No. 2024-17 by title only (if approved above)
3. Adopt Ordinance No. 2024-17

- B. **Consideration and Adoption of Resolution No. 2024-30 and Ordinance No. 2024-19:** A Resolution of the Flagstaff City Council declaring as a public record that certain document filed with the City Clerk and entitled "*Water Services Rates Code Changes*" and An Ordinance of the City Council of the City of Flagstaff, amending the Flagstaff City Code Title 3, Business Regulations, Section 3-10-001-0008 License Fees and Title 7, Health and Sanitation, Chapter 7-02 Wastewater Regulations, and Chapter 7-03 Water Regulations, by adopting by reference that certain document entitled "*Water Services Rates Code Changes*"; providing for penalties, repeal of conflicting ordinances, severability, and establishing an effective date

**STAFF RECOMMENDED ACTION:**

1. Adopt Resolution No. 2024-30
2. Read Ordinance No. 2024-19 by title only for the final time
3. City Clerk reads Ordinance No. 2024-19 by title only (if approved above)
4. Adopt Ordinance No. 2024-19

- C. **Consideration and Adoption of Ordinance No. 2024-18:** An ordinance of the City Council of the City of Flagstaff, authorizing the exchange of real property of substantially equal value with property owners, Gary G. and Mary Eileen Hundelt; providing for severability, authority for clerical corrections, and establishing an effective date; and

**Consideration and Approval of Purchase Agreement** with Gary G. and Mary Eileen Hundelt.

**STAFF RECOMMENDED ACTION:**

1. Read Ordinance No. 2024-18 by title only for the final time
2. City Clerk reads Ordinance No.2024-18 by title only (if approved above)
3. Adopt Ordinance No. 2024-18
4. Approve the Purchase Agreement and authorize the City Manager to execute the necessary documents.

- D. **Consideration and Adoption of Resolution No. 2024-32 and Ordinance No. 2024-20:** A resolution of the Flagstaff City Council declaring as a public record that certain document filed with the City Clerk and entitled "2024 Revisions to Floodplain Regulations" and an ordinance of the City Council of the City of Flagstaff, amending the Flagstaff City Code, Title 12 Floodplains, Chapter 12-01 Flood Plain Regulations, by adopting by reference that certain document entitled "2024 Revisions to Floodplain Regulations"; providing for penalties, repeal of conflicting ordinances, severability, and establishing an effective date

**STAFF RECOMMENDED ACTION:**

1. Adopt Resolution No. 2024-32
2. Read Ordinance No. 2024-20 by title only for the final time
3. City Clerk reads Ordinance No. 2024-20 by title only for the final time
4. Adopt Ordinance No. 2024-20

- E. **Consideration and Approval of Contract:** Second Amendment to the Construction Manager at Risk (CMAR) Construction Phase Services Agreement with Eagle Mountain Construction, Inc. for the Spruce Wash Flood Mitigation Suite of Projects to add Guaranteed Maximum Price (GMP) 3.

**STAFF RECOMMENDED ACTION:**

1. Approve the Second Amendment to the CMAR Construction Phase Services Agreement with Eagle Mountain Construction, Inc. for the Spruce Wash Flood Mitigation Suite of Projects to include GMP 3 in the amount of \$2,907,375.00 and adding 0 days to the contract duration; and
2. Approve an Owner's Contingency of \$50,000, which is approximately 2.0% of Guaranteed Maximum Price #3; and
3. Authorize the City Manager to execute the necessary documents.

- F. **Consideration and Approval of Contract:** Approve Change Order No. 18 with Shephard Wesnitzer, Inc. in the amount of \$214,480.00 and a 365 calendar day time extension for the Rio de Flag Flood Control Utility Relocation Design Services Contract.

**STAFF RECOMMENDED ACTION:**

1. Approve Change Order No. 18 with Shephard Wesnitzer, Inc. the amount of \$214,480.00 and a 365 calendar day time extension for the Rio de Flag Flood Control Utility Relocation Design Services Contract; and
2. Authorize the City Manager to execute the necessary documents.

- G. **Consideration and Approval of Preliminary Plat:** PZ-23-00027-01: Preliminary replat of lots 23-24 and Tract E of the "Final Plat for Coconino Ridge at Pine Canyon"

**STAFF RECOMMENDED ACTION:**

Approve the Preliminary Plat in accordance with the findings presented in this report and the Planning and Zoning Commission recommendation of approval (5-0 vote in favor on May 22, 2024).

H. **Consideration of Approval:** City of Flagstaff Workforce Analysis and Strategic Plan

**STAFF RECOMMENDED ACTION:**

Approve the Workforce Analysis and Strategic Plan.

10. **REGULAR AGENDA**

- A. **Consideration and Adoption of Resolution No. 2024-33:** A resolution approving the extension of an Intergovernmental Agreement between the City of Flagstaff and Coconino County regarding the County's continued use of the Joe C. Montoya Community and Senior Center to operate its Senior Nutrition Programs.

**STAFF RECOMMENDED ACTION:**

1. Read Resolution No. 2024-33 by title only
2. City Clerk reads Resolution No. 2024-33 by title only (if approved above)
3. Adopt Resolution No. 2024-33

- B. **Consideration and Adoption Resolution No. 2024-34:** A resolution of the Flagstaff City Council authorizing approval of the Northeastern Arizona Indian Water Rights Settlement Agreement

**STAFF RECOMMENDED ACTION:**

1. Read Resolution No. 2024-34 by title only
2. City Clerk reads Resolution No. 2024-34 by title only (if approved above)
3. Adopt Resolution No. 2024-34

11. **DISCUSSION ITEMS**

- A. **Annual Update of the CARE Unit**

**STAFF RECOMMENDED ACTION:**

Update only

- B. **Sharing of Information About Crisis Mobile Services**

**STAFF RECOMMENDED ACTION:**

This presentation is for informational purposes only.

12. **OPEN CALL TO THE PUBLIC**

13. **INFORMATIONAL ITEMS TO/FROM MAYOR, COUNCIL, AND STAFF, AND FUTURE AGENDA ITEM REQUESTS**

14. **ADJOURNMENT**

**CERTIFICATE OF POSTING OF NOTICE**

The undersigned hereby certifies that a copy of the foregoing notice was duly posted at Flagstaff City Hall on \_\_\_\_\_, at \_\_\_\_\_ a.m./p.m. in accordance with the statement filed by the City Council with the City Clerk.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 2024.

\_\_\_\_\_  
Stacy Saltzburg, MMC, City Clerk

THE CITY OF FLAGSTAFF ENDEAVORS TO MAKE ALL PUBLIC MEETINGS ACCESSIBLE TO PERSONS WITH DISABILITIES. With 48-hour advance notice, reasonable accommodations will be made upon request for persons with disabilities or non-English speaking residents. Please call the City Clerk (928) 213-2076 or email at [stacy.saltzburg@flagstaffaz.gov](mailto:stacy.saltzburg@flagstaffaz.gov) to request an accommodation to participate in this public meeting.

NOTICE TO PARENTS AND LEGAL GUARDIANS: Parents and legal guardians have the right to consent before the City of Flagstaff makes a video or voice recording of a minor child, pursuant to A.R.S. § 1-602(A)(9). The Flagstaff City Council meetings are live-streamed and recorded and may be viewed on the City of Flagstaff's website. If you permit your child to attend/participate in a televised Council meeting, a recording will be made. You may exercise your right not to consent by not allowing your child to attend/participate in the meeting.

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Stacy Saltzburg, City Clerk  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



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**TITLE:**  
**July Work Anniversaries**

**DESIRED OUTCOME:**  
Recognition of employees celebrating work anniversaries in July.

**Executive Summary:**

**Information:**

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**Attachments:** [Presentation](#)



# TEAM FLAGSTAFF



# July Employee Work Anniversaries!







# TEAM FLAGSTAFF

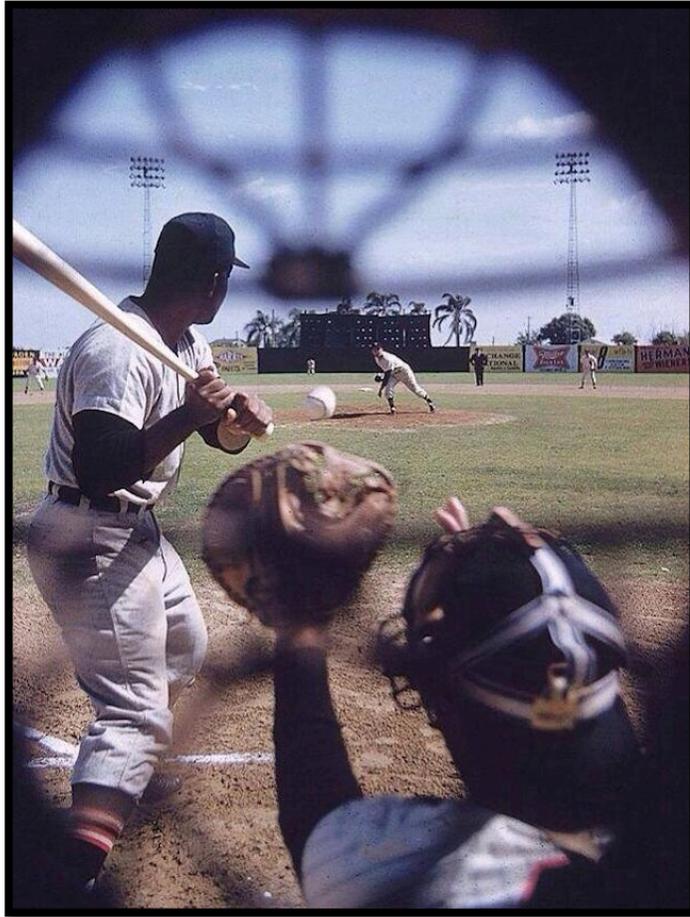


## First Year Anniversaries

- Karen Benally, Construction Inspector
- Nilay Jones, Library Clerk
- Courtney West, Building Permit Technician
- Francis Huck, Maintenance Worker I



# Five Year Anniversaries



Christopher Green  
Recreation Official I



**TEAM FLAGSTAFF**  
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# Five Year Anniversaries

Ryan Medley  
Police Officer



**TEAM FLAGSTAFF**  
WE MAKE THE CITY BETTER



# Five Year Anniversaries



Jared Bohn  
Water Services Operator



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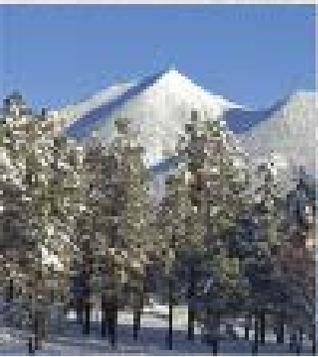
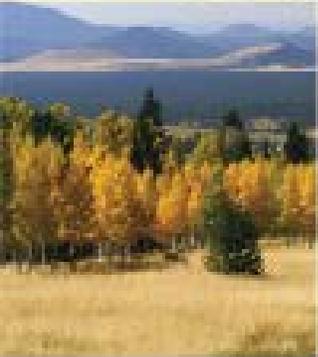




# Ten Year Anniversaries



Armando Cruz  
Facilities Maintenance Worker

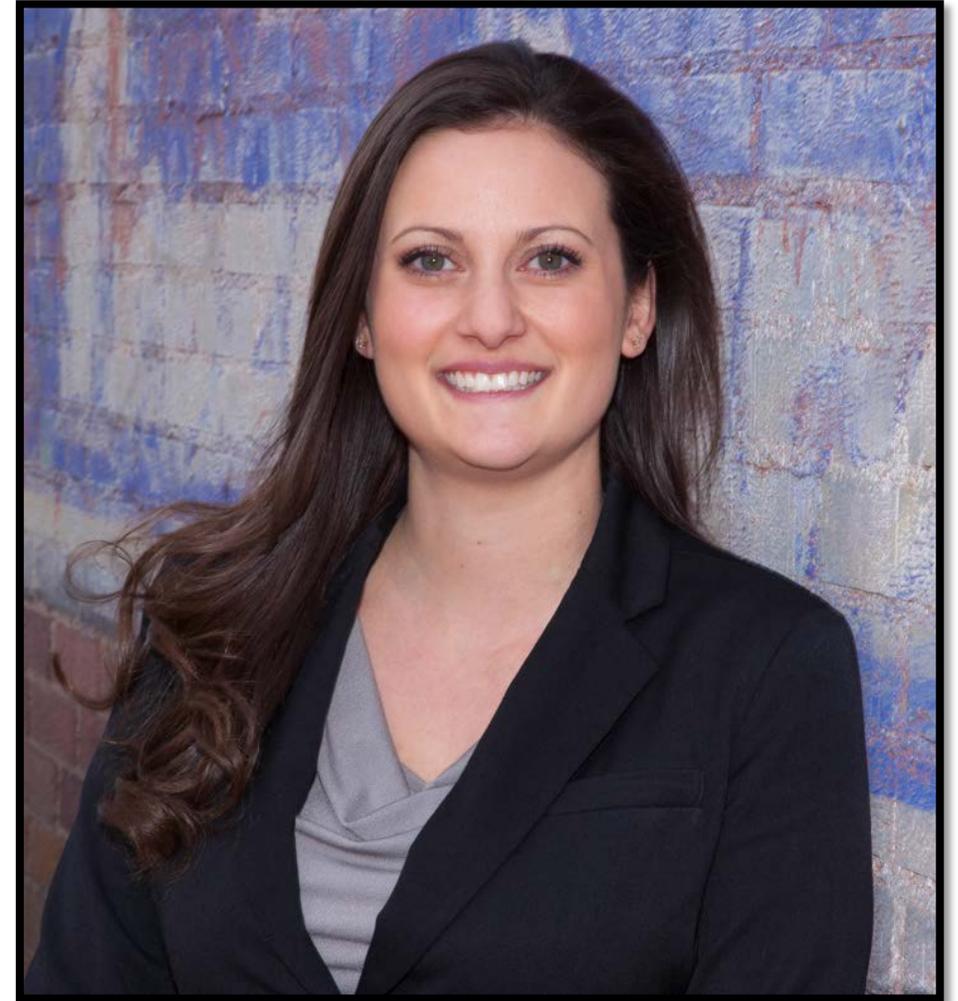


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# Ten Year Anniversaries

Jessica Young  
Sales Specialist



**TEAM FLAGSTAFF**  
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# Twenty Year Anniversaries



Chris Samples  
Fire Captain Paramedic



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# Twenty Year Anniversaries

Chris Romero  
Fire Engineer Paramedic



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# Twenty-Five Year Anniversary

Scott Strohmeyer  
Fire Captain



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# Thirty Year Anniversary

Trish has shown versatility and adaptation to meet many challenges over the course of her 30 years at the Tuba City Public Library. She is committed to her work and is resourceful in carrying out her daily duties following the protocols as a City of Flagstaff employee. Trish works as a team player with her colleagues Pearl, Sina and Delmar at the Tuba City Public Library. Together they make selections for library materials while weeding outdated and damaged materials. Trish is courteous, patient, and respectful among library patrons and library staff countywide. Trish resolves matters with a cool and calm demeanor and is always willing to help with tasks that arise including offering recommendations and implementation of library programs and grant monies. Trish is an invaluable employee to the Flagstaff City-Coconino County Library System.



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# Thirty-Five Year Anniversary

Cathleen Harrison – Fazzary began her employment with the Flagstaff Municipal Court in July of 1989, as a Court Clerk I. Through the years she promoted to Court Clerk II and ultimately to Deputy Court Administrator in May of 2001, she continues to serve in this capacity where she oversees Court Services. Cathleen is extremely dependable, highly respected and is an essential member of the Court.

The Court is appreciative of Cathleen's hard work, we thank her for her dedication and congratulate her on her 35-year work anniversary.



**TEAM FLAGSTAFF**  
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**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Stacy Saltzburg, City Clerk  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



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**TITLE:**

**Consideration and Action on Liquor License Application:** Douglas Carlton Sweet III, "The Station Cafe", 1800 N. Fort Valley Rd., Series 12 (Restaurant), New License

**STAFF RECOMMENDED ACTION:**

1. Forward the application to the State with a recommendation for approval;
2. Forward the application to the State with a recommendation for denial based on the testimony received at the public hearing and/or other factors.

**Executive Summary:**

The liquor license process begins at the State level and applications are then forwarded to the respective municipality for posting of the property and holding a public hearing, after which the Council recommendation is forwarded back to the State. A Series 12 license allows the holder of a restaurant license to sell and serve spirituous liquor solely for consumption on the premises of an establishment which derives at least forty percent (40%) of its gross revenue from the sale of food. The Station Cafe is an existing business in Flagstaff, operating with a temporary license. If approved, it will be one of 93 series 12 licenses in Flagstaff. Series 12 licenses are non-quota licenses. To view surrounding liquor licenses, please visit the [Active Liquor Licenses Map](#).

Because the application is for a new license, consideration may be given to both the location and the applicant's personal qualifications.

The application was properly posted on June 11, 2024 and the Police and Community Development divisions have reviewed the application and provided their respective reports. No written protests have been received to date.

**Financial Impact:**

There is no budgetary impact to the City of Flagstaff as this is a recommendation to the State.

**Policy Impact:**

Not applicable

**Previous Council Decision or Community Discussion:**

Not applicable

**Options and Alternatives to Recommended Action:**

1. Forward the application to the State with a recommendation for approval;
2. Forward the application to the State with a recommendation for denial based on the testimony received at the public hearing and/or other factors.

**Connection to PBB Priorities and Objectives:**

Liquor licenses are a regulatory action and there are no Community Priorities that directly apply.

**Connection to Regional Plan:**

Not applicable

**Connection to Carbon Neutrality Plan:**

Not applicable

**Connection to 10-Year Housing Plan:**

Not applicable

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**Attachments:**    [Letter to Applicant](#)  
                          [Hearing Procedures](#)  
                          [Series 12 Description](#)  
                          [PD Memo](#)  
                          [CD Memo](#)  
                          [Map](#)



# CITY OF FLAGSTAFF

## Office of the City Clerk

6/14/2024

Douglas Sweet III  
1800 N. Fort Valley Rd.  
Flagstaff, AZ 86004

Dear Mr. Sweet,

Your application for a Series 12 Restaurant Liquor License for The Station Cafe located at 1800 N. Fort Valley Road., Flagstaff, AZ was posted on June 11, 2024. The City Council will consider the application at a public hearing during their scheduled Regular City Council Meeting on **July 2, 2024, which is scheduled to begin at 3:00 p.m.**

It is important that you or your representative attend this Council Meeting via video conference ([Microsoft Teams Meeting](#)) or in person and be prepared to answer any questions the City Council may have. Failure to be available for questions could result in a recommendation for denial of your application. We suggest you contact your legal counsel or the Department of Liquor Licenses and Control at 602-542-5141 to determine the criteria for your license. To help you understand how the public hearing process will be conducted, we are enclosing a copy of the City's liquor license application hearing procedures.

The twenty-day posting period for your liquor license application is set to expire on July 2, 2024, and the application may be removed from the premises at that time.

There is an \$815 application fee which needs to be received before the hearing date. Payment can be made online at <https://www.flagstaff.az.gov/2452/E--Services> under Business Licensing Payment Online Services by clicking Liquor License Request Payment, in person at the payment window, or you can send a check to my attention at 211 W. Aspen Ave., Flagstaff, AZ 86001.

If you have any questions, please email me at [stacy.saltzburg@flagstaffaz.gov](mailto:stacy.saltzburg@flagstaffaz.gov).

Sincerely,

Stacy Saltzburg  
Communication and Civic Engagement Director / City Clerk

Enclosures



# City of Flagstaff

## Liquor License Application Hearing Procedures

1. When the matter is reached at the Council meeting, the presiding officer will open the public hearing on the item.
2. The presiding officer will then ask whether City staff have information to present to the Council regarding the application. Staff should come forward at this point and present information to the Council in a presentation not exceeding ten (10) minutes. Council may question City staff regarding the testimony or other evidence provided by City staff.
3. The presiding officer will request that the Applicant come forward to address the Council regarding the application. The applicant can give a presentation not exceeding ten (10) minutes. Council may question the Applicant regarding the testimony or other evidence provided by the Applicant.
4. Other parties, if any, may then testify, limited to three (3) minutes per person. Council may question these parties regarding the testimony they present to the Council.
5. The Applicant may make a concise closing statement to the Council, limited to five (5) minutes. During this statement, Council may ask additional questions of the Applicant.
6. City staff may make a concise closing statement to the Council, limited to five (5) minutes. During this statement, Council may ask additional questions of City Staff.
7. The presiding officer will then close the public hearing.
8. The Council will then, by motion, vote to forward the application to the State with a recommendation of approval, disapproval, or shall vote to forward with no recommendation.

## License Types: Series 12 Restaurant License

Non-transferable

On-sale retail privileges

Note: Terms in **BOLD CAPITALS** are defined in the [glossary](#).

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### PURPOSE:

Allows the holder of a restaurant license to sell and serve spirituous liquor solely for consumption on the premises of an establishment which derives at least forty percent (40%) of its gross revenue from the sale of food.

### ADDITIONAL RIGHTS AND RESPONSIBILITIES:

An applicant for a restaurant license must file a copy of its restaurant menu and Restaurant Operation Plan with the application. The Plan must include listings of all restaurant equipment and service items, the restaurant seating capacity, and other information requested by the department to substantiate that the restaurant will operate in compliance with Title 4.

The licensee must notify the Department, in advance, of any proposed changes in the seating capacity of the restaurant or dimensions of a restaurant facility.

A restaurant licensee must maintain complete restaurant services continually during the hours of selling and serving of spirituous liquor, until at least 10:00 p.m. daily, if any spirituous liquor is to be sold and served up to 2:00 a.m.

On any original applications, new managers and/or the person responsible for the day-to-day operations must attend a basic and management training class.

A licensee acting as a **RETAIL AGENT**, authorized to purchase and accept **DELIVERY** of spirituous liquor by other licensees, must receive a certificate of registration from the Department.

A **PREGNANCY WARNING SIGN** for pregnant women consuming spirituous liquor must be posted within twenty (20) feet of the cash register or behind the bar.

A log must be kept by the licensee of all persons employed at the premises including each employee's name, date and place of birth, address and responsibilities.

Bar, beer and wine bar, and restaurant licensees must pay an annual surcharge of \$20.00. The money collected from these licensees will be used by the Department for an auditor to review compliance by restaurants with the restaurant licensing provisions of ARS 4-205.02.



# FLAGSTAFF POLICE DEPARTMENT

911 SAWMILL RD • FLAGSTAFF, ARIZONA 86001 • (928) 779-3646

ADMIN FAX (928)213-3372

TDD 1-800-842-4681



Chief of Police  
Dan Musselman

## MEMORANDUM

**Memo #24-056**

**TO: Chief Musselman**

**FROM: Sgt. N. Almendarez #703**

**DATE: June 13th, 2024**

**RE: New Application – Series 12 (Restaurant) Liquor License Application– The Station Cafe**

---

On June 13th, 2024, I initiated an investigation into a new application for a Series 12 (Restaurant) liquor license filed by Douglas Carlton Sweet III (Agent and Controlling Person), This is for a new application, and the application number is 295048. It is for The Station Cafe, located at 1800 North Fort Valley Road, Flagstaff, AZ.

I conducted a query through local systems and public access on Douglas Sweet III. I discovered no derogatory records. I conducted a search for current or historical liquor violations on the business and found no violations.

I found evidence that the applicant has taken the mandatory liquor license training. This business is not located within 300 feet of a school.

A representative for the business was invited to be present for the council meeting on July 2nd, 2024.



## Planning and Development Services Memorandum

To: Stacy Fobar, Deputy City Clerk  
From: Reggie Eccleston, Code Compliance Manager  
CC: Michelle McNulty, Planning Director  
Date: June 13, 2024  
Re: Application for Liquor License #295048  
1800 N. Fort Valley Road, Flagstaff, Arizona 86001  
Assessor's Parcel Number 102-07-001A  
Douglas Carlton Sweet III on behalf of The Station Cafe

---

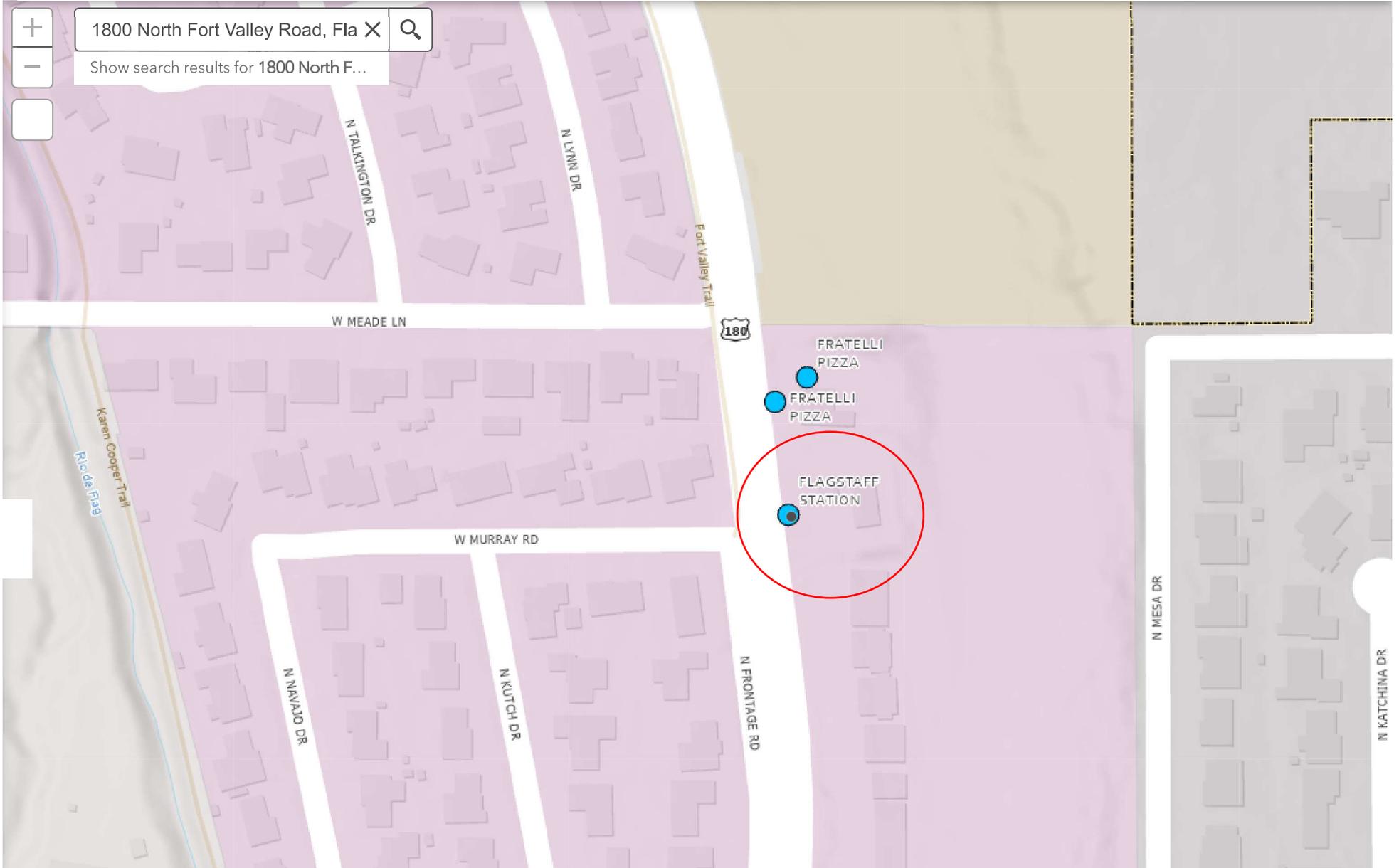
This application is a request for a new Series 12 Restaurant liquor license by Douglas Carlton Sweet III on behalf of The Station Cafe. This business is located within the Suburban Commercial district. This district does allow for this use.

There are no active Zoning Code violations associated with the applicant or the property at this time.



+ 1800 North Fort Valley Road, Fla X

- Show search results for 1800 North F...



**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Paul Mood, City Engineer  
**Co-Submitter:** Emily Markel, Purchasing Manager  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



---

**TITLE:**

**Consideration and Approval of Contract:** Approve the First Amendments to 21 Job Order Professional Contracting Services Contracts to increase project limits and annual contractor caps for the Job-Order-Contracting Program.

**STAFF RECOMMENDED ACTION:**

1. Approve the First Amendments to 21 Job Order Professional Contracting Services Contracts to increase individual project limits to \$2,000,000 and annual contractor caps to \$10,000,000 for the Job-Order-Contracting Program for each of the following contractors:
  - Horizontal Construction: Eagle Mountain Construction Co., Kinney Construction Services, Inc. Markham Contracting Co., Inc., and Tiffany Construction Co.
  - Vertical Construction: Kinney Construction Services, Inc., Loven Contracting, Inc., and Wespac Construction, Inc.
  - Water/Wastewater General Construction: KEAR Civil Corporation, PCL Construction, Inc., and Schofield Civil Construction, Inc.
  - Water/Wastewater Controls Construction: M3 Engineering and Technology Corporation and Southwest Automation Services, LLC
  - Landfill Construction: Fann Contracting Inc., Markham Contracting Co., Inc. and Rummel Construction, Inc
  - Airport Horizontal: Combs Construction Company, Inc., Fann Contracting, Inc., J. Banicki Construction, Inc.
  - Airport Vertical: FCI Constructors, Inc., Loven Contracting, Inc., Wespac Construction, Inc.
2. Authorize the City Manager to execute the necessary documents.

**Executive Summary:**

City staff administer a significant number of projects spanning a wide range in size and complexity. The City utilizes a Job-Order-Contracting Program (JOC Program) to conduct numerous, commonly encountered construction projects done quickly and easily during the short construction season. The JOC Program reduces burdensome levels of contract procurement time along with construction project procurement costs by awarding long-term contracts for a wide variety of renovation, repair, and construction projects. The Job Order Professional Contracting Services Contracts already in effect follow the Arizona Revised Statutes (A.R.S.) Title 34 expenditure limits for Job-Order-Contracting. The City's current JOC Program has an individual project limit of \$1,000,000 and caps the annual amount the City can spend on a specific contractor at \$5,000,000.

Due to rising construction costs, various City Departments have been unable to utilize the JOC Program as intended. By raising the individual project limit to \$2,000,000 and the annual amount the City can spend on a specific contractor to \$10,000,000, City staff will have more flexibility to use the JOC Program as authorized within Arizona State statute. The increased efficiency in project delivery will render project and City staff time savings that will then be utilized on other additional projects. With all non-emergency related projects, City

Staff will make its best effort to obtain pricing proposals from all JOC Program contractors in the particular discipline under which the project falls. City staff will then move forward under the overarching JOC Services Contract and require an individual JOC Construction Contract that will include the individual project's name, cost, time to completion and will require the contractors to provide bonds and insurance coverage specific to each individual project initiated under the JOC Program.

**Financial Impact:**

Costs will be expended from budgets already approved and allocated by the City Council. Awarding multiple contracts based on specific areas of qualifications and experience on an as needed basis will result in increased efficiency.

**Policy Impact:**

No impact.

**Previous Council Decision or Community Discussion:**

1. January 5, 2021, the City Council approved Job-Order-Contracting Services Contracts for JOC general City-wide projects for the following contractors:
  - Horizontal Construction: Eagle Mountain Construction Co., Kinney Construction Services, Inc. Markham Contracting Co., Inc., and Tiffany Construction Co.
  - Vertical Construction: Kinney Construction Services, Inc., Loven Contracting, Inc., and Wespac Construction, Inc.
  - Water/Wastewater General Construction: KEAR Civil Corporation, PCL Construction, Inc., and Schofield Civil Construction, Inc.
  - Water/Wastewater Controls Construction: M3 Engineering and Technology Corporation and Southwest Automation Services, LLC
  - Landfill Construction: Fann Contracting Inc., Markham Contracting Co., Inc. and Rummel Construction, Inc
  
1. April 6, 2021, the City Council approved Job-Order-Contracting Services Contracts for JOC projects at Flagstaff Pulliam Airport for the following contractors:
  - Airport Horizontal: Combs Construction Company, Inc., Fann Contracting, Inc., J. Banicki Construction, Inc.
  - Airport Vertical: FCI Constructors, Inc., Loven Contracting, Inc., Wespac Construction, Inc.

**Options and Alternatives to Recommended Action:**

1. Approve the First Amendments to 21 Job Order Professional Contracting Services Contracts to increase individual project limits to \$2,000,000 and annual contractor caps to \$10,000,000 for the JOC Program; or
2. Reject the proposed increases and maintain the individual project limit at \$1,000,000 and the annual contractor cap at \$5,000,000; or
3. Recommend alternative individual project limits and annual contractor limits to the JOC Program.

**Background and History:**

Title 34 of Arizona Revised Statute provides government entities the ability to solicit a pool of vendors who are qualified and experienced in specific construction disciplines and utilize those vendors through a JOC Program. By utilizing this solicitation method, the City is able to conduct a general solicitation for each discipline, enter into a service contract with each selected vendor that defines the scope of work for the specific discipline, and as projects arise, request that the vendor submit a "job-order" bid to perform the services and enter into individual JOC construction contracts.

In 2021, the Purchasing Section conducted solicitations for individual disciplines within the JOC Program; one

for City-wide construction services and one for Flagstaff Pulliam Airport construction services. An evaluation committee for each solicitation, including local registered contractors, evaluated the responses and selected the contractors identified above. The JOC Program has been both vital and successful in completing projects, however, rising construction costs have limited its usefulness over the past few years due to the relatively low project and annual limits. By approving the First Amendments, the increased individual and annual JOC limits will:

- Save a considerable amount of staff time in contracting for smaller capital, maintenance, and repair projects;
- Maximize the accomplishment of the large number of projects needed during Flagstaff's small construction season window, minimizing the number of winter shutdowns needed;
- Save the City the cost of multiple solicitation advertisements and staff time as well as the related soft dollar (indirect overhead) costs of conducting a formal solicitation process for each separate project.

City staff will be able to properly utilize the JOC Program and increase efficiency when delivering projects, such as construction on facilities and infrastructure (e.g., roadways, the Airport and FUTS trails).

#### **Connection to PBB Priorities and Objectives:**

##### **Safe & Healthy Community:**

- Ensure the built environment is safe through the use of consistent standards, rules & regulations, & land use practices
- Promote physical health through providing recreation opportunities, parks, open space & multiple transportation options.

##### **Inclusive & Engaged Community:**

- Ensure City facilities, services, & programs are accessible for all residents & representative of Flagstaff's diverse community

##### **Sustainable, Innovative Infrastructure:**

- Deliver outstanding services to residents through a healthy, well maintained infrastructure system.
- Promote physical health through providing recreation opportunities, parks, open space & multiple transportation options.

#### **Connection to Regional Plan:**

- Improve mobility and access throughout the region (T.1)
- Improve transportation safety and efficiency for all modes (T.2)
- Promote Transportation Infrastructure and services that enhance the quality of life of the communities within the region (T.4)
- Increase the availability and use of pedestrian infrastructure, including FUTS, as a critical element of a safe and livable community (T.5)
- Provide for bicycling as a safe and efficient means of transportation and recreation (T.6)
- Improve the City and County financial systems to provide for needed infrastructure development and rehabilitation, including enhancement of existing infrastructure (CD.1)
- Maintain and develop facilities to provide reliable, safe and cost-effective water, wastewater and reclaimed water services (WR2.2)

#### **Connection to Carbon Neutrality Plan:**

- Create inclusive networks for walking and biking that are continuous, attractive, safe, comprehensive, and convenient for people of all ages (DD-3)

- Reduce or remove natural gas usage in municipal buildings (FS-3)

**Connection to 10-Year Housing Plan:**

None.

**Connection to Division Specific Plan:**

None.

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**Attachments:**    First Amendment - Airport JOCs - Horizontal  
First Amendment - Airport JOCs - Vertical  
First Amendment - City-wide JOCs - Horizontal  
First Amendment - City-wide JOCs - Landfill Construction  
First Amendment - City-wide JOCs - Vertical Construction  
First Amendment - City-wide JOCs - WW Controls Construction  
First Amendment - City-wide JOCs - WW General Construction



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**HORIZONTAL CONSTRUCTION**

**Contract No.: 2021-51**

This First Amendment (“First Amendment”) to the fully executed Service Contract - Professional Service Contract for Job Order Professional Contracting Services (Contract No. 2020-100) dated May 3, 2021 (the “Initial Contract”) is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff (“Owner”), an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **Combs Construction Company, Inc.** (“Firm”), an Arizona Corporation with offices at 1903 West Parkside Lane, Suite 100, Phoenix, Arizona 85027, effective as of the date written below. The Owner and Firm shall be jointly referred to as “Parties”.

**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~strike through~~ and new text is **BOLD and ALLCAPS**.

**GENERAL**

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

Once the successful Firms are selected, a Scope of Work for each Job Order discipline may be provided by the Owner to a number of Firms to solicit competitive price proposals.

The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

\_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
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**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

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GENERAL

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**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_  
City Clerk

Approved as to form:

\_\_\_\_\_  
City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**HORIZONTAL CONSTRUCTION**

**Contract No.: 2021-51**

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**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

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**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

\_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**VERTICAL CONSTRUCTION**

**Contract No.: 2021-51**

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**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
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For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

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GENERAL

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The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

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IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_  
City Clerk

Approved as to form:

\_\_\_\_\_  
City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**VERTICAL CONSTRUCTION**

**Contract No.: 2021-51**

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**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~strike through~~ and new text is **BOLD and ALLCAPS**.

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**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

\_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_  
City Clerk

Approved as to form:

\_\_\_\_\_  
City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**VERTICAL CONSTRUCTION**

**Contract No.: 2021-51**

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**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
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For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

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**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_  
City Clerk

Approved as to form:

\_\_\_\_\_  
City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**HORIZONTAL CONSTRUCTION**

**Contract No.: 2020-100**

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**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

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The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_  
City Clerk

Approved as to form:

\_\_\_\_\_  
City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
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**HORIZONTAL CONSTRUCTION**

**Contract No.: 2020-100**

This First Amendment (“First Amendment”) to the fully executed Service Contract - Professional Service Contract for Job Order Professional Contracting Services (Contract No. 2020-100) dated January 29, 2021 (the “Initial Contract”) is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff (“Owner”), an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **Kinney Construction Services, Inc.** (“Firm”), an Arizona Corporation with offices at 121 E. Birch Ave., Flagstaff, AZ 86001, effective as of the date written below. The Owner and Firm shall be jointly referred to as “Parties”.

**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~striketrough~~ and new text is **BOLD and ALLCAPS**.

**GENERAL**

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

Once the successful Firms are selected, a Scope of Work for each Job Order discipline may be provided by the Owner to a number of Firms to solicit competitive price proposals.

The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

\_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**HORIZONTAL CONSTRUCTION**

**Contract No.: 2020-100**

This First Amendment (“First Amendment”) to the fully executed Service Contract - Professional Service Contract for Job Order Professional Contracting Services (Contract No. 2020-100) dated January 29, 2021 (the “Initial Contract”) is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff (“Owner”), an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **Markham Contracting Co., Inc.** (“Firm”), an Arizona Corporation with offices at 22820 N. 19<sup>th</sup> Ave., Phoenix, AZ 85027, effective as of the date written below. The Owner and Firm shall be jointly referred to as “Parties”.

**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~strike through~~ and new text is **BOLD and ALLCAPS**.

**GENERAL**

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

Once the successful Firms are selected, a Scope of Work for each Job Order discipline may be provided by the Owner to a number of Firms to solicit competitive price proposals.

The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_  
City Clerk

Approved as to form:

\_\_\_\_\_  
City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**HORIZONTAL CONSTRUCTION**

**Contract No.: 2020-100**

This First Amendment (“First Amendment”) to the fully executed Service Contract - Professional Service Contract for Job Order Professional Contracting Services (Contract No. 2020-100) dated January 29, 2021 (the “Initial Contract”) is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff (“Owner”), an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **Tiffany Construction Company** (“Firm”), an Arizona Corporation with offices at 7122 N. 27th Ave., Phoenix, AZ 85051, effective as of the date written below. The Owner and Firm shall be jointly referred to as “Parties”.

**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~strike through~~ and new text is **BOLD and ALLCAPS**.

**GENERAL**

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

Once the successful Firms are selected, a Scope of Work for each Job Order discipline may be provided by the Owner to a number of Firms to solicit competitive price proposals.

The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_  
City Clerk

Approved as to form:

\_\_\_\_\_  
City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**LANDFILL CONSTRUCTION**

**Contract No.: 2020-100**

This First Amendment (“First Amendment”) to the fully executed Service Contract - Professional Service Contract for Job Order Professional Contracting Services (Contract No. 2020-100) dated January 29, 2021 (the “Initial Contract”) is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff (“Owner”), an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **Fann Contracting, Inc.** (“Firm”), an Arizona Corporation with offices at 6725 Generation Lane, Prescott, AZ 86301, effective as of the date written below. The Owner and Firm shall be jointly referred to as “Parties”.

**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~strike through~~ and new text is **BOLD and ALLCAPS**.

**GENERAL**

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

Once the successful Firms are selected, a Scope of Work for each Job Order discipline may be provided by the Owner to a number of Firms to solicit competitive price proposals.

The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_  
City Clerk

Approved as to form:

\_\_\_\_\_  
City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**LANDFILL CONSTRUCTION**

**Contract No.: 2020-100**

This First Amendment (“First Amendment”) to the fully executed Service Contract - Professional Service Contract for Job Order Professional Contracting Services (Contract No. 2020-100) dated January 29, 2021 (the “Initial Contract”) is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff (“Owner”), an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **Markham Contracting Co., Inc.** (“Firm”), an Arizona Corporation with offices at 22820 N. 19<sup>th</sup> Ave., Phoenix, AZ 85027, effective as of the date written below. The Owner and Firm shall be jointly referred to as “Parties”.

**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~strike through~~ and new text is **BOLD and ALLCAPS**.

GENERAL

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

Once the successful Firms are selected, a Scope of Work for each Job Order discipline may be provided by the Owner to a number of Firms to solicit competitive price proposals.

The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

\_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**LANDFILL CONSTRUCTION**

**Contract No.: 2020-100**

This First Amendment (“First Amendment”) to the fully executed Service Contract - Professional Service Contract for Job Order Professional Contracting Services (Contract No. 2020-100) dated January 29, 2021 (the “Initial Contract”) is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff (“Owner”), an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **Rummel Construction, Inc.** (“Firm”), an Arizona Corporation with offices at 7520 E. Adobe Dr., Scottsdale, AZ 85255, effective as of the date written below. The Owner and Firm shall be jointly referred to as “Parties”.

**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~strike through~~ and new text is **BOLD and ALLCAPS**.

**GENERAL**

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

Once the successful Firms are selected, a Scope of Work for each Job Order discipline may be provided by the Owner to a number of Firms to solicit competitive price proposals.

The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

\_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**VERTICAL CONSTRUCTION**

**Contract No.: 2020-100**

This First Amendment (“First Amendment”) to the fully executed Service Contract - Professional Service Contract for Job Order Professional Contracting Services (Contract No. 2020-100) dated January 29, 2021 (the “Initial Contract”) is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff (“Owner”), an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **Kinney Construction Services, Inc.** (“Firm”), an Arizona Corporation with offices at 121 E. Birch Ave., Flagstaff, AZ 86001, effective as of the date written below. The Owner and Firm shall be jointly referred to as “Parties”.

**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~striketrough~~ and new text is **BOLD and ALLCAPS**.

**GENERAL**

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

Once the successful Firms are selected, a Scope of Work for each Job Order discipline may be provided by the Owner to a number of Firms to solicit competitive price proposals.

The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

\_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_  
City Clerk

Approved as to form:

\_\_\_\_\_  
City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**VERTICAL CONSTRUCTION**

**Contract No.: 2020-100**

This First Amendment (“First Amendment”) to the fully executed Service Contract - Professional Service Contract for Job Order Professional Contracting Services (Contract No. 2020-100) dated January 29, 2021 (the “Initial Contract”) is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff (“Owner”), an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **Loven Contracting, Inc.** (“Firm”), an Arizona Corporation with offices at 1100 South Pinnacle Street, Flagstaff, AZ 86001, effective as of the date written below. The Owner and Firm shall be jointly referred to as “Parties”.

**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~strike through~~ and new text is **BOLD and ALLCAPS**.

GENERAL

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

Once the successful Firms are selected, a Scope of Work for each Job Order discipline may be provided by the Owner to a number of Firms to solicit competitive price proposals.

The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

\_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**VERTICAL CONSTRUCTION**

**Contract No.: 2020-100**

This First Amendment (“First Amendment”) to the fully executed Service Contract - Professional Service Contract for Job Order Professional Contracting Services (Contract No. 2020-100) dated January 29, 2021 (the “Initial Contract”) is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff (“Owner”), an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **Wespac Construction, Inc.** (“Firm”), an Arizona Corporation with offices at 345 S. River Run, Flagstaff, AZ 86001, effective as of the date written below. The Owner and Firm shall be jointly referred to as “Parties”.

**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~striketrough~~ and new text is **BOLD and ALLCAPS**.

**GENERAL**

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

Once the successful Firms are selected, a Scope of Work for each Job Order discipline may be provided by the Owner to a number of Firms to solicit competitive price proposals.

The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

\_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**WATER/WASTEWATER CONTROLS CONSTRUCTION**

**Contract No.: 2020-100**

This First Amendment ("First Amendment") to the fully executed Service Contract - Professional Service Contract for Job Order Professional Contracting Services (Contract No. 2020-100) dated January 29, 2021 (the "Initial Contract") is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff ("Owner"), an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **M3 Engineering & Technology Corporation** ("Firm"), an Arizona Corporation with offices at 2175 West Pecos Road, Suite 3, Chandler, AZ 85224, effective as of the date written below. The Owner and Firm shall be jointly referred to as "Parties".

**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~strike through~~ and new text is **BOLD and ALLCAPS**.

GENERAL

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

Once the successful Firms are selected, a Scope of Work for each Job Order discipline may be provided by the Owner to a number of Firms to solicit competitive price proposals.

The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

\_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**WATER/WASTEWATER CONTROLS CONSTRUCTION**

**Contract No.: 2020-100**

This First Amendment (“First Amendment”) to the fully executed Service Contract - Professional Service Contract for Job Order Professional Contracting Services (Contract No. 2020-100) dated January 29, 2021 (the “Initial Contract”) is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff (“Owner”), an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **Southwest Automation Services, LLC** (“Firm”), an Arizona Limited Liability Company with offices at 8623 W. Melinda Lane, Peoria, AZ 85382, effective as of the date written below. The Owner and Firm shall be jointly referred to as “Parties”.

**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~strike through~~ and new text is **BOLD and ALLCAPS**.

GENERAL

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

Once the successful Firms are selected, a Scope of Work for each Job Order discipline may be provided by the Owner to a number of Firms to solicit competitive price proposals.

The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

\_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**WATER/WASTEWATER GENERAL CONSTRUCTION**

**Contract No.: 2020-100**

This First Amendment (“First Amendment”) to the fully executed Service Contract - Professional Service Contract for Job Order Professional Contracting Services (Contract No. 2020-100) dated January 29, 2021 (the “Initial Contract”) is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff (“Owner”), an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **KEAR Civil Corporation** (“Firm”), an Arizona Corporation with offices at 3100 N. Caden Ct., Flagstaff, AZ 86004, effective as of the date written below. The Owner and Firm shall be jointly referred to as “Parties”.

**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~striketrough~~ and new text is **BOLD and ALLCAPS**.

GENERAL

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

Once the successful Firms are selected, a Scope of Work for each Job Order discipline may be provided by the Owner to a number of Firms to solicit competitive price proposals.

The maximum cost per Job Order is ~~\$1,000,000~~ **\$2,000,000**. The annual cap per Firm is ~~\$5,000,000~~ **\$10,000,000**.

All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_  
City Clerk

Approved as to form:

\_\_\_\_\_  
City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
**WATER/WASTEWATER GENERAL CONSTRUCTION**

**Contract No.: 2020-100**

This First Amendment (“First Amendment”) to the fully executed Service Contract - Professional Service Contract for Job Order Professional Contracting Services (Contract No. 2020-100) dated January 29, 2021 (the “Initial Contract”) is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff (“Owner”), an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **PCL Construction, Inc.** (“Firm”), a Colorado Corporation with offices at 1711 West Greentree Drive, Suite 201, Tempe AZ 85284, effective as of the date written below. The Owner and Firm shall be jointly referred to as “Parties”.

**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~strike through~~ and new text is **BOLD and ALLCAPS**.

**GENERAL**

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

Once the successful Firms are selected, a Scope of Work for each Job Order discipline may be provided by the Owner to a number of Firms to solicit competitive price proposals.

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All other provisions of the Initial Contract shall remain unchanged in full force and effect.

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed by their duly authorized representatives as of the date first written above. This First Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

\_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney



**FIRST AMENDMENT**  
**PROFESSIONAL SERVICE CONTRACT**  
**FOR**  
**JOB ORDER PROFESSIONAL CONTRACTING SERVICES:**  
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**RECITALS**

- A. Arizona Revised Statutes § 34-605 et seq. authorizes job-order-contracting construction services which allow expediency for project delivery while providing the best value to the City; and
- B. The City is authorized by statute to increase the maximum cost per job order and maximum annual cap per Firm to allow continued flexibility in project delivery.

For the reasons recited above, and in consideration of the mutual covenants contained herein, the Parties agree that the maximum cost per job order and maximum annual cap per Firm in the Scope of Work (Exhibit A) to the Initial Contract is amended as follows.

Deleted text has a ~~strike through~~ and new text is **BOLD and ALLCAPS**.

**GENERAL**

A Job Order Contract (JOC) is an indefinite quantity contract pursuant to which the Firm will perform an ongoing series of individual projects (Job Orders) at different locations, often simultaneously, throughout the City of Flagstaff.

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**City of Flagstaff**

**Firm**

By: \_\_\_\_\_  
Greg Clifton, City Manager

\_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_  
City Clerk

Approved as to form:

\_\_\_\_\_  
City Attorney

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Jessica Cortes, Court Administrator  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



---

**TITLE:**

**Consideration of Appointments:** Magistrate and On-Call Magistrates for the Flagstaff Municipal Court.

**STAFF RECOMMENDED ACTION:**

Approve the appointments of Honorable James Speed and On-Call Magistrates Charles Adornetto, Staci Foulks and Roberta McVickers to the Flagstaff Municipal Court

**Executive Summary:**

Appointment of all magistrates is required to be completed by the Flagstaff City Council for a two-year term under both the City Charter and FCC Section 1-15-001-0002(A). Appointment of Magistrates for the Municipal Court allows for ongoing operations of the court without interruption.

Magistrates hear criminal, civil, traffic and local code violations that are filed in the Flagstaff Municipal Court. They conduct trials, both jury and non-jury, and sentence individuals within the parameters set by law. Magistrates are required for the ongoing operational needs of the Municipal Court. Magistrates are critical to the criminal and civil processes of the judicial branch.

**Financial Impact:**

Funding for all judicial positions is included in the approved budget of the Flagstaff Municipal Court, account numbers 001-01-016-0066-1-4101 through 001-01-016-0066-1-4161.

**Policy Impact:**

Magistrates and On-Call Magistrates are critical to the criminal and civil processes of the judicial branch. These appointments help maintain an independent judiciary that is necessary for the ongoing operations of our local government. A strong, independent, and fair judicial branch provides balance to criminal and civil matters that require resolution within our municipality.

**Previous Council Decision or Community Discussion:**

The Magistrate and On-Call Magistrates have been appointed by previous City Councils and have served in the Flagstaff Municipal Court and have been serving in the Flagstaff Municipal Court between two and eight years.

**Options and Alternatives to Recommended Action:**

1. Approve the appointments.
2. Do not approve the appointments and request alternative candidates for Council consideration.

**Connection to PBB Priorities and Objectives:**

**Priority Based Budget Key Community Priorities and Objectives**

Personnel - Attract and retain quality staff.

**Connection to Regional Plan:**

None.

**Connection to Carbon Neutrality Plan:**

None.

**Connection to 10-Year Housing Plan:**

None.

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**Attachments:**

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Katie Brandis, Dispatch Supervisor  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



---

**TITLE:**

**Consideration and Approval of Contract:** Arizona 911 Grant Agreement between Arizona Department of Administration Office of Grants and Federal Resources and the City of Flagstaff acting as System Administrator for Coconino County.

**STAFF RECOMMENDED ACTION:**

Approve the acceptance of the grant from the Arizona Department of Administration Office of Grants and Federal Resources in the amount of \$524,958.00 for the 911 budget for Coconino County FY2025.

**Executive Summary:**

Flagstaff Police Department acting as the 9-1-1 System Administrator for the Coconino County Public Safety Answering Points (PSAPs) was awarded \$524,958.00 in grant funds from the Arizona Department of Administration Office of Grants and Federal Resources. This grant funds all operational costs of the 9-1-1 telephone systems for the PSAPs in Coconino County which includes: Flagstaff Police Department, Williams Police Department, Page Police Department, Grand Canyon National Park Service, and Glen Canyon National Park Service.

**Financial Impact:**

Project Name: FY2025 Coconino County 9-1-1 Grant  
Cost: \$524,958.00.00  
Account Number Budgeted:001-04-062-6246-2-4211  
FY Budgeted Amount: \$524,958.00  
Grant Funded: 100% funded by the State 9-1-1 Office  
Funding Source: Reimbursement

**Policy Impact:**

None.

**Previous Council Decision or Community Discussion:**

Council has approved the 9-1-1 grant each year since 2019.

**Options and Alternatives to Recommended Action:**

Approve the acceptance of the grant or decline the acceptance of the grant.

**Background and History:**

Flagstaff Police Department has been designated the System Administrator for Coconino County by the State 9-1-1 Office. The System Administrator is responsible for submitting 9-1-1 operating bills to the State 9-1-1 Office, and submitting call statistics and required reports for all the PSAPs in their county. Historically the 911 telephone bills would be mailed to the Flagstaff Police Department. The 911 Coordinator would make sure the

charges on the bill were correct and send the bill and an authorization letter to the State 911 Office. In turn, they would pay the bills with the money collected through the Emergency Telecommunication Service Revolving Fund. In 2018, the Arizona 911 Office was moved under the direction of the Arizona Department of Administration of Grants and Federal Resources. With this change, the Arizona Department of Administration Grants and Federal Resources Office created a grant program for the yearly 9-1-1 budget. System Administrators have to apply yearly for the funds to pay the 9-1-1 system bills. This allows the PSAPs to be responsible for their bills and to be reimbursed through the grant award by the State. The process makes sure funds are distributed fairly across the state. The City of Flagstaff has Intergovernmental Agreements (IGA's) with the City of Williams, City of Page, Grand Canyon National Park and Glen Canyon National Park that are valid until 2027. These agreements ensure that if the State 9-1-1 Office was to no longer fund the 9-1-1 system each agency would be responsible for their own costs.

**Connection to PBB Priorities and Objectives:**

High Performance Governance and Safe and Healthy Community; Provide public safety services with resources, staff, and training responsive to the community's needs.

**Connection to Regional Plan:**

Goal PF.3. Provide high-quality emergency response and public safety services including law enforcement, fire, medical and ambulance transport service.

**Connection to Carbon Neutrality Plan:**

Health and Safety HS-3

**Connection to 10-Year Housing Plan:**

N/A

**Connection to Division Specific Plan:**

N/A

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**Attachments:**    [FY2025 9-1-1 Grant](#)

ARIZONA DEPARTMENT OF ADMINISTRATION  
ARIZONA 9-1-1 PROGRAM  
GRANT AGREEMENT

Grant Number: **ADOA-AZ911-25-05**

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This Grant Agreement (“**Agreement**”) is between City of Flagstaff, acting as System Administrator, (“**Grantee**”), participating and the State of Arizona, acting through the Arizona Department of Administration (“**ADOA**”), (sometimes, individually, a “**Party**,” or collectively, “**Parties**”).

**AUTHORIZATION**

1. A.R.S § 41-704 authorizes the Arizona Department of Administration to administer the emergency telecommunication services revolving fund in accordance with A.R.S. 11-951; 11-952 and 41-101.01.

**BACKGROUND**

2. The Arizona 9-1-1 Grant Program is designed to assist Public Safety Answering Points (PSAPs), in collaboration with regional and local jurisdictions, perform activities related to implementation and operation of their respective emergency telecommunication system.

**PURPOSE OF THE AGREEMENT**

3. Distribution of funding per A.R.S § 41-704, which establishes the administration of the emergency telecommunication services revolving fund.

**TERM, EFFECTIVE DATE, AND Termination**

4. Term and Effective Date: This Agreement will commence on July 1, 2024 and terminate on June 30, 2025. This agreement expires at the end of the award period unless prior written approval for an extension has been obtained by ADOA. A request for an extension must be received by ADOA, sixty (60) days prior to the end of the award period. ADOA in its sole discretion may approve an extension to further the goals and objectives of the program, and determine the length of any extension.

**OBLIGATIONS OF THE PARTIES**

5. Responsibilities of the Grantee:
  - 5.1. Grantee agrees that grant funds will be used in accordance with the approved application, applicable statutes, program rules, guidelines and special conditions. ADOA supports the use of these funds in accordance with the ARS § 41-704 for activities such as:
    - 5.1.1. Adoption and operation of Next Generation 9-1-1 (NG9-1-1) services and applications, including monthly recurring costs for 9-1-1 equipment, network, maintenance, and hardware and software support
    - 5.1.2. Facilitate the migration of the State’s PSAPs to the Next Generation of 9-1-1 capability
    - 5.1.3. Migration to an Emergency Services IP-enabled (ESINet) network
    - 5.1.4. Solutions that meet or exceed the National Emergency Number Association (NENA), Federal Communications Commission (FCC), international, and industry standards or requirements.
    - 5.1.5. The National Emergency Number Association (NENA) defines NG9-1-1 as: “An Internet Protocol (IP) based system comprised of managed Emergency Services IP networks (ESInets), functional elements (applications), and databases that replicate traditional E9-1-1 features and functions and provides additional capabilities. NG9-1-1 is designed to provide access to emergency services from all connected

communications sources, and provide multimedia data capabilities for Public Safety Answering Points (PSAPs) and other emergency services organizations.”

- 5.2. Grantee agrees that the following activities will be reimbursed only through Administrative Cost and subject to the aggregate limitation on such costs:
  - 5.2.1. Personnel. Costs associated with administrative oversight of managing local contracts and technical support. Costs associated with GIS coordinator, if it is an employee of the System Administrator’s agency.
  - 5.2.2. Fringe Benefits. Employee related expenses associated with administrative oversight of managing local contracts and/or GIS coordinator.
  - 5.2.3. Travel. Travel requests for training, conferences, etc. related to System Administrator and/or GIS coordinator functions. Travel costs will only be reimbursed based on the State rate per diem identified in SAAM 50.
  - 5.2.4. Supplies. Costs associated with supplies related to System Administration functions.
  - 5.2.5. Other Costs. Training or education assistance related to System Administration and/or GIS coordinator functions.
- 5.3. Grantee agrees that it will submit financial and activity reports to ADOA in a format provided by ADOA, documenting the activities supported by these grant funds and providing an assessment of the impact of these activities which may include documentation of project milestones. In the event reports are not received on or before the indicated date(s), funding may be suspended until such time as delinquent report(s) are received.
- 5.4. Grantee understands that financial reports are required as an accounting of expenditures for either reimbursement or ADOA-approved payments. Reports are due pursuant to the schedule listed in this agreement.
- 5.5. Grantee agrees to pay vendors in a timely manner on behalf of the PSAPs in their jurisdictions. Late fees on invoices will not be reimbursed by ADOA.
- 5.6. The final request for reimbursement of grant funds must be received by ADOA no later than forty-five (45) days after the last day of the award period.
- 5.7. All goods and services must be received or have reasonable expectations thereof and placed in service by Grantee by the expiration of this award.
- 5.8. Grantee agrees to remit all unexpended grant funds to ADOA within thirty (30) days of written request received from ADOA.
- 5.9. Grantee agrees that all encumbered funds must be expended and that goods and services must be paid within forty-five (45) days of expiration of this award.
- 5.10. Grantee agrees to cooperate and participate with any and all assessments, evaluation efforts or information and data collection requests, and acknowledges that the State grantor agency has the right to obtain, reproduce, publish, or use data provided under this award in accordance with applicable statutes, rules, and guidelines.
- 5.11. Grantee understands that grant funds may not be released until Grantee is compliant with all requirements of grant agreement.

5.12. Required activity and financial reports are submitted according to the following schedule(s):

<b>ACTIVITY REPORTS</b>			
<b>Report Due:</b>		<b>Due Date:</b>	
GIS Data Submissions		Quarter 1 September 30, 2024	
		Quarter 2 December 31, 2024	
		Quarter 3 March 31st, 2025	
		Quarter 4 June 30th, 2025	
<b>FINANCIAL REPORTS</b>			
<b>Report Period:</b>	<b>Due Date:</b>	<b>Report Period:</b>	<b>Due Date:</b>
July 1 – July 31	August 25	January 1 – January 31	February 25
August 1 – August 31	September 25	February 1 – February 29	March 25
September 1 – September 30	October 25	March 1 – March 31	April 25
October 1 – October 31	November 25	April 1 – April 30	May 25
November 1 – November 30	December 25	May 1 – May 31	June 25
December 1 – December 31	January 25	June 1 – June 30	July 25

\*More frequent reports may be required for GRANTEES who are considered high risk.

6. Responsibilities of the State:

- 6.1. It is agreed and understood that the total to be paid by ADOA under this Agreement shall not exceed **\$524,958** in state funds.
- 6.2. Once the financial reimbursement request is approved by ADOA, payment to Grantee will be completed within 5 business days.
- 6.3.

<b>APPROVED LINE ITEM PROGRAM BUDGET</b>	
Personnel	<b>\$0.00</b>
Fringe Benefits	<b>\$0.00</b>
Travel	<b>\$0.00</b>
Equipment	<b>\$0.00</b>
Supplies	<b>\$0.00</b>
Contractual/Outside Services	<b>\$516,336</b>
Construction	<b>\$0.00</b>

Other Costs	\$8,622
<b>Total</b>	<b>\$524,958</b>

## UNIFORM TERMS AND CONDITIONS

### 7. Grant Administration and Operation

7.1. Records. Under A.R.S. § 35-214 and § 35-215, the Grantee shall retain any and all Data and other “records” relating to the acquisition and performance of the agreement for a period of five (5) years after the completion of the award. All records shall be subject to inspection and audit by the State at reasonable times. Upon request, the grantee shall produce a legible copy of any or all such records.

7.2. Non-Discrimination. The grantee shall comply with State Executive Orders No. 2023-01, 2009-09, and any and all other applicable Federal and State laws, rules and regulations, including the Americans with Disabilities Act.

7.3. Audit. Pursuant to A.R.S. § 35-214, at any time during the term of this agreement and five (5) years thereafter, the grantee’s books and records shall be subject to audit by the State and, where applicable, the Federal Government, to the extent that the books and records relate to the performance of the agreement.

7.4. Facilities Inspection and Materials Testing. The grantee agrees to permit access to its facilities, and the grantee’s processes or services, at reasonable times for inspection of the facilities or Materials covered under this award as required under A.R.S. § 41-2547. The State shall also have the right to test, at its own cost, the Materials to be supplied under this award. Neither inspection of the grantees facilities nor Materials testing shall constitute final acceptance of the Materials or Services.

7.5. Advertising, Publishing and Promotion of Award. The grantee shall not use, advertise or promote information for commercial benefit concerning this award without the prior written approval of the Grants Administrator.

8. Federal Immigration and Nationality Act. Grantee shall comply with all federal, state and local immigration laws and regulations relating to the immigration status of their employees during the term of the award. The State shall retain the right to perform random audits of grantee records or to inspect papers of any employee thereof to ensure compliance. Should the State determine that the grantee be found noncompliant, the State may pursue all remedies allowed by law, including, but not limited to: suspension of work, termination of the award for default and suspension.

9. E-Verify Requirements. In accordance with A.R.S. § 41-4401, grantee warrants compliance with all Federal immigration laws and regulations relating to employees and warrants its compliance with Section A.R.S. § 23- 214, Subsection A.

10. Availability of Funds for the Current State Fiscal Year. Should the State Legislature enter back into session and reduce the appropriations or for any reason and these Materials or Services are not funded, the State may take any of the following actions:

10.1.1. Accept a decrease in award offered to the grantee;

10.1.2. Cancel the award; or

10.1.3. Cancel the award and re-solicit the requirements.

11. Personnel. Grantee warrants that its personnel will perform their duties under the agreement in a professional manner, applying the requisite skills and knowledge, consistent with industry standards, and in accordance with the requirements of the award. Grantee further warrants that its key personnel will maintain any and all certifications relevant to their work, and grantee shall provide individual evidence of certification to State’s authorized representatives upon request.

12. False Statements. Grantee represents and warrants that all statements and information grantee prepared and submitted in response to the Solicitation or as part of the grantee documents are current, complete, true, and accurate. If the Grants Administrator determines that grantee submitted an application with a false statement, or makes material misrepresentations during the performance of the award, the Grants Administrator may determine that grantee has materially breached the agreement and may void the submitted application and any resulting agreement.
13. Agreement Termination
  - 13.1. Cancellation for Conflict of Interest. Pursuant to A.R.S. § 38-511, the State may cancel this agreement within three (3) years after agreement execution without penalty or further obligation if any person significantly involved in initiating, negotiating, securing, drafting or creating the agreement on behalf of the State is or becomes at any time while the agreement or an extension of the agreement is in effect an employee of or a consultant to any other party to this agreement with respect to the subject matter of the agreement. The cancellation shall be effective when the grantee receives written notice of the cancellation unless the notice specifies a later time. If the grantee is a political subdivision of the State, it may also cancel this award as provided in A.R.S. § 38-511.
  - 13.2. Termination for Convenience. The State reserves the right to terminate the agreement, in whole or in part at any time when in the best interest of the State, without penalty or recourse. Upon receipt of the written notice, the grantee shall stop all work, as directed in the notice, notify all contractors of the effective date of the termination and minimize all further costs to the State. The grantee shall be entitled to receive just and equitable compensation for work in progress, work completed, and Materials or Services accepted before the effective date of the termination. The cost principles and procedures provided in A.R.S. § 41-2543 and A.A.C. Title 2, Chapter 7, Article 7, shall apply.
14. Agreement Claims. All agreement claims or controversies under this agreement shall be resolved according to A.R.S. Title 41, Chapter 23, Article 9, and rules adopted thereunder.
15. Arbitration. The parties to this agreement agree to resolve all disputes arising out of or relating to this agreement through arbitration, after exhausting applicable administrative review, to the extent required by A.R.S. § 12-1518, except as may be required by other applicable statutes (A.R.S. Title 41).
16. This Agreement does not imply authority to perform any tasks or accept any responsibility not expressly stated in this Agreement.
17. This Agreement does not create a duty or responsibility unless the intention to do so is clearly and unambiguously stated in this Agreement. This Agreement shall not relieve the Parties of any obligation or responsibility imposed on it by law.
18. This Agreement contains the entire agreement of the Parties with respect to its subject matter and supersedes all prior and contemporaneous agreements, understandings, and inducements, whether express or implied, oral or written.
19. Any change, modification, or extension of this Agreement must be submitted through ADOA's online grant management system, eCivis, and approved by ADOA.
20. This Agreement has been arrived at by negotiation and shall not be construed for or against any Party.
21. The failure of either Party to insist in any one or more instances upon the full and complete performance of any of the terms and provisions of this Agreement to be performed by the other Party or to take any action permitted by this Agreement shall not be construed as a waiver or relinquishment of the right to insist upon full and complete performance of the same or any other covenant or condition either in the past or in the future. The acceptance by either Party of sums less than may be due and owing at any time shall not be construed as an accord and satisfaction.
22. The substantive laws of Arizona (without reference to any choice of law principles) shall govern the interpretation, validity, performance and enforcement of this Agreement. The Parties further agree to cooperate in all ways

reasonable and necessary to comply with the applicable statutes, including amending this Agreement as needed in the future and making any refunds or payments that might be required to bring the Parties into full compliance with applicable law.

23. Nothing in this Agreement is intended to create any third-party beneficiary rights; and the State and the Grantee expressly state that this Agreement does not create any third-party rights of enforcement.
24. This Agreement may be executed in any number of counterparts, all such counterparts shall be deemed to constitute one and the same instrument, and each of said counterparts shall be deemed an original hereof.
25. If the last day of any time stated herein shall fall on a Saturday, Sunday, or legal holiday in the State of Arizona, then the duration of such time shall be extended so that it shall end on the next succeeding day which is not a Saturday, Sunday, or legal holiday.
26. Except as expressly provided herein, no Party may delegate or assign its rights or responsibilities under this Agreement without prior written approval of the other Party and any purported assignment or delegation in violation of this provision shall be void.
27. The Parties to this Agreement agree to resolve all disputes arising out of or relating to this Agreement through arbitration, after exhausting applicable administrative review, to the extent required by A.R.S. § 12-1518, except as may be required by other applicable statutes.
28. If any provision of this Agreement is held invalid, the remainder of the Agreement shall not be affected thereby and all other parts of this Agreement shall be in full force and effect.
29. Any deviation or failure to comply with the purpose and/or conditions of this Agreement without prior approval may constitute sufficient reason for ADOA to terminate this Agreement, revoke the grant, require the return of all unspent funds, perform an audit of expended funds, and require the return of any previously spent funds which are deemed to have been spent in violation of the purpose or conditions of this grant.
30. All notices required or permitted under this Agreement shall be given in writing and addressed as follows:

A. If to the Arizona 9-1-1 Program:

Arizona Department of Administration  
Arizona 9-1-1 Program  
100 North 15<sup>th</sup> Avenue, Suite 302  
Phoenix, AZ 85007  
Attention: Arizona 9-1-1 Program

B. If to the GRANTEE:

Flagstaff Police Department  
911 E Sawmill Rd  
Flagstaff, AZ 86001  
ATTENTION: Katie Brandis

Arizona Department of Administration  
**Arizona 9-1-1 Program**

**GRANT AGREEMENT CONTINUATION SHEET  
SPECIAL CONDITION(S)**

1. GRANTEE must submit a current service plan to ADOA. If a service plan is not complete, a letter requesting an extension with an estimated completion date must be submitted for approval before financial reimbursements will be made.
2. GRANTEE must submit copies of executed Memorandum of Understandings (MOUs) between each System's PSAP and the System Administrator before financial reimbursements will be made.
3. GRANTEE must notify ADOA within 10 days if the GRANTEE is unable to perform the function of System Administrator on behalf of PSAPs in their jurisdiction. Administrative funds may be reduced to the System Administrator if ADOA assumes responsibility of the duties under this agreement.
4. GRANTEE must enroll in automatic clearinghouse payments. Grantee must complete the document titled "State of Arizona Substitute W-9 and ACH Vendor Authorization Forms & Instructions. Vendor account set-up and payment information can be found at: <https://gao.az.gov>
5. GRANTEE agrees to share GIS data, at minimum, once per quarter (4) times per fiscal year upon request from ADOA, Arizona 9-1-1 Program, in order to support ongoing statewide initiatives. Data shared will not be distributed for commercial use and is pursuant to A.R.S. § 37-178.
6. GRANTEE agrees to allow ADOA to deploy a data analytic tool provided by the Arizona 9-1-1 Program and work with all PSAPs within their 9-1-1 System and the Arizona 9-1-1 Program during implementation.
7. GRANTEE agrees to work with all PSAPs within their 9-1-1 System and the Arizona 9-1-1 Program to implement text-to-9-1-1 service.

IN WITNESS WHEREOF, the parties have made and executed the Agreement the day and year first above written.  
**FOR GRANTEE:**

---

Authorized Signatory Date

---

Printed Name and Title

---

Additional signature(s) if required by political subdivision Date

---

Printed Name and Title Date

**FOR ARIZONA DEPARTMENT OF ADMINISTRATION:**

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Arizona 9-1-1 Program Date  
Arizona Department of Administration

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Mac McNamara, Water Services Section Director  
**Co-Submitter:** Shannon Jones  
**Co-Submitter:** Shannon Jones  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



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**TITLE:**

**Consideration and Approval of Contract:** Professional services contract for the Wastewater Treatment Facilities Master Plan in the amount of \$792,160.

**STAFF RECOMMENDED ACTION:**

1. Approve the Professional Services Contract with Hazen and Sawyer for the completion of the Treatment Facilities Master Plan in the amount of \$792,160.
2. Authorize the City Manager to execute the necessary documents.

**Executive Summary:**

This contract will allow for engineering services in the development of the City's Treatment Facilities Master Plan to address near and long-term management of wastewater and biosolids produced at the Rio de Flag Water Reclamation Facility (RDFWRF) and the Wildcat Hill Water Reclamation Facility (WHWRF).

**Financial Impact:**

Project Name: Wastewater Treatment Facilities Master Plan  
Cost: \$792,160.00  
Account Number Budgeted: 203-08-375-3564-0-4421  
FY Budgeted Amount: \$746,231.00  
Account Number Budgeted: 203-08-375-3235-0-4466  
FY Budgeted Amount: \$265,000.00  
Grant Funded: N/A  
Funding Source: Wastewater Fund

**Policy Impact:**

No policy impact

**Previous Council Decision or Community Discussion:**

Council had previously approved the FY 2024 and 2025 Capital Improvement 5-Year Plan and authorized the FY 2024 and FY 2025 budget for this project.

**Options and Alternatives to Recommended Action:**

1. Approve the Professional Services Contract Contract No.: 2024-40 in the amount of \$792,160.00 as recommended; or
2. Reject the award and provide additional direction to Staff. This option would delay the start of the Wastewater Treatment Facilities Master Plan.

**Background and History:**

Purchasing staff posted a Request for Statement of Qualifications (RSOQ) solicitation for engineering professional services to the City of Flagstaff's PlanetBids Website on October 18, 2023. On November 15, 2023, the City received three (3) Statements of Qualifications from Engineering Consultant Firms. A six-member Selection Committee consisting of City Staff and one outside Construction Consultant, reviewed and evaluated the statements. Based upon the numerical scoring of the SOQs, the Selection Committee identified the most qualified Firm to perform the engineering professional services for the Project and recommended to commence negotiations for a scope and fee proposal to be provided by Hazen and Sawyer. Final scores of all firms are as followed:

Hazen and Sawyer	588.55
Black and Veatch	520.27
Carollo	519.88

**Connection to PBB Priorities and Objectives:**

Safe & Healthy Community: Foster a safe, secure, and healthy community. Sustainable, Innovative Infrastructure: Deliver outstanding services to residents through a healthy, well maintained infrastructure system.

**Connection to Regional Plan:**

- Goal PF.2.: Provide sustainable and equitable public facilities, services, and infrastructure systems in an efficient and effective manner to serve all population areas and demographics.
- Goal WR.3: Satisfy current and future human water demands and the needs of the natural environment through sustainable and renewable water resources and strategic conservation measure.
- Goal WR.4. Logically enhance and extend the City's public water, wastewater, and reclaimed water services including their treatment, distribution, and collection systems in both urbanized and newly developed areas of the City to provide an efficient delivery of services.
- Goal WR.6: Protect, preserve, and improve the quality of surface water, groundwater, and reclaimed water in the region.
- Goal CD.1. Improve the City and County financial systems to provide for needed infrastructure development and rehabilitation, including maintenance and enhancement of existing infrastructure

**Connection to Carbon Neutrality Plan:**

BE-3: Reduce energy use in existing buildings  
WS-1: Improve water infrastructure and expand on water reuse  
HS-4: Improve the resilience of public infrastructure and City facilities

**Connection to 10-Year Housing Plan:**

None.

**Connection to Division Specific Plan:**

The Treatment Facility Master Plan supports Water Services mission: *"To professionally and cost-effectively provide water, wastewater, and stormwater services that the present and future environmental, health, and safety needs of the community."*

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**Attachments:**    City of Flagstaff TFMP Agreement

# **City of Flagstaff Treatment Facilities Master Plan**

Owner: City of Flagstaff (City)  
Engineer: Hazen and Sawyer (Hazen)

The City of Flagstaff is seeking professional engineering services for development of a treatment facilities master plan (TFMP) to address near and long-term management of wastewater and biosolids produced at the Rio de Flag Water Reclamation Facility (RDFWRF) and the Wildcat Hill Water Reclamation Facility (WHWRF).

## **SCOPE OF SERVICES**

Engineer shall perform the following tasks.

### **TASK 100 – PROJECT MANAGEMENT & MEETINGS**

#### 110 – Project Management

Hazen shall perform various project management and monitoring activities associated with the project. Specific project management services include development of a Project Management Plan, development of project progress reports to be included with monthly invoices, development of applicable formats and standards, coordination and collaboration with the City's staff, and management of individual project team resources to assist in a project delivery consistent with the City's specific needs.

#### 120 – Progress Meetings

Hazen will conduct regular progress meetings with the City's staff to collect relevant information, receive guidance on the evaluation efforts, discuss issues and concerns, and monitor the progress of the work. Progress meetings may be replaced or combined with project Workshops when appropriate. Hazen will be responsible for developing the meeting agenda and discussion materials. Following each progress meeting, Hazen shall develop meeting minutes, including relevant action items, for distribution to the City's staff at least ten (10) days prior to the next progress meeting.

Hazen shall meet virtually with City of Flagstaff Capital Engineering staff member, Mac McNamara, Senior Project Manager, as needed to coordinate capital projects currently in process and planned.

#### 130 – Project Workshops

The project workshops will provide the City's staff the opportunity to review and provide input to intermediate work products as they are developed.

The following workshops are envisioned for the TFMP project:

1. Kickoff Workshop - the first project meeting will be a "Kickoff Workshop" to discuss the planning goals and objectives, planning process, work plan, and schedule. Hazen will request and obtain at that time, if possible, relevant planning data for use in process evaluations, condition assessments, biosolids and effluent management review, and other tasks as appropriate.
2. Facilities Condition Assessment

3. Flow and Load Projections, and Regulatory Trends
4. Biosolids Disposal, Beneficial Use, and Treatment Recommendations
5. Alternative Wastewater Treatment Evaluation
6. Program Assessment
7. SCADA/Controls Evaluation
8. Draft Treatment Facilities Mater Plan

Hazen will prepare up to two (2) presentations to the Water Commission and two (2) presentations to Flagstaff City Council, as needed, to relay the results of the work and recommendations of the TFMP.

#### 140 – Quality Management

Hazen shall provide quality management reviews throughout the duration of the project. Each deliverable will be reviewed by senior engineering or professional staff for quality and consistency. Internal QC review comments shall be tracked and shall include a comment resolution step to confirm that all comments have been properly addressed.

#### 150 – Project Control and Reporting

Monthly invoices will be prepared and submitted to the City in an approved format. Monthly project status reports will be prepared and submitted to the City along with the monthly invoices. These reports will include summary of services completed since the previous report, current project schedule and budget status, project issues, and potential change logs.

#### 160 – Project Closeout

During the project study phase close-out, Hazen will resolve final invoices to the City, consolidate and archive project files, and meet with the City to review the project performance and achievement of project objectives.

##### *Task Series 100 Assumptions:*

- Project duration is 12 months
- Hazen will host up to six (6) progress meetings, which shall be held virtually via MS Teams and be of 1-hour duration
- Hazen will host up to eight (8) workshops, which shall be held in-person in Flagstaff and be no more than 4-hour duration
- Hazen will participate in up to two (2) Water Commission meetings
- Hazen will participate in up to two (2) City Council meetings

##### *Task Series 100 Deliverables:*

- Project Management Plan in electronic PDF format
- Progress Meeting Agenda and Meeting Minutes (up to 6) in electronic PDF format
- Workshop Agenda and Meeting Minutes (up to 8) in electronic PDF format
- Monthly Invoices and Summary Reports (12) in electronic PDF format
- Presentations to Water Commission or City Council (up to 4) in electronic PPT format

## TASK 200 - EVALUATIONS AND TECHNICAL MEMORANDA

A complete series of evaluations were completed as part of the 2018 Biosolids Master Plan. Each major evaluation resulted in a technical memorandum (TM) summarizing the findings and recommendations for future maintenance. Hazen shall review these evaluations and update them based on data provided by the City. In addition, Hazen shall develop a recommended path forward for upgrading all components as the facilities are improved and capacity is increased.

### 210 - Facilities Assessment

Hazen will review and update the following information as provided in the 2018 Biosolids Master Plan. Hazen will evaluate the condition of the existing RDFWRF and WHWRF and provide recommendations for long-term sustainability and reliable operation. Hazen will perform the following sub-tasks:

- Develop a condition assessment plan for each RDFWRF and WHWRF based on the asset registers, including identified asset risk, from the 2018 Biosolids Master Plan that will describe the methodology to be used for the facilities condition assessment.
- Conduct a facility assessment to update the electrical, mechanical, and structural condition of existing facilities and present findings in tabular format; identify potential improvements for service through year 2050.
  - Asset risk and other factors such as environmental and maintenance history will be used to identify a list of critical above-ground assets at RDFWRF for a “focused” Level 1 visual condition assessment comprising 20-25% of the assets at RDDFWRF. An inspection team shall perform visual evaluations in the field of physical condition and performance of all accessible assets on paperless forms that consist of the checklist of asset attributes to be collected or verified and guidance to assign a numeric score from 1 (excellent) to 5 (poor), based on asset condition. During site inspection, asset attributes shall be verified, electronic photographs shall be taken, and condition scores shall be assigned. The data collected for the assets shall include photographs of the assets, the inspectors’ notes, condition scores for specific attributes, and inspection checklists, and shall be stored digitally.
  - Condition assessment at WHWRF will include staff interviews and a site inspection with City staff to validate and update previous recommendations. The data collected for the assets shall include photographs of the assets and inspectors’ notes, stored digitally.
- Update the asset registry based on the results of the field condition assessment. Evaluate process trains for reliability, redundancy, ease of maintenance, maintenance costs, and estimated remaining "useful life", and make recommendations for improvements, if necessary. Remaining useful life of assets will be calculated based on industry best practices (e.g., WERF, AWWA, EPA), experience from local and similar projects, and on-site condition assessment. Hazen will customize the standard useful lives in the industry by weighing each of these factors in determining the remaining useful lives of the City’s RDFWRF and WHWRF assets.
- Evaluate SCADA, PLC, automation systems and associated networks for consistent, reliable operation of the RDFWRF and WHWRF via site inspection with City SCADA and I&C staff and recommend updates and upgrades.
- Include all proposed improvements in the economic and funding analysis in Task 300 and prioritize them in the CIP. A replacement schedule, as applicable, will be included in the CIP.
- Provide a summary of the potential code impacts and basis for future designs based on current building codes and regulatory compliance.

- Prepare a technical memorandum to document the evaluation of existing RDFWRF and WHWRF facilities. Incorporate the City's review comments from the draft TM and workshop in the final TFMP document.

*Assumptions:*

- The asset registers from the 2018 Biosolids Master Plan are complete, includes asset risk (i.e., consequence of failure and probability of failure), and will be provided by the City in editable XLS format.
- Condition assessment at RDFWRF will be a “focused” Level 1 assessment limited to assets identified as critical in the desktop evaluation.
- Condition assessment at WHWRF will include staff interviews and a site inspection with City staff to validate and update previous recommendations.
- Plant staff will be available to support facility assessments, including entering confined spaces, opening electrical panels, and exercising equipment, as necessary.
- Facilities site evaluation shall consist of no more than five (5) eight-hour days on-site; a minimum of one (1) full day at each RDFWRF and WHWRF.
- The estimated lifespans or useful lives shall be based on industry best practices (as defined by WEF and EPA) experience from local and similar projects, and the on-site condition assessment. Useful lives are enhanced or diminished by factors such as operating environment, operational history, maintenance procedures, construction quality, material quality, external stresses, among others.

*Deliverables:*

- Updated asset registry in electronic XLS format
- Draft Facility Condition Assessment Technical Memorandum in electronic PDF format

## 220 - Waste Load Review and Projections

Hazen will review and update the following information as provided in the 2018 Biosolids Master Plan. Hazen will summarize past and current waste load trends and project future waste load quantities for years 2024 - 2050. Hazen will perform the following sub-tasks:

- Collect existing historical facility influent data (City-supplied data), utilizing at a minimum data from 2012 to current, and waste load summaries generated by other sources to-date. The City may choose to collect and analyze current sample influent data to verify historical data.
- Evaluate the influent data to derive (current) annual average loadings for flow, biochemical oxygen demand (BOD) (including Soluble), chemical oxygen demand (COD) (including Soluble), total suspended solids (TSS), alkalinity, nitrogen, ammonia, nitrate and nitrite, Total Kjeldahl Nitrogen (TKN), phosphorus, sulfur compounds, and associated flow and load peaking factors for maximum month, peak week and peak day.
- Evaluate and include in projected future waste loads the impacts of current un-sewered population and the result of water conservation and lower flows.
- Project future facility influent loadings based on projected domestic, City-supplied commercial and industrial loading data and summarize by flow, BOD (including Soluble), COD (including Soluble), TSS, alkalinity, nitrogen, ammonia, nitrate, nitrite, and TKN by annual average, maximum month, peak week and peak day loads for years 2030, 2040, and 2050. Projections will include secondary solids from the RDFWRF, as well as both secondary and primary solids from the WHWRF. City-provided estimates of septage, FROG, and food waste will be incorporated.

- Summarize the findings in a draft TM for the City's review and incorporate the City's comments in the TFMP document.

*Assumptions:*

- City will provide population data and projections for the planning horizon, including identification of un-sewered population.
- City will provide the most recent three (3) years of daily flow/load records along with operations data (monthly reports) from 2012 to current.
- City will provide one (1) week of hourly flow data from the maximum month of flow from the past year.

*Deliverables:*

- Draft Waste Load Review and Projections Technical Memorandum in electronic PDF format

### 230 - Current and Potential Future Regulatory Requirements

Hazen will summarize and define the current and potential future regulations that may affect operations at the City's water reclamation facilities. Hazen will perform the following sub-tasks:

- Review the current effluent discharge operating permit, currently proposed regulations, and how they may affect the future operations.
- Summarize current and anticipated future permit conditions in tabular format with descriptions.
- Provide guidance on necessary process improvements needed to meet requirements throughout the planning period (2024 - 2050).
- Summarize the findings of these sub-tasks in a draft TM for the City's review and incorporate the City's comments in the final TFMP document.

*Deliverables:*

- Draft Regulatory Requirements Technical Memorandum in electronic PDF format

### 240 - Process Treatment Capacity Evaluation

Hazen will review and update the following information as provided in the 2018 Biosolids Master Plan. Hazen will develop long-range process treatment alternative(s) at the RDFWRF and WHWRF to meet the regulatory requirements identified in Task 230 and meet operations treatment goals. Hazen will perform the following sub-tasks:

- Perform computer simulation modeling, using the City's current BioWin models, of the liquid process stream and wastewater treatment process using facility operating records for calibration. Request testing, as needed, to validate existing model calibration.
- Prepare a solids mass balance using the results of the modeling effort.
- Determine the firm hydraulic and solids loading capacity and peak capacity of individual treatment processes using the results of the process models (summarize in tabular format); include redundancy and reliability information/requirements.
- Identify any issues related to water conservation at the facilities (i.e., decreasing flows and increasing loads).
- Identify process deficiencies for the various influent load and regulatory scenarios.
- Prepare a draft TM that describes the findings of this evaluation and incorporate the City's review comments in the final TFMP document.

*Assumptions:*

- Existing BioWin models are calibrated and no additional calibration effort will be required.

*Deliverables:*

- Updated BioWin models
- Draft Process Treatment Capacity Evaluation Technical Memorandum in electronic PDF format

## 250 - Hydraulic Capacity Evaluations

Hazen will review and update the following information as provided in the 2018 Biosolids Master Plan. Hazen will review, validate, and update the existing City hydraulic model for the RDFWRF and WHWRF to reflect current conditions and potential hydraulic limitations based upon the information developed in the Tasks above. Hazen will perform the following sub-tasks:

- Evaluate and validate the existing hydraulic model, determine locations of flow restrictions, and recommend corrective measures to these flow restrictions.
- Include any new process flow elements as a result of the alternative analysis.
- Include all sub-systems impacting the hydraulic and solids loading profile (i.e., equalization basin, internal recirculation systems, etc.).
- Prepare a draft TM that describes the findings of this evaluation and incorporate the City's review comments in the final TFMP document.

*Assumptions:*

- City will provide existing hydraulic models in editable format.
- City will provide record drawings for both RDFWRF and WHWRF.
- City will provide flow data from SCADA during field investigations of hydraulic elevations and control points.
- City will provide survey of hydraulic control points at both RDFWRF and WHWRF.

*Deliverables:*

- Draft Hydraulic Capacity Evaluation Technical Memorandum in electronic PDF format

## 260 - Alternative Process Evaluation

Hazen will develop alternative(s) for meeting the process capacity assessment, regulatory requirements, and potential advanced wastewater treatment needs developed in the previous tasks. Hazen will perform the following sub-tasks:

- Evaluate up to five (5) applicable treatment technologies, including conventional treatment, membrane bioreactors, or other applicable treatment alternatives for discharges and/or potential reclaimed water application(s) at WHWRF via desktop analysis and shortlist three (3) for additional modeling. Evaluate one (1) treatment technology alternative at RDFWRF. Consideration should be given to effluent nitrogen limitations, contaminants of emerging concern (CEC's), endocrine disruptors (ED's), per- and polyfluoroalkyl substances (PFOS/PFAS) and other compounds of concern.
- Evaluate treatment facilities for potential opportunities and uses regarding indirect potable reuse and Advance Water Purification.
- Evaluate the need for increasing capacity of the existing WHWRF and RDFWRF facility processes with other applicable technologies versus the feasibility of upgrading/expanding.
- Evaluate and provide up to three (3) technology and cost comparisons for the WHWRF solids disposal methods (if applicable). Previous studies may be utilized as a reference.

- Develop treatment scenarios for achieving various effluent qualities based on the potential regulations discussed in Task 230 (i.e., effluent nitrogen limitations).
- Develop up to three (3) recommended improvement alternative(s) at WHWRF and one (1) at RDFWRF, including process flow diagrams (PFDs) to appropriate level of detail, and concept site plans for the identified treatment scenarios, to sufficiently verify footprint/space requirements and establish AACE Level 5 cost estimates. Cost estimates shall include capital, operation, and maintenance, as well as City's supplied legal and administrative costs for the alternatives identified. Capital and life-cycle cost analyses will be used to compare costs for the recommended alternatives.
- Prepare detailed phasing plan for the recommended improvement alternative(s) that includes key decision points to meet future capacity needs.
- Prepare a draft TM that describes the alternative(s) and incorporate the City's review comments in the final TFMP document.

*Assumptions:*

- A desktop analysis of five (5) different process train alternatives will be considered for evaluation at WHWRF, and three (3) process train alternatives will be shortlisted for additional modeling. One (1) process train alternative will be evaluated at RDFWRF.
- Cost estimates for up to three (3) alternatives at WHWRF and one (1) alternative at RDWRF shall be developed and accuracy shall comply with Level 5 standards as defined by the Association for Advancement of Cost Estimating International (AACE), which are appropriate for preliminary-level planning work.

*Deliverables:*

- Draft Alternative Process Evaluation (RDFWRF and WHWRF) Technical Memorandum in electronic PDF format

270 - SCADA/Controls Evaluation

Hazen will assess the SCADA system and its components for the purpose of evaluation. Hazen will perform the following sub-tasks:

- Verify existing network documentation to the actual network through visual assessment, interview with city SCADA staff and review of communication configuration within the PLC programming. This network assessment shall be documented in the form of a block network diagram. Recommendations of improvements to the network will be prioritized and included in the final report.
- Verify control cabinets at the two facilities comply with the current City of Flagstaff Specification and Standard as they exist at the time of the Assessment. Including Programming standards. Current specifications and standards shall be discussed with SCADA Staff before and during the Assessment. This Control and Programming assessment shall identify control cabinets or SCADA nodes/devices that do not meet the Standard or specifications. Recommendations of improvements to control cabinets and SCADA nodes/devices will be prioritized and included in the final report.
- Review the City's current equipment, programming, and alarm Tag naming conventions. Hazen will review Tag naming assessment and make recommendation for naming configurations methodology, and improvements as needed. Recommendations of improvements to the Tag naming conventions will be included in the final report.
- Review the City's SCADA alarm generating philosophy and methodology. This assessment shall identify a prioritized list of recommendations to include aligning system alarms with specifications and standards and potentially identifying future system alarms required by Operations and

Maintenance staff. Recommendations of improvements to the SCADA alarm system will be included in the final report.

- Verify the Facility SCADA HMI is implemented within the Water Services specifications and standards. Hazen will assess the SCADA HMI and identify a prioritized plan to upgrade and update the software, hardware, operating system, and physical location of the SCADA HMI. Recommendations of improvements to the SCADA HMI will be included in the final report.
- Verify the historian and reports is implemented within the Water Services specifications and standards. This data and reporting assessment shall include a list of prioritized recommendations for improvements needed in reports and data and develop an implementation plan to address missing reports and data. Hazen shall identify opportunities to automating the generation of these reports.
- Summarize these assessments in a draft TM for the City's review and incorporate the City's review comments in the final TFMP document. Summary will include:
  - SCADA Network Architecture Map
  - Prioritized improvement plan to areas of non-compliance
  - Control Cabinet assessment summary
  - PLC Programming standard summary
  - Prioritized improvement plan for control cabinets, PLC programming of non-compliance, and updated standards
  - Current Tag naming assessment summary
  - Prioritized improvement plan for tagging naming standard and needed improvements throughout the system.
  - SCADA System Alarm Assessment summary
  - Prioritized improvement plan for alarming and updating the City Alarm Strategy and philosophy standard
  - SCADA HMI assessment summary
  - Prioritized improvement plan for SCADA HMI standards, updating software and other SCADA HMI improvements
  - SCADA Data and Reporting summary
  - Prioritized improvement plan for SCADA historian and reporting structure

Project workshops will provide the City's staff the opportunity to review and provide input to assessments as they are developed. The following workshops are envisioned as part of this task:

- SCADA Network Assessment; duration up to four (4) hours
- SCADA Control and Programming; duration up to four (4) hours.
- Up to two (2) SCADA Tag Naming Assessment workshops; duration up to four (4) hours each
- Up to two (2) SCADA System Alarm Assessment workshops; duration up to two (2) hours each
- Up to two (2) SCADA HMI Assessment workshops; duration up to four (4) hours each
- Up to two (2) SCADA Data and Reporting Assessment workshops; duration up to two (2) hours each.

*Assumptions:*

- Hazen will conduct up to five (5) days of site visits to document all nodes in the treatment system to perform a SCADA Network Assessment and Control and Programming Assessment.
- The SCADA Network Assessment will include a visual review of nodes on the system, review of existing network documentation and review of PLC communication configuration within the PLC code. A node shall include major SCADA equipment including PLC(s), Remote Input/Outputs, OIT(s), HMI workstation. Peripheral equipment are not included.

- All programs for Program standards review will be provided by the City. Programming standards review will include review of PLC programming only.
- City shall provide copies of standards and specifications for control cabinets, PLC, OIT, HMI and tagging. If no standards are available Hazen will make recommendations of industry best practices.
- All documented tag lists from equipment, programming (PLC, OIT, and HMI), and alarm tag will be provided by the City for Hazen in a complied .csv digital format.
- City shall provide copies of documented PLC programs and configurations.
- City shall provide copies of documented OIT programs and configurations.
- City shall provide copies of documented HMI programs and configurations.
- Hazen will host up to ten (10) workshops, which shall be held virtually and be no more than 4-hour duration

*Deliverables:*

- Workshop Agenda and Meeting Minutes (up to 10) in electronic PDF format
- Draft SCADA/Controls Evaluation Technical Memorandum in electronic PDF format

280 – Staffing and Training Needs

Hazen will develop a TM to address staffing levels and training plan based on industry standards. Existing operations, future treatment alternatives, and future treatment capacity shall be considered. Hazen will perform the follow sub-tasks:

- Evaluate and verify the existing staffing levels meet the needs of existing operations, if not provide recommendations of staffing levels based on industry standards.
- Evaluate and provide recommendations on staffing levels for treatment alternatives that may be implemented in the future. As appropriate phased staffing level implementation shall be based on selected treatment alternatives and additional capacity of all processes.
- Staffing level recommendations shall also include needed experience and/or expertise (i.e., operations, mechanical, electrical, SCADA, etc.).
- With the staffing challenges for these positions, alternative options may be necessary. Provide recommended alternatives to in-house staffing, such as instrumentation, SCADA, automation, and/or on-call contract services, and associated costs for these services.
- Provide training recommendations for the needed expertise to properly run and operate the City's treatment processes (i.e., operations, mechanical, data analytics, vibration analysis, Citect, electrical, PLC, etc.)
- Prepare a draft TM that describes the City's staffing needs and incorporate the City's review comments in the final TFMP document.

*Assumptions:*

- Starting point of evaluation will be current organizational chart and job descriptions.
- Staffing levels will be evaluated for existing operations, three (3) process train alternatives at WHWRF, and one (1) alternative at RDFWRF.
- Up to two (2) alternatives to in-house staffing will be evaluated.
- Operations is defined as staff required for process monitoring, maintenance, and laboratory analysis.

*Deliverables:*

- Draft Staffing and Training Needs Technical Memorandum in electronic PDF format

## **TASK 300 – FUNDING AND FINANCING**

Hazen will prepare a TM with recommended funding and financing options for upgrading and increasing the capacity of the treatment facilities and/or its individual components based on the City's unique financial characteristics. Hazen shall perform the following sub-tasks:

- Research and identify grant opportunities that may be applicable to design and construction of future treatment upgrade projects identified in the TFMP.
- Identify what phases of projects (planning, design, construction) can be captured within the City's existing and future utility rate structure.
- Identify and explore the benefits and drawbacks of alternative funding options such as Public Private Partnerships, bonds, special taxes, grants, and any other currently available funding sources.
- Prepare a draft TM that describes the City's staffing needs and incorporate the City's review comments in the final TFMP document.

### *Assumptions:*

- Funding support includes guidance and review of up to two (2) applications developed by the City for this project. City will write the grant application(s).

### *Deliverables:*

- Funding and Financing Technical Memorandum

## **TASK 400 - TREATMENT FACILITY MASTER PLAN**

Hazen shall prepare a Treatment Facility Master Plan document presenting and summarizing the results of the investigations, evaluations, and recommendations developed in the preceding tasks. The TFMP shall include explanatory text, illustrative figures, and data tables to summarize the recommendations for improvement. Hazen will perform the following sub-tasks:

- Prepare a draft outline of the TFMP and review the draft with the City's personnel.
- Prepare a Draft TFMP report for the RDFWRF and WHWRF following ADEQ facility planning requirements and any pertinent (e.g., AWWA, WEF) industry good practice guidelines/requirements. This report shall take into consideration current and future projects, phasing as appropriate, project grouping to get an economy of scale, and scheduling to meet the treatment and capacity needs for the City's treatment facilities.
- Incorporate the City's review comments and prepare a Final TFMP including an executive summary.
- Develop a recommended capital improvement plan (CIP) based on the results of hydraulic modeling scenarios, facilities evaluation, and other analyses conducted in previous tasks. Included will be a recommendation of phased approach to treatment improvements throughout the planning period and identification of potential key decision points and response strategies to address alternative regulatory requirements. Hazen shall identify possible flexibility for future regulatory changes including total dissolved solids (TDS), nitrogen, phosphorus, and trace constituent removal. A proposed schedule of the asset condition-driven rehabilitation and replacement (R&R) upgrades and the recommended technology improvements will be integrated into the CIP. All CIP items will be prioritized and tabulated, with costs, into a comprehensive implementation plan.

*Assumptions:*

- Content from technical memoranda developed in Tasks 200 and 300 will be updated and included in the body of the TFMP, superseding the previous working documents delivered to the City.
- Any models, spreadsheets, and any other supporting data shall be provided to the City and shall become the property of the City of Flagstaff.
- Cost estimates' accuracy shall comply with Level 5 standards as defined by the Association for Advancement of Cost Estimating International (AACE), which are appropriate for preliminary-level planning work.
- Capital Improvement Plan format shall consist of a project list with individual project sheets. Each sheet shall include a brief discussion of background and purpose of the project, project description, and cost estimate summary, including project triggers where applicable.

*Deliverables:*

- Outline of Treatment Facility Master Plan in electronic PDF format
- Draft Treatment Facility Master Plan in electronic PDF format, including executive summary, recommended 5- and 10-year capital improvement plan, and technical memoranda as appendices
- Comment log summarizing City review comments and their disposition
- Six (6) printed copies and one (1) editable version of the Final Treatment Facility Master Plan with an executive summary, recommended 5- and 10-year capital improvement plan, and technical memoranda as appendices
- Any models, spreadsheets, and any other supporting data in editable format

## **ALLOWANCE**

The scope, level of effort, and associated cost for additional engineering services, including but not limited to survey and geotechnical services, will be as determined and agreed upon by the City and Hazen before the work is performed.

City will make any pertinent survey information in the City's records for the WHWRF and RDFWRF site available. However, Hazen may provide, if needed, through qualified subconsultants, survey services to support the field investigation and conceptual design. Survey services may include verification of horizontal and vertical control on existing structures and pipelines and confirmation of elevations of weirs and other critical hydraulic controls

## **SERVICES NOT INCLUDED IN SCOPE OF WORK**

The following services have not been included in this scope of work. These services may be provided under additional task order(s) if deemed necessary by the City, and only after approval in writing:

- Public outreach efforts.
- Meetings with regulatory or permitting agencies.
- Calibration of existing BioWin models, incl. development and execution of a sampling protocol.
- Coordination and participation in visits to sites using proposed technologies.
- Design, permitting, or construction phase services for improvements recommended through the course of the study.
- Grant writing services.
- SCADA Equipment Assessment
- CMMS and GIS Assessment

## KEY PERSONNEL

Name	Role	Phone	Email
Hazen			
Curt Courter	Principle in Charge	480-465-4504	ccourter@hazenandsawyer.com
Andrea Odegard-Begay	Project Manager	214-682-4996	aodegardbegay@hazenandsawyer.com
Katie Vanyo	Comprehend Task Lead	480-417-5664	kvanyo@hazenandsawyer.com
Doug Kobrick	Explore Task Lead	480-465-4506	dkobrick@hazenandsawyer.com
Stantec			
Rob McCandless	Principle in Charge/ Converge Task Lead	480-687-6105	rob.mccandless@stantec.com
Naho Garvin	Project Manager	801-617-3215	naho.garvin@stantec.com

No.	Task List	Curt Courter Hazen Principal in Charge \$280/h	Wendell Khunjar Technical Advisor & QA/QC \$280/h	Andrea Odegard-Begay Project Manager \$260/h	Katie Vanyo Comprehend Phase Task Lead \$240/h	Pouya Shahsana Structural Engineer \$210/h	Alec Hanson Facility Assessment \$180/h	Lindsey Bennet Process Modeling \$180/h	Riley Murnane Principle Engineer \$180/h	Jacob Mitten-Thomsen Assistant Engineer \$145/h	Doug Kobrick Explore Phase Task Lead \$280/h	Chris Currier Construction Cost Estimating \$240/h	Jason Joynes Staffing Analysis and Training \$185/h	Troy Walker Membrane Bioreactor Operations \$280/h	Klint Fletcher SCADA Evaluation and Standardization \$280/h	Jason Hoyt SCADA Evaluation and Standardization \$240/h	Adam Butts &C Engineer \$240/h	Rob McCandless Converge Phase Task Lead \$285/h	Kevin Daniels Implementation \$210/h	Heather Tugaen Regulatory Outlook \$210/h	Steve Winfree Solids Handling \$260/h	Kenny Chen Implementation \$210/h	Kahao Lim Implementation \$180/h	Carol Malesky CIP Development and Financing \$280/h	Amy Broughton Funding \$260/h	Kyleen Marcella Advanced Treatment \$210/h	Corey Callaway Electrical \$210/h	Johnathan Muthart SCADA/I&C \$210/h	Chris Machado Technical Advisor & QA/QC \$285/h	Naho Garvin Stantec Project Manager \$210/h	TOTAL HOURS	LABOR FEES	EXPENSES	TOTAL		
<b>TASK 100 – PROJECT MANAGEMENT &amp; MEETINGS</b>		6	40	108	40	0	0	0	0	12	8	0	0	8	22	0	0	48	45	9	6	0	12	0	6	8	0	0	64	42	438	\$ 121,980	\$ 5,400	\$ 127,380		
110	Project Management	6		6						12								6														18	\$ 6,210		\$ 6,210	
120	Progress Meetings			6	2													6	9	9												46	\$ 9,830		\$ 9,830	
130	Project Workshops			72	30													24	36												198	\$ 48,960	\$ 5,400	\$ 54,360		
140	Quality Management		40											8	16			12								8					108	\$ 41,260		\$ 41,260		
150	Project Control and Reporting			22																												46	\$ 10,760		\$ 10,760	
160	Project Closeout			2	8																										12	\$ 4,960		\$ 4,960		
<b>TASK 200 - EVALUATIONS AND TECHNICAL MEMORANDA</b>		0	40	48	36	48	120	120	0	212	24	50	80	8	80	340	273	18	112	40	28	50	418	0	0	0	62	62	0	0	2229	\$ 477,730	\$ 10,600	\$ 488,330		
210	Facilities Site Evaluation/Reliability Criteria			6		48	120			40		18	40				48		26				26				18	18			408	\$ 79,980	\$ 10,600	\$ 90,580		
220	Waste Load Review and Projections			6						4								4	34				70								118	\$ 23,020		\$ 23,020		
230	Current and Potential Future Regulatory Requirements			6						4										40												50	\$ 10,540		\$ 10,540	
240	Process Treatment Capacity Evaluation		20	6	12			60		4								4	20				50								156	\$ 35,760		\$ 35,760		
250	Hydraulic Capacity Evaluations			6						4								2	32				132								176	\$ 33,190		\$ 33,190		
260	Alternative Process Evaluation		20	12	24			60		140	24	32						8			28	50	140			44	44			606	\$ 123,720		\$ 123,720			
270	SCADA/Controls Eval									4					80	340	225														649	\$ 158,580		\$ 158,580		
280	Staffing and Training Needs			6						12			40	8																	66	\$ 12,940		\$ 12,940		
<b>TASK 300 – FUNDING AND FINANCING</b>		0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	36	148	0	0	0	0	0	192	\$ 50,740	\$ -	\$ 50,740		
310	Evaluate Funding and Financing Opportunities			2														2					18	80							102	\$ 26,930		\$ 26,930		
320	Funding and Financing TM			2														2					18	68							90	\$ 23,810		\$ 23,810		
<b>TASK 400 - WASTEWATER TREATMENT MASTER FACILITY PLAN</b>		0	0	12	12	0	12	56	0	100	0	0	0	0	12	56	0	10	14	32	14	18	18	0	18	0	22	18	16	16	456	\$ 93,710	\$ 2,000	\$ 95,710		
410	Draft Plan			8	8		8	40		60					8	40		8	6	24	6	18	18		16		20	16	16	16	336	\$ 69,980		\$ 69,980		
420	Final Plan			4	4		4	16		40					4	16		2	8	8	8	8		2		2	2	2	2	120	\$ 23,730	\$ 2,000	\$ 25,730			
<b>ALLOWANCE</b>																																			\$ 30,000	
<b>TOTAL:</b>		6	80	172	88	48	132	176	0	324	32	50	80	16	114	396	273	80	171	81	48	68	448	36	172	8	84	80	80	58	3315	\$ 744,160	\$ 18,000	\$ 792,160		

**PROFESSIONAL SERVICES CONTRACT**  
**Contract No.: 2024-40**

This Contract is entered into this \_\_\_\_ day of \_\_\_\_\_, 20\_\_ by and between the City of Flagstaff, a political subdivision of the State of Arizona ("City"), and Hazen and Sawyer P.C., (an Arizona Professional Corporation) ("Firm").

WHEREAS, the City desires to receive and Firm is able to provide professional services;

NOW THEREFORE, in consideration for the mutual promises contained herein, the City and Firm (the "parties") agree as follows:

**SERVICES**

1. **Scope of Work:** Firm shall provide the professional services generally described as follows:

**PROFESSIONAL ENGINEERING SERVICES**  
**Treatment Facility Master Plan**

and as more specifically described in the scope of work attached hereto as Exhibit A.

2. **Schedule of Services:** Firm shall perform all work per the schedule set forth in Exhibit A.
3. **Standard Terms and Conditions:** The City of Flagstaff Standard Terms and Conditions, attached hereto as Exhibit B are hereby incorporated by reference and shall apply to performance of this Contract, except to the extent modified in Exhibit A.
4. **Key Personnel/Subcontractors:** Firm's Key Personnel, Subcontractors (if any), and contact information are designated in Exhibit A. Key Personnel are those employees whose license number and signature will be placed on key documents and those employees who have significant responsibilities for completion of the services. The City Representative for this Contract has the right to approve any proposed substitution of Key Personnel or Subcontractors.

**CITY RESPONSIBILITIES**

5. **City Representative:** The City Representative is Shannon Jones, Water Services Director, or his designee. All communications to the City shall be through the City Representative. City Representative is responsible for bringing any request for a Contract amendment or price adjustment to the attention of the City Buyer.
6. **City Cooperation:** City will cooperate with Firm by placing at its disposal all available information concerning the City, City property, or the City project reasonably necessary for Firm's performance of this Contract.

**CONTRACT TERM**

7. **Contract Term:** The Contract shall be effective as of the date signed by both parties. Performance shall commence within ten (10) days from the City's issuance of the Notice to Proceed and shall be in force for an initial term of one (1) year.
8. **Renewal:** This Contract may be renewed for up to one (1) additional one (1) year terms by mutual written consent of the parties. The City Manager or his designee (the Purchasing Director) shall have authority to approve renewal on behalf of the City.

9. Termination: This Contract may be terminated pursuant to the Standard Terms and Conditions attached hereto as Exhibit B.

#### PAYMENT

10. Compensation: Firm shall be paid **seven hundred ninety-two thousand one hundred sixty dollars and zero cents (\$792,160.00)** for satisfactory performance of the services in accordance with the Scope of Work identified in Exhibit A.
11. Price Adjustment: Any price adjustment must be approved by the City in writing as a formal Contract Amendment. The City Council must approve the price adjustment if the annual contract price exceeds \$100,000; otherwise the City Manager or his designee (the Purchasing Director) shall have authority to approve a price adjustment on behalf of the City.

#### DATA AND RECORDS

12. City Ownership of Document and Data: Any original documents prepared or collected by Firm in performance of this Contract such as models, samples, reports, test plans, survey results, graphics, tables, charts, plans, maps, specifications, surveys, computations and other data shall be the property of City ("City's work product"), unless otherwise agreed by the parties in writing. Firm agrees that all materials prepared under this Contract are "works for hire" within the meaning of the copyright laws of the United States and hereby assigns to the City all rights and interests Firm may have in the materials it prepares under this Contract, including any right to derivative use of the material.
13. Re-Use: The City may use the City's work product without further compensation to Firm; provided, however, that the City's reuse without written verification or adaption by Firm for purposes other than contemplated herein is at the City's sole risk and without liability to Firm. Firm shall not engage in any conflict of interest nor appropriate any portion of the City's work product for the benefit of Firm or any third parties without the City's prior written consent.
14. Delivery of Document and Data: Upon termination of this Contract in whole or part, or upon expiration if not previously terminated, Firm shall immediately deliver to the City copies all of the City's work product and any other documents and data accumulated by Firm in performance of this Contract, whether complete or in process.

#### INSURANCE

15. Insurance: Firm shall meet insurance requirements of the City, as set forth in Exhibit C.

**(REMAINDER OF THIS PAGE LEFT INTENTIONALLY BLANK)**

MISCELLANEOUS

16. Notice: Any notice concerning this Contract shall be in writing and sent by certified mail and email as follows:

To the City:

Teddy Callan  
Procurement Specialist  
City of Flagstaff  
211 W. Aspen  
Flagstaff, Arizona 86001  
Teddy.callan@flagstaffaz.gov

To Firm:

Curtis Courter  
Vice President  
Hazen and Sawyer  
1400 E. Southern Ave, Suite 340  
Tempe, AZ 85282  
[ccourter@hazenandsawyer.com](mailto:ccourter@hazenandsawyer.com)

With a copy to:

Shannon Jones  
Director of Water Services  
Water Services  
City of Flagstaff  
2323 N. Walgreen Blvd.  
Flagstaff, AZ 86004  
[shannon.jones@flagstaffaz.gov](mailto:shannon.jones@flagstaffaz.gov)

With a copy to:

Andrea Odegard-Begay  
Senior Associate  
1626 N. Litchfield Rd, Suite 330  
Goodyear, AZ 85395  
[aodegardbegay@hazenandsawyer.com](mailto:aodegardbegay@hazenandsawyer.com)

17. Authority: Each party warrants that it has authority to enter into this Contract and perform its obligations hereunder, and that it has taken all actions necessary to enter into this Contract.

**FIRM**

\_\_\_\_\_

Print name: \_\_\_\_\_

Title: \_\_\_\_\_

**CITY OF FLAGSTAFF**

\_\_\_\_\_

Print name: \_\_\_\_\_

Title: \_\_\_\_\_

**Attest:**

\_\_\_\_\_

City Clerk

**Approved as to form:**

\_\_\_\_\_

City Attorney's Office

Notice to Proceed

issued: \_\_\_\_\_, 20\_\_

**EXHIBIT A**

**SCOPE OF WORK**

**(Attached)**



Hazen and Sawyer  
1626 N. Litchfield Road, Suite 330  
Goodyear, AZ 85395

May 17, 2024

Mr. Mac McNamara  
Water Services Engineering Section Director  
City of Flagstaff  
2323 N. Walgreens St. Suite 1  
Flagstaff, AZ 86004

**Re: Flagstaff Treatment Facilities Master Plan  
Proposal for Engineering Services**

Dear Mr. McNamara:

Hazen and Sawyer (Hazen) herewith submits its proposal for engineering services in development of the City's Treatment Facilities Master Plan to address near and long-term management of wastewater and biosolids produced at the Rio de Flag Water Reclamation Facility (RDFWRF) and the Wildcat Hill Water Reclamation Facility (WHWRF). The enclosed proposal includes a proposed scope of services and spreadsheet breakdown of our proposed fee for these services, which is not to exceed \$792,160. Project duration is anticipated to extend from May 2024 through June 2025.

Please do not hesitate to contact me if you have any questions. I can be reached by cell at 214-682-4996 or by email at [AODEGARDBEGAY@HAZENANDSAWYER.COM](mailto:AODEGARDBEGAY@HAZENANDSAWYER.COM).

Very truly yours,

Andrea Odegard-Begay, PE  
Senior Associate

# **City of Flagstaff Treatment Facilities Master Plan**

Owner: City of Flagstaff (City)  
Engineer: Hazen and Sawyer (Hazen)

The City of Flagstaff is seeking professional engineering services for development of a treatment facilities master plan (TFMP) to address near and long-term management of wastewater and biosolids produced at the Rio de Flag Water Reclamation Facility (RDFWRF) and the Wildcat Hill Water Reclamation Facility (WHWRF).

## **SCOPE OF SERVICES**

Engineer shall perform the following tasks.

### **TASK 100 – PROJECT MANAGEMENT & MEETINGS**

#### 110 – Project Management

Hazen shall perform various project management and monitoring activities associated with the project. Specific project management services include development of a Project Management Plan, development of project progress reports to be included with monthly invoices, development of applicable formats and standards, coordination and collaboration with the City's staff, and management of individual project team resources to assist in a project delivery consistent with the City's specific needs.

#### 120 – Progress Meetings

Hazen will conduct regular progress meetings with the City's staff to collect relevant information, receive guidance on the evaluation efforts, discuss issues and concerns, and monitor the progress of the work. Progress meetings may be replaced or combined with project Workshops when appropriate. Hazen will be responsible for developing the meeting agenda and discussion materials. Following each progress meeting, Hazen shall develop meeting minutes, including relevant action items, for distribution to the City's staff at least ten (10) days prior to the next progress meeting.

Hazen shall meet virtually with City of Flagstaff Capital Engineering staff member, Mac McNamara, Senior Project Manager, as needed to coordinate capital projects currently in process and planned.

#### 130 – Project Workshops

The project workshops will provide the City's staff the opportunity to review and provide input to intermediate work products as they are developed.

The following workshops are envisioned for the TFMP project:

1. Kickoff Workshop - the first project meeting will be a "Kickoff Workshop" to discuss the planning goals and objectives, planning process, work plan, and schedule. Hazen will request and obtain at that time, if possible, relevant planning data for use in process evaluations, condition assessments, biosolids and effluent management review, and other tasks as appropriate.
2. Facilities Condition Assessment

3. Flow and Load Projections, and Regulatory Trends
4. Biosolids Disposal, Beneficial Use, and Treatment Recommendations
5. Alternative Wastewater Treatment Evaluation
6. Program Assessment
7. SCADA/Controls Evaluation
8. Draft Treatment Facilities Mater Plan

Hazen will prepare up to two (2) presentations to the Water Commission and two (2) presentations to Flagstaff City Council, as needed, to relay the results of the work and recommendations of the TFMP.

#### 140 – Quality Management

Hazen shall provide quality management reviews throughout the duration of the project. Each deliverable will be reviewed by senior engineering or professional staff for quality and consistency. Internal QC review comments shall be tracked and shall include a comment resolution step to confirm that all comments have been properly addressed.

#### 150 – Project Control and Reporting

Monthly invoices will be prepared and submitted to the City in an approved format. Monthly project status reports will be prepared and submitted to the City along with the monthly invoices. These reports will include summary of services completed since the previous report, current project schedule and budget status, project issues, and potential change logs.

#### 160 – Project Closeout

During the project study phase close-out, Hazen will resolve final invoices to the City, consolidate and archive project files, and meet with the City to review the project performance and achievement of project objectives.

##### *Task Series 100 Assumptions:*

- Project duration is 12 months
- Hazen will host up to six (6) progress meetings, which shall be held virtually via MS Teams and be of 1-hour duration
- Hazen will host up to eight (8) workshops, which shall be held in-person in Flagstaff and be no more than 4-hour duration
- Hazen will participate in up to two (2) Water Commission meetings
- Hazen will participate in up to two (2) City Council meetings

##### *Task Series 100 Deliverables:*

- Project Management Plan in electronic PDF format
- Progress Meeting Agenda and Meeting Minutes (up to 6) in electronic PDF format
- Workshop Agenda and Meeting Minutes (up to 8) in electronic PDF format
- Monthly Invoices and Summary Reports (12) in electronic PDF format
- Presentations to Water Commission or City Council (up to 4) in electronic PPT format

## TASK 200 - EVALUATIONS AND TECHNICAL MEMORANDA

A complete series of evaluations were completed as part of the 2018 Biosolids Master Plan. Each major evaluation resulted in a technical memorandum (TM) summarizing the findings and recommendations for future maintenance. Hazen shall review these evaluations and update them based on data provided by the City. In addition, Hazen shall develop a recommended path forward for upgrading all components as the facilities are improved and capacity is increased.

### 210 - Facilities Assessment

Hazen will review and update the following information as provided in the 2018 Biosolids Master Plan. Hazen will evaluate the condition of the existing RDFWRF and WHWRF and provide recommendations for long-term sustainability and reliable operation. Hazen will perform the following sub-tasks:

- Develop a condition assessment plan for each RDFWRF and WHWRF based on the asset registers, including identified asset risk, from the 2018 Biosolids Master Plan that will describe the methodology to be used for the facilities condition assessment.
- Conduct a facility assessment to update the electrical, mechanical, and structural condition of existing facilities and present findings in tabular format; identify potential improvements for service through year 2050.
  - Asset risk and other factors such as environmental and maintenance history will be used to identify a list of critical above-ground assets at RDFWRF for a “focused” Level 1 visual condition assessment comprising 20-25% of the assets at RDDFWRF. An inspection team shall perform visual evaluations in the field of physical condition and performance of all accessible assets on paperless forms that consist of the checklist of asset attributes to be collected or verified and guidance to assign a numeric score from 1 (excellent) to 5 (poor), based on asset condition. During site inspection, asset attributes shall be verified, electronic photographs shall be taken, and condition scores shall be assigned. The data collected for the assets shall include photographs of the assets, the inspectors’ notes, condition scores for specific attributes, and inspection checklists, and shall be stored digitally.
  - Condition assessment at WHWRF will include staff interviews and a site inspection with City staff to validate and update previous recommendations. The data collected for the assets shall include photographs of the assets and inspectors’ notes, stored digitally.
- Update the asset registry based on the results of the field condition assessment. Evaluate process trains for reliability, redundancy, ease of maintenance, maintenance costs, and estimated remaining "useful life", and make recommendations for improvements, if necessary. Remaining useful life of assets will be calculated based on industry best practices (e.g., WERF, AWWA, EPA), experience from local and similar projects, and on-site condition assessment. Hazen will customize the standard useful lives in the industry by weighing each of these factors in determining the remaining useful lives of the City’s RDFWRF and WHWRF assets.
- Evaluate SCADA, PLC, automation systems and associated networks for consistent, reliable operation of the RDFWRF and WHWRF via site inspection with City SCADA and I&C staff and recommend updates and upgrades.
- Include all proposed improvements in the economic and funding analysis in Task 300 and prioritize them in the CIP. A replacement schedule, as applicable, will be included in the CIP.
- Provide a summary of the potential code impacts and basis for future designs based on current building codes and regulatory compliance.

- Prepare a technical memorandum to document the evaluation of existing RDFWRF and WHWRF facilities. Incorporate the City's review comments from the draft TM and workshop in the final TFMP document.

*Assumptions:*

- The asset registers from the 2018 Biosolids Master Plan are complete, includes asset risk (i.e., consequence of failure and probability of failure), and will be provided by the City in editable XLS format.
- Condition assessment at RDFWRF will be a “focused” Level 1 assessment limited to assets identified as critical in the desktop evaluation.
- Condition assessment at WHWRF will include staff interviews and a site inspection with City staff to validate and update previous recommendations.
- Plant staff will be available to support facility assessments, including entering confined spaces, opening electrical panels, and exercising equipment, as necessary.
- Facilities site evaluation shall consist of no more than five (5) eight-hour days on-site; a minimum of one (1) full day at each RDFWRF and WHWRF.
- The estimated lifespans or useful lives shall be based on industry best practices (as defined by WEF and EPA) experience from local and similar projects, and the on-site condition assessment. Useful lives are enhanced or diminished by factors such as operating environment, operational history, maintenance procedures, construction quality, material quality, external stresses, among others.

*Deliverables:*

- Updated asset registry in electronic XLS format
- Draft Facility Condition Assessment Technical Memorandum in electronic PDF format

## 220 - Waste Load Review and Projections

Hazen will review and update the following information as provided in the 2018 Biosolids Master Plan. Hazen will summarize past and current waste load trends and project future waste load quantities for years 2024 - 2050. Hazen will perform the following sub-tasks:

- Collect existing historical facility influent data (City-supplied data), utilizing at a minimum data from 2012 to current, and waste load summaries generated by other sources to-date. The City may choose to collect and analyze current sample influent data to verify historical data.
- Evaluate the influent data to derive (current) annual average loadings for flow, biochemical oxygen demand (BOD) (including Soluble), chemical oxygen demand (COD) (including Soluble), total suspended solids (TSS), alkalinity, nitrogen, ammonia, nitrate and nitrite, Total Kjeldahl Nitrogen (TKN), phosphorus, sulfur compounds, and associated flow and load peaking factors for maximum month, peak week and peak day.
- Evaluate and include in projected future waste loads the impacts of current un-sewered population and the result of water conservation and lower flows.
- Project future facility influent loadings based on projected domestic, City-supplied commercial and industrial loading data and summarize by flow, BOD (including Soluble), COD (including Soluble), TSS, alkalinity, nitrogen, ammonia, nitrate, nitrite, and TKN by annual average, maximum month, peak week and peak day loads for years 2030, 2040, and 2050. Projections will include secondary solids from the RDFWRF, as well as both secondary and primary solids from the WHWRF. City-provided estimates of septage, FROG, and food waste will be incorporated.

- Summarize the findings in a draft TM for the City's review and incorporate the City's comments in the TFMP document.

*Assumptions:*

- City will provide population data and projections for the planning horizon, including identification of un-sewered population.
- City will provide the most recent three (3) years of daily flow/load records along with operations data (monthly reports) from 2012 to current.
- City will provide one (1) week of hourly flow data from the maximum month of flow from the past year.

*Deliverables:*

- Draft Waste Load Review and Projections Technical Memorandum in electronic PDF format

### 230 - Current and Potential Future Regulatory Requirements

Hazen will summarize and define the current and potential future regulations that may affect operations at the City's water reclamation facilities. Hazen will perform the following sub-tasks:

- Review the current effluent discharge operating permit, currently proposed regulations, and how they may affect the future operations.
- Summarize current and anticipated future permit conditions in tabular format with descriptions.
- Provide guidance on necessary process improvements needed to meet requirements throughout the planning period (2024 - 2050).
- Summarize the findings of these sub-tasks in a draft TM for the City's review and incorporate the City's comments in the final TFMP document.

*Deliverables:*

- Draft Regulatory Requirements Technical Memorandum in electronic PDF format

### 240 - Process Treatment Capacity Evaluation

Hazen will review and update the following information as provided in the 2018 Biosolids Master Plan. Hazen will develop long-range process treatment alternative(s) at the RDFWRF and WHWRF to meet the regulatory requirements identified in Task 230 and meet operations treatment goals. Hazen will perform the following sub-tasks:

- Perform computer simulation modeling, using the City's current BioWin models, of the liquid process stream and wastewater treatment process using facility operating records for calibration. Request testing, as needed, to validate existing model calibration.
- Prepare a solids mass balance using the results of the modeling effort.
- Determine the firm hydraulic and solids loading capacity and peak capacity of individual treatment processes using the results of the process models (summarize in tabular format); include redundancy and reliability information/requirements.
- Identify any issues related to water conservation at the facilities (i.e., decreasing flows and increasing loads).
- Identify process deficiencies for the various influent load and regulatory scenarios.
- Prepare a draft TM that describes the findings of this evaluation and incorporate the City's review comments in the final TFMP document.

*Assumptions:*

- Existing BioWin models are calibrated and no additional calibration effort will be required.

*Deliverables:*

- Updated BioWin models
- Draft Process Treatment Capacity Evaluation Technical Memorandum in electronic PDF format

## 250 - Hydraulic Capacity Evaluations

Hazen will review and update the following information as provided in the 2018 Biosolids Master Plan. Hazen will review, validate, and update the existing City hydraulic model for the RDFWRF and WHWRF to reflect current conditions and potential hydraulic limitations based upon the information developed in the Tasks above. Hazen will perform the following sub-tasks:

- Evaluate and validate the existing hydraulic model, determine locations of flow restrictions, and recommend corrective measures to these flow restrictions.
- Include any new process flow elements as a result of the alternative analysis.
- Include all sub-systems impacting the hydraulic and solids loading profile (i.e., equalization basin, internal recirculation systems, etc.).
- Prepare a draft TM that describes the findings of this evaluation and incorporate the City's review comments in the final TFMP document.

*Assumptions:*

- City will provide existing hydraulic models in editable format.
- City will provide record drawings for both RDFWRF and WHWRF.
- City will provide flow data from SCADA during field investigations of hydraulic elevations and control points.
- City will provide survey of hydraulic control points at both RDFWRF and WHWRF.

*Deliverables:*

- Draft Hydraulic Capacity Evaluation Technical Memorandum in electronic PDF format

## 260 - Alternative Process Evaluation

Hazen will develop alternative(s) for meeting the process capacity assessment, regulatory requirements, and potential advanced wastewater treatment needs developed in the previous tasks. Hazen will perform the following sub-tasks:

- Evaluate up to five (5) applicable treatment technologies, including conventional treatment, membrane bioreactors, or other applicable treatment alternatives for discharges and/or potential reclaimed water application(s) at WHWRF via desktop analysis and shortlist three (3) for additional modeling. Evaluate one (1) treatment technology alternative at RDFWRF. Consideration should be given to effluent nitrogen limitations, contaminants of emerging concern (CEC's), endocrine disruptors (ED's), per- and polyfluoroalkyl substances (PFOS/PFAS) and other compounds of concern.
- Evaluate treatment facilities for potential opportunities and uses regarding indirect potable reuse and Advance Water Purification.
- Evaluate the need for increasing capacity of the existing WHWRF and RDFWRF facility processes with other applicable technologies versus the feasibility of upgrading/expanding.
- Evaluate and provide up to three (3) technology and cost comparisons for the WHWRF solids disposal methods (if applicable). Previous studies may be utilized as a reference.

- Develop treatment scenarios for achieving various effluent qualities based on the potential regulations discussed in Task 230 (i.e., effluent nitrogen limitations).
- Develop up to three (3) recommended improvement alternative(s) at WHWRF and one (1) at RDFWRF, including process flow diagrams (PFDs) to appropriate level of detail, and concept site plans for the identified treatment scenarios, to sufficiently verify footprint/space requirements and establish AACE Level 5 cost estimates. Cost estimates shall include capital, operation, and maintenance, as well as City's supplied legal and administrative costs for the alternatives identified. Capital and life-cycle cost analyses will be used to compare costs for the recommended alternatives.
- Prepare detailed phasing plan for the recommended improvement alternative(s) that includes key decision points to meet future capacity needs.
- Prepare a draft TM that describes the alternative(s) and incorporate the City's review comments in the final TFMP document.

*Assumptions:*

- A desktop analysis of five (5) different process train alternatives will be considered for evaluation at WHWRF, and three (3) process train alternatives will be shortlisted for additional modeling. One (1) process train alternative will be evaluated at RDFWRF.
- Cost estimates for up to three (3) alternatives at WHWRF and one (1) alternative at RDWRF shall be developed and accuracy shall comply with Level 5 standards as defined by the Association for Advancement of Cost Estimating International (AACE), which are appropriate for preliminary-level planning work.

*Deliverables:*

- Draft Alternative Process Evaluation (RDFWRF and WHWRF) Technical Memorandum in electronic PDF format

270 - SCADA/Controls Evaluation

Hazen will assess the SCADA system and its components for the purpose of evaluation. Hazen will perform the following sub-tasks:

- Verify existing network documentation to the actual network through visual assessment, interview with city SCADA staff and review of communication configuration within the PLC programming. This network assessment shall be documented in the form of a block network diagram. Recommendations of improvements to the network will be prioritized and included in the final report.
- Verify control cabinets at the two facilities comply with the current City of Flagstaff Specification and Standard as they exist at the time of the Assessment. Including Programming standards. Current specifications and standards shall be discussed with SCADA Staff before and during the Assessment. This Control and Programming assessment shall identify control cabinets or SCADA nodes/devices that do not meet the Standard or specifications. Recommendations of improvements to control cabinets and SCADA nodes/devices will be prioritized and included in the final report.
- Review the City's current equipment, programming, and alarm Tag naming conventions. Hazen will review Tag naming assessment and make recommendation for naming configurations methodology, and improvements as needed. Recommendations of improvements to the Tag naming conventions will be included in the final report.
- Review the City's SCADA alarm generating philosophy and methodology. This assessment shall identify a prioritized list of recommendations to include aligning system alarms with specifications and standards and potentially identifying future system alarms required by Operations and

Maintenance staff. Recommendations of improvements to the SCADA alarm system will be included in the final report.

- Verify the Facility SCADA HMI is implemented within the Water Services specifications and standards. Hazen will assess the SCADA HMI and identify a prioritized plan to upgrade and update the software, hardware, operating system, and physical location of the SCADA HMI. Recommendations of improvements to the SCADA HMI will be included in the final report.
- Verify the historian and reports is implemented within the Water Services specifications and standards. This data and reporting assessment shall include a list of prioritized recommendations for improvements needed in reports and data and develop an implementation plan to address missing reports and data. Hazen shall identify opportunities to automating the generation of these reports.
- Summarize these assessments in a draft TM for the City's review and incorporate the City's review comments in the final TFMP document. Summary will include:
  - SCADA Network Architecture Map
  - Prioritized improvement plan to areas of non-compliance
  - Control Cabinet assessment summary
  - PLC Programming standard summary
  - Prioritized improvement plan for control cabinets, PLC programming of non-compliance, and updated standards
  - Current Tag naming assessment summary
  - Prioritized improvement plan for tagging naming standard and needed improvements throughout the system.
  - SCADA System Alarm Assessment summary
  - Prioritized improvement plan for alarming and updating the City Alarm Strategy and philosophy standard
  - SCADA HMI assessment summary
  - Prioritized improvement plan for SCADA HMI standards, updating software and other SCADA HMI improvements
  - SCADA Data and Reporting summary
  - Prioritized improvement plan for SCADA historian and reporting structure

Project workshops will provide the City's staff the opportunity to review and provide input to assessments as they are developed. The following workshops are envisioned as part of this task:

- SCADA Network Assessment; duration up to four (4) hours
- SCADA Control and Programming; duration up to four (4) hours.
- Up to two (2) SCADA Tag Naming Assessment workshops; duration up to four (4) hours each
- Up to two (2) SCADA System Alarm Assessment workshops; duration up to two (2) hours each
- Up to two (2) SCADA HMI Assessment workshops; duration up to four (4) hours each
- Up to two (2) SCADA Data and Reporting Assessment workshops; duration up to two (2) hours each.

*Assumptions:*

- Hazen will conduct up to five (5) days of site visits to document all nodes in the treatment system to perform a SCADA Network Assessment and Control and Programming Assessment.
- The SCADA Network Assessment will include a visual review of nodes on the system, review of existing network documentation and review of PLC communication configuration within the PLC code. A node shall include major SCADA equipment including PLC(s), Remote Input/Outputs, OIT(s), HMI workstation. Peripheral equipment are not included.

- All programs for Program standards review will be provided by the City. Programming standards review will include review of PLC programming only.
- City shall provide copies of standards and specifications for control cabinets, PLC, OIT, HMI and tagging. If no standards are available Hazen will make recommendations of industry best practices.
- All documented tag lists from equipment, programming (PLC, OIT, and HMI), and alarm tag will be provided by the City for Hazen in a complied .csv digital format.
- City shall provide copies of documented PLC programs and configurations.
- City shall provide copies of documented OIT programs and configurations.
- City shall provide copies of documented HMI programs and configurations.
- Hazen will host up to ten (10) workshops, which shall be held virtually and be no more than 4-hour duration

*Deliverables:*

- Workshop Agenda and Meeting Minutes (up to 10) in electronic PDF format
- Draft SCADA/Controls Evaluation Technical Memorandum in electronic PDF format

280 – Staffing and Training Needs

Hazen will develop a TM to address staffing levels and training plan based on industry standards. Existing operations, future treatment alternatives, and future treatment capacity shall be considered. Hazen will perform the follow sub-tasks:

- Evaluate and verify the existing staffing levels meet the needs of existing operations, if not provide recommendations of staffing levels based on industry standards.
- Evaluate and provide recommendations on staffing levels for treatment alternatives that may be implemented in the future. As appropriate phased staffing level implementation shall be based on selected treatment alternatives and additional capacity of all processes.
- Staffing level recommendations shall also include needed experience and/or expertise (i.e., operations, mechanical, electrical, SCADA, etc.).
- With the staffing challenges for these positions, alternative options may be necessary. Provide recommended alternatives to in-house staffing, such as instrumentation, SCADA, automation, and/or on-call contract services, and associated costs for these services.
- Provide training recommendations for the needed expertise to properly run and operate the City's treatment processes (i.e., operations, mechanical, data analytics, vibration analysis, Citect, electrical, PLC, etc.)
- Prepare a draft TM that describes the City's staffing needs and incorporate the City's review comments in the final TFMP document.

*Assumptions:*

- Starting point of evaluation will be current organizational chart and job descriptions.
- Staffing levels will be evaluated for existing operations, three (3) process train alternatives at WHWRF, and one (1) alternative at RDFWRF.
- Up to two (2) alternatives to in-house staffing will be evaluated.
- Operations is defined as staff required for process monitoring, maintenance, and laboratory analysis.

*Deliverables:*

- Draft Staffing and Training Needs Technical Memorandum in electronic PDF format

## **TASK 300 – FUNDING AND FINANCING**

Hazen will prepare a TM with recommended funding and financing options for upgrading and increasing the capacity of the treatment facilities and/or its individual components based on the City's unique financial characteristics. Hazen shall perform the following sub-tasks:

- Research and identify grant opportunities that may be applicable to design and construction of future treatment upgrade projects identified in the TFMP.
- Identify what phases of projects (planning, design, construction) can be captured within the City's existing and future utility rate structure.
- Identify and explore the benefits and drawbacks of alternative funding options such as Public Private Partnerships, bonds, special taxes, grants, and any other currently available funding sources.
- Prepare a draft TM that describes the City's staffing needs and incorporate the City's review comments in the final TFMP document.

### *Assumptions:*

- Funding support includes guidance and review of up to two (2) applications developed by the City for this project. City will write the grant application(s).

### *Deliverables:*

- Funding and Financing Technical Memorandum

## **TASK 400 - TREATMENT FACILITY MASTER PLAN**

Hazen shall prepare a Treatment Facility Master Plan document presenting and summarizing the results of the investigations, evaluations, and recommendations developed in the preceding tasks. The TFMP shall include explanatory text, illustrative figures, and data tables to summarize the recommendations for improvement. Hazen will perform the following sub-tasks:

- Prepare a draft outline of the TFMP and review the draft with the City's personnel.
- Prepare a Draft TFMP report for the RDFWRF and WHWRF following ADEQ facility planning requirements and any pertinent (e.g., AWWA, WEF) industry good practice guidelines/requirements. This report shall take into consideration current and future projects, phasing as appropriate, project grouping to get an economy of scale, and scheduling to meet the treatment and capacity needs for the City's treatment facilities.
- Incorporate the City's review comments and prepare a Final TFMP including an executive summary.
- Develop a recommended capital improvement plan (CIP) based on the results of hydraulic modeling scenarios, facilities evaluation, and other analyses conducted in previous tasks. Included will be a recommendation of phased approach to treatment improvements throughout the planning period and identification of potential key decision points and response strategies to address alternative regulatory requirements. Hazen shall identify possible flexibility for future regulatory changes including total dissolved solids (TDS), nitrogen, phosphorus, and trace constituent removal. A proposed schedule of the asset condition-driven rehabilitation and replacement (R&R) upgrades and the recommended technology improvements will be integrated into the CIP. All CIP items will be prioritized and tabulated, with costs, into a comprehensive implementation plan.

*Assumptions:*

- Content from technical memoranda developed in Tasks 200 and 300 will be updated and included in the body of the TFMP, superseding the previous working documents delivered to the City.
- Any models, spreadsheets, and any other supporting data shall be provided to the City and shall become the property of the City of Flagstaff.
- Cost estimates' accuracy shall comply with Level 5 standards as defined by the Association for Advancement of Cost Estimating International (AACE), which are appropriate for preliminary-level planning work.
- Capital Improvement Plan format shall consist of a project list with individual project sheets. Each sheet shall include a brief discussion of background and purpose of the project, project description, and cost estimate summary, including project triggers where applicable.

*Deliverables:*

- Outline of Treatment Facility Master Plan in electronic PDF format
- Draft Treatment Facility Master Plan in electronic PDF format, including executive summary, recommended 5- and 10-year capital improvement plan, and technical memoranda as appendices
- Comment log summarizing City review comments and their disposition
- Six (6) printed copies and one (1) editable version of the Final Treatment Facility Master Plan with an executive summary, recommended 5- and 10-year capital improvement plan, and technical memoranda as appendices
- Any models, spreadsheets, and any other supporting data in editable format

## **ALLOWANCE**

The scope, level of effort, and associated cost for additional engineering services, including but not limited to survey and geotechnical services, will be as determined and agreed upon by the City and Hazen before the work is performed.

City will make any pertinent survey information in the City's records for the WHWRF and RDFWRF site available. However, Hazen may provide, if needed, through qualified subconsultants, survey services to support the field investigation and conceptual design. Survey services may include verification of horizontal and vertical control on existing structures and pipelines and confirmation of elevations of weirs and other critical hydraulic controls

## **SERVICES NOT INCLUDED IN SCOPE OF WORK**

The following services have not been included in this scope of work. These services may be provided under additional task order(s) if deemed necessary by the City, and only after approval in writing:

- Public outreach efforts.
- Meetings with regulatory or permitting agencies.
- Calibration of existing BioWin models, incl. development and execution of a sampling protocol.
- Coordination and participation in visits to sites using proposed technologies.
- Design, permitting, or construction phase services for improvements recommended through the course of the study.
- Grant writing services.
- SCADA Equipment Assessment
- CMMS and GIS Assessment

## KEY PERSONNEL

Name	Role	Phone	Email
Hazen			
Curt Courter	Principle in Charge	480-465-4504	ccourter@hazenandsawyer.com
Andrea Odegard-Begay	Project Manager	214-682-4996	aodegardbegay@hazenandsawyer.com
Katie Vanyo	Comprehend Task Lead	480-417-5664	kvanyo@hazenandsawyer.com
Doug Kobrick	Explore Task Lead	480-465-4506	dkobrick@hazenandsawyer.com
Stantec			
Rob McCandless	Principle in Charge/ Converge Task Lead	480-687-6105	rob.mccandless@stantec.com
Naho Garvin	Project Manager	801-617-3215	naho.garvin@stantec.com

No.	Task List	Curt Courter Hazen Principal in Charge \$280/h	Wendell Khunjar Technical Advisor & QA/QC \$280/h	Andrea Odegard-Begay Project Manager \$260/h	Katie Vanyo Comprehend Phase Task Lead \$240/h	Pouya Shahsana Structural Engineer \$210/h	Alec Hanson Facility Assessment \$180/h	Lindsey Bennet Process Modeling \$180/h	Riley Murnane Principle Engineer \$180/h	Jacob Mitten-Thomsen Assistant Engineer \$145/h	Doug Kobrick Explore Phase Task Lead \$280/h	Chris Currier Construction Cost Estimating \$240/h	Jason Joynes Staffing Analysis and Training \$185/h	Troy Walker Membrane Bioreactor Operations \$280/h	Klint Fletcher SCADA Evaluation and Standardization \$280/h	Jason Hoyt SCADA Evaluation and Standardization \$240/h	Adam Butts &C Engineer \$240/h	Rob McCandless Converge Phase Task Lead \$285/h	Kevin Daniels Implementation \$210/h	Heather Tugaoen Regulatory Outlook \$210/h	Steve Winfree Solids Handling \$260/h	Kenny Chen Implementation \$210/h	Kahao Lim Implementation \$180/h	Carol Malesky CIP Development and Financing \$280/h	Amy Broughton Funding \$260/h	Kyleen Marcella Advanced Treatment \$210/h	Corey Callaway Electrical \$210/h	Johnathan Muthart SCADA/I&C \$210/h	Chris Machado Technical Advisor & QA/QC \$285/h	Naho Garvin Stantec Project Manager \$210/h	TOTAL HOURS	LABOR FEES	EXPENSES	TOTAL		
<b>TASK 100 – PROJECT MANAGEMENT &amp; MEETINGS</b>		6	40	108	40	0	0	0	0	12	8	0	0	8	22	0	0	48	45	9	6	0	12	0	6	8	0	0	64	42	438	\$ 121,980	\$ 5,400	\$ 127,380		
110	Project Management	6		6						12								6														18	\$ 6,210		\$ 6,210	
120	Progress Meetings			6	2													6	9	9											46	\$ 9,830		\$ 9,830		
130	Project Workshops			72	30						6				6			24	36		6										198	\$ 48,960	\$ 5,400	\$ 54,360		
140	Quality Management		40										8	16				12								8		64		108	\$ 41,260		\$ 41,260			
150	Project Control and Reporting			22																											46	\$ 10,760		\$ 10,760		
160	Project Closeout			2	8																									12	\$ 4,960		\$ 4,960			
<b>TASK 200 - EVALUATIONS AND TECHNICAL MEMORANDA</b>		0	40	48	36	48	120	120	0	212	24	50	80	8	80	340	273	18	112	40	28	50	418	0	0	0	62	62	0	0	2229	\$ 477,730	\$ 10,600	\$ 488,330		
210	Facilities Site Evaluation/Reliability Criteria			6		48	120			40		18	40				48		26				26				18	18			408	\$ 79,980	\$ 10,600	\$ 90,580		
220	Waste Load Review and Projections			6						4								4	34				70								118	\$ 23,020		\$ 23,020		
230	Current and Potential Future Regulatory Requirements			6						4										40											50	\$ 10,540		\$ 10,540		
240	Process Treatment Capacity Evaluation		20	6	12			60		4								4	20				50								156	\$ 35,760		\$ 35,760		
250	Hydraulic Capacity Evaluations			6						4								2	32				132								176	\$ 33,190		\$ 33,190		
260	Alternative Process Evaluation		20	12	24			60		140	24	32						8			28	50	140			44	44			606	\$ 123,720		\$ 123,720			
270	SCADA/Controls Eval									4				80	340	225															649	\$ 158,580		\$ 158,580		
280	Staffing and Training Needs			6						12			40	8																	66	\$ 12,940		\$ 12,940		
<b>TASK 300 – FUNDING AND FINANCING</b>		0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	36	148	0	0	0	0	0	192	\$ 50,740	\$ -	\$ 50,740		
310	Evaluate Funding and Financing Opportunities			2														2					18	80							102	\$ 26,930		\$ 26,930		
320	Funding and Financing TM			2														2					18	68							90	\$ 23,810		\$ 23,810		
<b>TASK 400 - WASTEWATER TREATMENT MASTER FACILITY PLAN</b>		0	0	12	12	0	12	56	0	100	0	0	0	0	12	56	0	10	14	32	14	18	18	0	18	0	22	18	16	16	456	\$ 93,710	\$ 2,000	\$ 95,710		
410	Draft Plan			8	8		8	40		60					8	40		8	6	24	6	18	18		16		20	16	16	336	\$ 69,980		\$ 69,980			
420	Final Plan			4	4		4	16		40					4	16		2	8	8	8	8		2		2	2	2	120	\$ 23,730	\$ 2,000	\$ 25,730				
<b>ALLOWANCE</b>																																		\$ 30,000		\$ 30,000
<b>TOTAL:</b>		6	80	172	88	48	132	176	0	324	32	50	80	16	114	396	273	80	171	81	48	68	448	36	172	8	84	80	80	58	3315	\$ 744,160	\$ 18,000	\$ 792,160		

## EXHIBIT B

### STANDARD TERMS AND CONDITIONS

(Last Updated January 19, 2023)

\*The term "Contractor" may substitute for the term "vendors," "consultants," or "firms," depending on the purpose of the underlying Contract.

#### IN GENERAL

1. **PARTIES:** The City of Flagstaff ("City") and the contractor identified in the Contract ("Contractor") may be referred to individually as "Party" or collectively as "Parties".
2. **NOTICE TO PROCEED:** Contractor shall not commence performance until after the City has issued a Notice to Proceed.
3. **LICENSES AND PERMITS:** Contractor its expense shall maintain current federal, state, and local licenses, permits and approvals required for performance of the Contract and provide copies to City upon request.
4. **COMPLIANCE WITH LAWS:** Contractor shall comply with all applicable federal, state and local laws, regulations, standards, codes and ordinances in performance of the Contract.
5. **NON-EXCLUSIVE:** Unless expressly provided otherwise in the Contract, the Contract is non-exclusive and the City reserves the right to contract with others for materials or services.
6. **SAMPLES:** Any sample submitted to the City by the Contractor and relied upon by City as representative of quality and conformity, shall constitute an express warranty that all materials and/or service to be provided to City shall be of the same quality and conformity.

#### MATERIALS

7. [Reserved]
8. [Reserved].
9. **ACCEPTANCE:** All materials and services provided by Contract are subject to final inspection and acceptance by the City. Materials and services failing to conform to the Contract specifications may be rejected in whole or part. If rejected, Contractor is responsible for all costs associated arising from rejection.
10. [Reserved].

11. [Reserved].
12. [Reserved].
13. [Reserved].
14. [Reserved].
15. [Reserved].
16. [Reserved].
17. [Reserved].

## **PAYMENT**

18. **INVOICES:** A separate invoice shall be issued for each shipment and each job completed. Invoices shall include the Contract and/or Purchase Order number and dates when goods had been shipped or work performed. Invoices shall be sent within thirty (30) days following performance. Payment will only be made for satisfactory materials and/or services received and accepted by City.
19. **LATE INVOICES:** The City may deduct up to 10% of the payment price for late invoices. The City operates on a fiscal year budget, from July 1 through the following June 30. Except in unusual circumstances, which are not due to the fault of Contractor, the City will not honor any invoices or claims submitted after August 15 for materials or services supplied in the prior fiscal year.
20. **TAXES:** Contractor shall be responsible for payment of all taxes including federal, state, and local taxes related to or arising out of Contractor's performance of the Contract. Such taxes include but are not limited to federal and state income tax, social security tax, unemployment insurance taxes, transaction privilege taxes, use taxes, and any other taxes or business license fees as required.  
  
Exception: The City will pay any taxes which are specifically identified as a line-item dollar amount in the Contractor's bid, proposal, or quote, and which were considered and approved by the City as part of the Contract award process. In this event, taxes shall be identified as a separate line item in Contractor's invoices.
21. **FEDERAL EXCISE TAXES:** The City is exempt from paying certain Federal Excise Taxes and will furnish an exemption certificate upon request.
22. **FUEL CHARGES:** Contractor at its own expense is liable for all fuel costs related to performance. No fuel surcharges will be accepted or paid by the City.
23. **DISCOUNTS:** If the Contract provides for payment discounts, payment discounts will be computed from the later date of the following: (a) when correct invoice is received by the City; or (b) when acceptable materials and/or materials were received by the City.
24. **AMOUNTS DUE TO THE CITY:** Contractor must be current and remain current in all obligations due to the City during performance. Payments to Contractor may be offset by any delinquent amounts due to the City or fees and charges owed to the City under the Contract.

25. **OFAC:** No payments may be made to any person in violation of Office of Foreign Assets Control regulations. 31 C.F.R. Part 501.

## **SERVICES**

26. **INDEPENDENT CONTRACTOR:** Contractor shall be an independent contractor for purposes of all laws, including but not limited to the Fair Labor Standards Act, Federal Insurance Contribution Act, Social Security Act, Federal Unemployment Tax Act, Internal Revenue Code, Immigration and Naturalization Act; Arizona revenue and taxation, workers' compensation, and unemployment insurance laws.
27. **CONTROL:** Contractor shall be responsible for the control of the work.
28. **WORK SITE:** Contractor shall inspect the work site and notify the City in writing of any deficiencies or needs prior to commencing work.
29. **SAFEGUARDING PROPERTY:** Contractor shall be responsible for any damage to real property of the City or adjacent property in performance of the work and safeguard the worksite.
30. **QUALITY:** All work shall be of good quality and free of defects, performed in a diligent and professional manner. The standard of care for Contractor under this Contract will be the care and skill ordinarily used by members of the design and engineering profession performing similar services under similar conditions.
31. **ACCEPTANCE:** If the City rejects Contractor's work due to noncompliance with the Contract, the City, after notifying Contractor in writing, may require Contractor to correct the deficiencies at Contractor's expense, or cancel the work order and pay Contractor only for work properly performed as set forth in this Agreement.
32. **[Reserved].**

## **INSPECTION, RECORDS, ADMINISTRATION**

33. **RECORDS:** The City shall have the right to inspect and audit all Contractor books and records related to the Contract for up to five years after completion of the Contract.
34. **RIGHT TO INSPECT BUSINESS:** The City shall have the right to inspect the place of business of the Contractor or its subcontractor during regular business hours at reasonable times, to the extent necessary to confirm Contract performance.
35. **PUBLIC RECORDS:** The Contract and any related materials are a matter of public record and subject to disclosure pursuant to Arizona Public Records Law, A.R.S. § 39-121 et seq. If Contractor has clearly marked its proprietary information as "confidential", the City will endeavor to notify Contractor prior to release of such information.
36. **CONTRACT ADMINISTRATION:** Contractor will be required to participate in the City's contract administration process. Contractor will be closely monitored for Contract compliance and will be required to promptly correct any deficiencies.

## **INDEMNIFICATION**

37. **GENERAL INDEMNIFICATION:** Except as prohibited by A.R.S. 34-226, Contractor shall

indemnify and hold the City, and its officers, agents, employees, and subcontractors, harmless from and against any third-party claims, actions, liabilities, costs, including reasonable attorneys' fees and other costs of defense, arising out of the acts, errors, or omissions of Contractor, its officers, agents, employees, and subcontractors, in performing or failing to perform the responsibilities identified in the Contract. In the event any such action or claim is brought against the City, Contractor shall, if the City so elects, and upon tender by the City: (a) defend the same at Contractor's sole cost and expense; and/or (b) promptly satisfy any judgment adverse to the City; or (c) reimburse the City for any loss, cost, damage, or expense, including attorneys' fees, suffered or incurred by the City. The City shall notify Contractor, within a reasonable time, of any claim, threat of claim, or legal action as it relates to the responsibilities identified in the Contract. This indemnification shall survive termination or expiration of the Contract.

**38. INTELLECTUAL PROPERTY INDEMNIFICATION:** Except as prohibited by A.R.S. 34-226, Contractor shall indemnify and hold the City, and its officers, agents, employees, and subcontractors, harmless from and against any third-party claims, actions, liabilities, costs, including reasonable attorneys' fees and other costs of defense arising out of the alleged infringement of any patent, trademark or copyright or other proprietary rights of any third-parties arising out of Contract performance or use by the City of materials furnished or work performed under the Contract. In the event any such action or claim is brought against the City, Contractor shall, if the City so elects and upon tender by the City: (a) defend the same at Contractor's sole cost and expense; and/or (b) promptly satisfy any judgment adverse to the City; or (c) reimburse the City for any loss, cost, damage, or expense, including attorneys' fees, suffered or incurred by the City. The City shall notify Contractor, within a reasonable time, of any claim, threat of claim, or legal action as it relates to the responsibilities identified in the Contract. This indemnification shall survive termination or expiration of the Contract.

**39. NETWORK SECURITY AND PRIVACY LIABILITY:** Except as prohibited by A.R.S. 34-226, Contractor shall indemnify and hold the City, and its officers, agents, employees, and subcontractors, harmless from an against any third-party claims, actions, liabilities, costs, including reasonable attorneys' fees and other costs of defense arising out of all acts, errors, omissions, negligence, infringement of intellectual property (except patent and trade secret); network security and privacy risks, including but not limited to unauthorized access, failure of security, breach of privacy perils, wrongful disclosure, collection, or other negligence in the handling of confidential information, privacy perils, and including coverage for related regulatory defense and penalties; data breach expenses, including but not limited to, consumer notification, whether or not required by law, computer forensic investigations, public relations and crisis management firm fees, credit file or identity monitoring or remediation services in the performance of services for the City. In the event any such action or claim is brought against the City, Contractor shall, if the City so elects and upon tender by the City: (a) defend the same at Contractor's sole cost and expense; and/or (b) promptly satisfy any judgment adverse to the City; or (c) reimburse the City for any loss, cost, damage, or expense, including attorneys' fees, suffered or incurred by the City. The City shall notify Contractor, within a reasonable time, of any claim, threat of claim, or legal action as it relates to the responsibilities identified in the Contract. This indemnification shall survive termination or expiration of the Contract.

### **CONTRACT CHANGES**

**40. PRICE INCREASES:** Except as expressly provided for in the Contract, no price increases will be approved.

**41. COMPLETE AGREEMENT:** The Contract is intended to be the complete and final agreement

of the Parties.

42. **AMENDMENTS:** The Contract may be amended by written agreement of the Parties.
43. **SEVERABILITY:** If any term or provision of the Contract is found by a court of competent jurisdiction to be illegal or unenforceable, then such term or provision is deemed deleted and the remainder of the Contract shall remain in full force and effect.
44. **NO WAIVER:** Both Parties have the right insist upon strict performance of the Contract, and the prior failure of a Party to insist upon strict performance, or a delay in any exercise of any right or remedy, or acceptance of materials or services, shall not be deemed a waiver of any right to insist upon strict performance.
45. **ASSIGNMENT:** Contractor was selected for its special knowledge, skills, and expertise, and shall not assign the services/materials required in the Contract, in whole or in part, without the City's prior written consent, which may be withheld for any reason. Any assignment without such consent shall be null and void. No assignment shall relieve Contractor (Assignor) from any of its obligations and liabilities under the Contract with respect to the City. The Purchasing Director shall have authority to consent to an assignment on behalf of the City.
46. **BINDING EFFECT:** The Contract shall be binding upon and inure to the benefit of the Parties and their successors and assigns.

#### **EMPLOYEES AND SUBCONTRACTORS**

47. **SUBCONTRACTING:** Contractor was selected for its special knowledge, skills, and expertise, and shall not assign the services/materials required in the Contract, in whole or in part, without the City's prior written consent, which may be withheld for any reason. The City reserves the right to withhold consent if the subcontractor is deemed irresponsible and/or subcontracting may negatively affect performance. All subcontracts shall comply with the underlying Contract. Contractor is responsible for Contract performance whether or not subcontractors are used.
48. **NONDISCRIMINATION:** Contractor shall not discriminate against any employee or applicant for employment or person to whom it provides services because of race, color, religion, sex, national origin, disability, genetic information, veteran's status, pregnancy, familial status and represents and warrants that it complies with all applicable federal, state and local laws and executive orders regarding employment. In addition, any Contractor whose business is located within City of Flagstaff limits shall comply with the City Code, Chapter 14-02, *Civil Rights*, which also prohibits discrimination based on sexual orientation, or gender identity or expression.
49. **DRUG FREE WORKPLACE:** The City has adopted a Drug Free Workplace policy for itself and those doing business with the City to ensure the safety and health of all persons working on City contracts and projects. Contractor's personnel shall abstain from use or possession of illegal drugs while engaged in performance of the Contract.
50. **IMMIGRATION LAWS:** Pursuant to A.R.S. § 41-4401, Contractor hereby warrants to the City that Contractor and each of its subcontractors shall comply with all state and federal immigration laws and regulations that relate to its employees and A.R.S. § 23-214(A). A breach of state and federal immigration laws and regulations shall constitute a material breach of the Contract and shall subject Contractor to penalties up to and including termination of the Contract. The City may, at its sole discretion, conduct random verification of the employment records of the

employees of the Contractor and any subcontractors to ensure compliance with all state and federal immigration laws and regulations. Neither Contractor nor any subcontractor shall be deemed to have materially breached the Contract if Contractor or subcontractor establishes that it has complied with the employment verification provisions prescribed by sections 274A and 274B of the Federal Immigration and Nationality Act and the E-verify requirements prescribed by A.R.S. § 23-214(A).

## **DEFAULT AND TERMINATION**

- 51. TERMINATION FOR DEFAULT:** Prior to terminating the Contract for a material breach, the non-defaulting Party shall give the defaulting Party written notice and reasonable opportunity to cure the default, not to exceed thirty (30) days unless a longer period of time is granted by the non-defaulting Party in writing. In the event the breach is not timely cured, or in the event of a series of repeated breaches the non-defaulting Party may elect to terminate Contract by written notice to the defaulting party, which shall be effective upon receipt. In the event of default, the Parties may execute all remedies available at law in addition to the Contract remedies provided for herein.
- 52. CITY REMEDIES:** In the event of Contractor's default, the City may obtain required materials and/or services from a substitute contractor, and Contractor shall be liable to the City to pay for the costs of such substitute service. The City may deduct or offset the cost of substitute service from any balance due to Contractor, and/or seek recovery of the costs of substitute service against any performance security, and/or collect any liquidated damages provided for in the Contract. Remedies herein are not exclusive.
- 53. CONTRACTOR REMEDIES:** In the event of the City's default, Contractor may pursue all remedies available at law, except as provided for herein.
- 54. TERMINATION FOR NONAPPROPRIATION OF FUNDS:** The City may terminate all or a portion of the Contract due to budget constraints and non-appropriation of funds for the following fiscal year, without penalty or liability to Contractor.
- 55. TERMINATION FOR CONVENIENCE:** Unless expressly provided for otherwise in the Contract, the Contract may be terminated in whole or part by the City for convenience upon thirty (30) days written notice, without further penalty or liability to Contractor. If the Contract is terminated, City shall be liable only for payment for satisfactory materials and/or services received and accepted by the City before the effective date of termination.
- 56. TERMINATION DUE TO INSOLVENCY:** If Contractor becomes a debtor in a bankruptcy proceeding, or a reorganization, dissolution or liquidation proceeding, or if a trustee or receiver is appointed over all or a substantial portion of the property of Contractor under federal bankruptcy law or any state insolvency law, Contractor shall immediately provide the City with a written notice thereof. The City may terminate the Contract, and Contractor is deemed in default, at any time if the Contractor becomes insolvent, or is a party to any voluntary bankruptcy or receivership proceeding, makes an assignment for a creditor, or there is any similar action that affects Contractor's ability to perform under the Contract.
- 57. PAYMENT UPON TERMINATION:** Upon termination of the Contract, the City will pay Contractor for satisfactory performance up until the effective date of termination. The City shall make final payment within thirty (30) days from receipt of the Contractor's final invoice.
- 58. CANCELLATION FOR GRATUITIES:** The City may cancel the Contract at any time, without

penalty or further liability to Contractor, if City determines that Contractor has given or offered to give any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a public servant in connection with award or performance of the Contract.

- 59. CANCELLATION FOR CONFLICT OF INTEREST:** Pursuant to A.R.S. § 38-511, if the City identifies a conflict of interest in the award or performance of the Contract, the City may cancel the Contract within three years after its execution, without penalty or further liability to Contractor.

## **MISCELLANEOUS**

- 60. COOPERATIVE PURCHASE CONTRACTS:** Presuming that Contractor agreed to such during the procurement process, Contractor will enter into cooperative purchase arrangements, as sanctioned by state and federal law, to allow Contractor to sell materials and services to any member of a cooperative group under the same pricing, terms and conditions of the contract awarded to the Contractor by the public procurement unit, following a competitive procurement process.
- 61. ADVERTISING:** Contractor shall not advertise or publish information concerning its Contract with the City without the prior written consent of the City.
- 62. NOTICES:** All notices given pursuant to the Contract shall be delivered at the addresses as specified in the Contract or updated by Notice to the other Party. Notices may be: (a) personally delivered, with receipt effective upon personal delivery; (b) sent via certified mail, postage prepaid, with receipt deemed effective four days after being sent; or (c) sent by overnight courier, with receipt deemed effective two days after being sent. Notice may be sent by email as a secondary form of notice.
- 63. THIRD PARTY BENEFICIARIES:** The Contract is intended for the exclusive benefit of the parties. Nothing herein is intended to create any rights or responsibilities to third parties.
- 64. GOVERNING LAW:** The Contract shall be construed in accordance with the laws of Arizona.
- 65. FORUM:** In the event of litigation relating to the Contract, any action at law or in equity shall be filed in Coconino County, Arizona.
- 66. ATTORNEYS' FEES:** If any action at law or in equity is necessary to enforce the terms of the Contract, the prevailing party shall be entitled to recover its reasonable attorneys' fees, costs, professional fees and expenses.
- 67. FORCE MAJUERE:**
- a. There may be events that occur during the term of the Contract that are beyond the control of both the City and Contractor, including events of war, floods, labor, disputes, earthquakes, epidemics, pandemics, adverse weather conditions not reasonably anticipated, forest fires, and other acts of God ("Events"). These Events may result in a temporary delay of contractual deliverables, or the permanent inability to provide the contractual deliverables that are the subject of the Contract.
  - b. There shall be no claims arising from a temporary delay of contractual deliverables, or the

permanent inability to provide the contractual deliverables caused by the Events and the City shall not pay additional costs incurred by Contractor as a result of such Events.

- c. The Parties shall act in good faith to extend the Contract completion date without any penalty to Contractor and that the extension will be in an amount of time equal to any temporary delay. This provision of the Contract supersedes all other terms regarding temporary delay, permanent shut down, or increased costs.
- 68. NO BOYCOTT OF ISRAEL:** Pursuant to A.R.S. §§ 35-393 and 35-393.01, if a Party has over ten (10) employees and the Contract is worth at least one-hundred thousand dollars and no cents (\$100,000), the Party shall certify that it is not currently engaged in, and agrees, for the duration of the Contract, will not engage in a boycott of Israel.
  - 69. CHANGES TO CONTRACT:** The Contract shall not be modified within the first year after Contract award where: (a) an amendment may result in a competitive advantage that was not made available to other proposers/bidders; or (b) requests for changes may delay commencement of performance.
  - 70. FORCED LABOR OF ETHNIC UYGHURS:** If Contractor engages in for-profit activity and has ten (10) or more employees, pursuant to A.R.S. §35-394, the Contractor certifies that it does not currently, and agrees for the duration of the contract that it will not, use: 1) the forced labor of ethnic Uyghurs in the People's Republic of China; 2) any goods or services produced by the forced labor of ethnic Uyghurs in the People's Republic of China; and 3) any contractors, subcontractors or suppliers that use the forced labor or any goods or services produced by the forced labor of ethnic Uyghurs in the People's Republic of China. If the Contractor becomes aware during the term of the contract that the company is not in compliance with the written certification, the Contractor shall notify the City within five (5) business days after becoming aware of the noncompliance. If the Contractor does not provide the City with a written certification that the Contractor has remedied the noncompliance within 180 days after notifying the City of the noncompliance, this Contract terminates, except that if the contract termination date occurs before the end of the remedy period the Contract terminations on the Contract termination date.

**EXHIBIT C**

**STANDARD INSURANCE REQUIREMENTS**

(Last Updated January 19, 2023)

\*The term "Contractor" may substitute for the term "vendors," "consultants," or "firms," depending on the purpose of the underlying Contract.

1. **IN GENERAL:** Contractor shall maintain insurance against claims for injury to persons or damage to property, arising from performance of or in connection with the Contract by Contractor, its agents, representatives, employees, and/or subcontractors.
2. **REQUIREMENT TO PROCURE AND MAINTAIN:** Each insurance policy required by the Contract shall be in effect at, or before, commencement of work under the Contract and shall remain in effect until all of Contractor's obligations under the Contract have been met, including any warranty periods. Contractor's failure to maintain the insurance policies as required by the Contract, or to provide timely evidence of renewal, will be considered a material breach of the Contract.
3. **MINIMUM SCOPE AND LIMITS OF INSURANCE:** The following insurance requirements are minimum requirements for the Contract and in no way limit the indemnity covenants contained in the Contract. The City does not represent or warrant that the minimum limits set forth in the Contract are sufficient to protect Contractor from liabilities that might arise out of the Contract, and Contractor is free to purchase such additional insurance as Contractor may determine is necessary.

Where applicable, as related to the Scope of Work, Contractor shall provide coverage at least as broad and with limits not less than those stated below.

a. Commercial General Liability - Occurrence Form	
General Aggregate	\$2,000,000
Products/Completed Operations	\$1,000,000
Each Occurrence	\$1,000,000
b. Umbrella Coverage	\$2,000,000
c. Automobile Liability	
Any Automobile or Owned, Hired, and Non-owned Vehicles	\$1,000,000
Combined Single Limit Per Accident for Bodily Injury & Property Damage	
d. Workers' Compensation and Employer's Liability	
Workers' Compensation	Statutory
Employer's Liability: Each Accident	\$1,000,000
Disease - Each Employee	\$1,000,000
Disease - Policy Limit	\$1,000,000
e. Professional Liability	\$2,000,000

f. Network Security and Privacy Liability

Per claim	\$2,000,000
Annual Aggregate	\$2,000,000

4. **NETWORK SECURITY AND PRIVACY LIABILITY:** Contractor shall maintain the requisite insurance requirements covering all acts, errors, omissions, negligence, infringement of intellectual property (except patent and trade secret); network security and privacy risks, including but not limited to unauthorized access, failure of security, breach of privacy perils, wrongful disclosure, collection, or other negligence in the handling of confidential information, privacy perils, and including coverage for related regulatory defense and penalties; data breach expenses, including but not limited to, consumer notification, whether or not required by law, computer forensic investigations, public relations and crisis management firm fees, credit file or identity monitoring or remediation services in the performance of services for the City. The insurance policy shall include coverage for third-party claims. The insurance policy shall contain an affirmative coverage grant for contingent bodily injury.
5. **SELF-INSURED RETENTION:** Any self-insured retentions must be declared to and approved by the City. If not approved, the City may require that Contractor reduce or eliminate such self-insured retentions with respect to the City, its officers, agents, employees, and/or subcontractors. Contractor shall be solely responsible for any self-insured retention amounts. The City at its option may require Contractor to secure payment of such self-insured retention by a surety bond or irrevocable and unconditional letter of credit.
6. **OTHER INSURANCE REQUIREMENTS:** The insurance policies shall contain, or be endorsed to contain, the following provisions:
- a. Additional Insured: In Commercial General Liability and Automobile Liability Coverages, the City of Flagstaff, its officers, officials, agents, employees, and/or subcontractors shall be named and endorsed as additional insureds with respect to liability arising out of the Contract and activities performed by or on behalf of Contractor, including products and completed operations of Contractor, and automobiles owned, leased, hired, or borrowed by Contractor.
  - b. Broad Form: Contractor's insurance policy shall contain broad form contractual liability coverage.
  - c. Primary Insurance: Contractor's insurance coverage shall be primary insurance with respect to the City, its officers, officials, agents, employees, and/or subcontractors. Any insurance or self-insurance maintained by the City, its officers, officials, agents, employees, and/or subcontractors shall be in excess of the coverage of Contractor's insurance and shall not contribute to it.
  - d. Each Insured: Contractor's insurance policies shall apply separately to each insured against whom a claim is made or suit is brought, except Professional Liability and Cyber Liability.
  - e. Not Limited: Coverage provided by Contractor shall not be limited to the liability assumed under the indemnification provisions of the Contract.

- f. Waiver of Subrogation: The insurance policies shall contain a waiver of subrogation against the City, its officers, officials, agents, employees, and/or subcontractors for losses arising from work performed by Contractor for the City.
7. **NOTICE OF CANCELLATION**: Each insurance policy required by the insurance provisions of the Contract shall provide the required coverage and shall not be suspended, voided, cancelled, and/or reduced in coverage or in limits unless prior written notice has been given to the City. Notices required by this section shall be sent directly to the Procurement Agent and shall reference the Contract Number.
8. **ACCEPTABILITY OF INSURERS**: Contractor shall place insurance hereunder with insurers duly licensed or approved unlicensed companies in the State of Arizona and with a “Best’s” rating of not less than A-: VII. The City does not represent or warrant that the above required minimum insurer rating is sufficient to protect Contractor from potential insurer insolvency.
9. **CERTIFICATES OF INSURANCE**: Contractor shall furnish the City with certificates of insurance (ACORD form) as required by the Contract. The certificates for each insurance policy shall be signed by a person authorized by that insurer to bind coverage on its behalf. Any policy endorsements that restrict or limit coverage shall be clearly noted on the certificate of insurance. The City Contract number shall be noted on the certificates of insurance. If requested by the City, all certificates of insurance and endorsements must be received and approved by the City before the Contractor commences work.
10. **POLICIES**: The City reserves the right to require, and receive within ten (10) days, complete, certified copies of all insurance policies and endorsements required by the Contract. The City shall not be obligated, however, to review any insurance policies or to advise Contractor of any deficiencies in such policies and endorsements. The City’s receipt of Contractor’s policies or endorsements shall not relieve Contractor from, or be deemed a waiver of, the City’s right to insist on strict fulfillment of Contractor’s obligations under the Contract.
11. **MODIFICATIONS**: Any modification or variation from the insurance requirements in the Contract must have the prior approval of the City’s Attorney’s Office in consultation with the City’s Risk Manager, whose decision shall be final. Such action will not require a formal Contract amendment but may be made by their handwritten revision and notation to the foregoing insurance requirements.

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Jarrett Nelson, Public Works Project Manager  
**Co-Submitter:** Marshall Ronningen  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



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**TITLE:**

**Consideration and Approval of Contract:** Cooperative Purchase Contract with Pueblo Mechanical and Controls, LLC in the amount of \$599,833.26 for chiller replacement in City Hall.

**STAFF RECOMMENDED ACTION:**

1. Approve the Cooperative Purchase Contract with Pueblo Mechanical and Controls, LLC ("Pueblo") in the amount of \$599,833.26 for chiller replacement in City Hall; and
2. Authorize the City Manager to execute the necessary documents.

**Executive Summary:**

The City Hall building houses numerous City offices, provides service counters to the public and houses the City Council Chambers. This entire building is currently cooled by one (1), nearly 20-year-old, 140 Ton Chiller, that is beyond its service lifespan. The unit utilizes outdated R-22 refrigerant and has numerous issues which make it ineffective in cooling the building. If the old unit fails during the summer heat, the City Hall building does not have any other cooling source to provide back up and would get warm during the day. This would disrupt staff's ability to provide essential services to the community. This City Council action, if approved, will allow the facilities team to deliver the replacement project with Pueblo to remove and replace the existing failing chiller with two (2)-71 ton chillers, condensers and related plumbing/mechanical work.

**Financial Impact:**

This project was not budgeted as part of the FY2024-25 budget. However, a request was submitted to Budget Team for consideration and Budget Team supported this request and the use of the General Fund Infrastructure Reserve Fund to fund this project.

Project Name: City Hall Chiller Replacement  
Cost: \$599,833.26  
Account Number Budgeted: 001-09-402-1310-1-4405  
FY Budgeted Amount: \$2,113,260  
Grant Funded: No  
Funding Source: General Fund Infrastructure Reserve

**Policy Impact:**

The award of this Cooperative Purchase Contract will renew existing City infrastructure and allow City staff to continue serving the community.

**Previous Council Decision or Community Discussion:**

No.

**Options and Alternatives to Recommended Action:**

1. Approve the Cooperative Purchase Contract with Pueblo for \$599,833.26, as proposed using the Mohave Educational Services Cooperative Purchase Contract 19F-PMAC2-0904; or
2. Reject the Cooperative Purchase Contract and request that City staff conduct a solicitation for the essential chiller replacement. This option is not recommended by City staff as it would delay replacing failing equipment.

**Background and History:**

The existing chiller was installed new in 2005 and had an approximate service life of 15 Years. It has become problematic over the last 12 months and is being repaired frequently to keep it running. This unit is one of the many, citywide, that continues to use R-22 refrigerant.

The Cooperative Purchase Contract through Contract #19F-PMAC2-0904, Mohave Educational Services Cooperative was vetted by the Purchasing Section to insure the best pricing for this product. Purchasing confirmed that Mohave has performed a proper and competitive formal solicitation with a Request for Qualifications that meets public procurement requirements. Purchasing staff reviewed the agency contract and has determine it relevant to the City's needs for this procurement and that it is currently active.

Due to the large size, Contract #19-PMAC2-0904 has been attached to the staff summary in two parts. You can also access the agency document and award information online through [https://mesc.org/about-vendor%e2%80%8b/?contract\\_id=19F-PMAC2-0904](https://mesc.org/about-vendor%e2%80%8b/?contract_id=19F-PMAC2-0904).

**Connection to PBB Priorities and Objectives:**

High Performing Governance:

1. Deliver quality community assets -- This project will invest in the maintenance and renewal of a community asset to keep it functioning as intended and provide a quality experience to users of the facility.
2. Enhance the organization's fiscal stability & increase efficiency & effectiveness-This project will increase the efficiency and reduce operating costs.

**Connection to Regional Plan:**

Chapter VII Energy:

Goal E.I. Increase Energy Efficiency-The new chillers installed in this project will increase the energy efficiency of the building.

**Connection to Carbon Neutrality Plan:**

1. In January 2020, the Environmental Protection Agency banned the production and import of the coolant R-22 due to its particularly harmful impact to the ozone layer when released into the air. Approving the Cooperative Purchase Contract would upgrade the chemicals used in the chiller.
2. Priority 3-BE 3-Reducing building energy usage including electricity.

**Connection to 10-Year Housing Plan:**

No.

**Connection to Division Specific Plan:**

No.

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**Attachments:**    [2024-193 Pueblo City Hall Chiller](#)  
                          [Exhibit A - Proposal # 2405-28095](#)  
                          [Exhibit B.1 - Contract Amendment Summary](#)  
                          [Exhibit B.2 Agency Contract Package 19F-PMAC2-0904](#)

## COOPERATIVE PURCHASE CONTRACT

Contract No. 2024-193

This Cooperative Purchase Contract is made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ by and between the City of Flagstaff, Arizona, a political subdivision of the State of Arizona ("City") and Pueblo Mechanical and Controls, LLC, an Arizona Limited Liability Company ("Contractor").

### RECITALS:

- A. Contractor is a fully authorized vendor of chiller and boiler maintenance and repair services;
- B. The Mohave Educational Services Cooperative, Procurement Department, Public Sector conducted a competitive and open procurement process through Request for Qualifications Solicitation No. 19F-0808 that resulted in Contract No. 19F-PMAC2-0904 with Contractor ("Agency Contract"); and
- C. The City has authority to enter into a cooperative purchase contract with Contractor utilizing the Agency Contract.

### AGREEMENT:

NOW THEREFORE, in consideration for the mutual promises contained herein, the Parties agree:

1. Materials and or Services Purchased: Contractor shall provide to the City the materials and or services, as specified in the Scope of Work attached as Exhibit A, and in accordance with the Agency Contract. A general description of materials and/or services being purchased is:

#### **CITY OF FLAGSTAFF CITY HALL CHILLER REPLACEMENT**

2. Specific Requirements of City: Contractor shall comply with all specific purchase and delivery requirements and/or options of City, as specified in the Scope of Work attached as Exhibit A and incorporated by reference.
3. Payment: Payment to Contractor for the materials and or services provided for **five hundred ninety-nine thousand eight hundred thirty-three dollars and twenty-six cents (\$599,833.26), in addition to other fees and taxes**; made in accordance with the price list and terms set forth in the Agency Contract.
4. Terms and Conditions of Agency Contract Apply: All provisions of the Agency Contract documents attached as Exhibit B, including any amendments, are incorporated in and shall apply to this Contract as though fully set forth herein. Contractor is responsible for promptly notifying City in writing of any changes to the Agency Contract, including, specifically changes in price for materials and/or services.
5. Certificates of Insurance: All insurance provisions of the Agency Contract shall apply, including any requirement to name the City as an additional insured. Prior to commencing performance under this Contract, Contractor shall furnish City with a copy of the current Certificate of Insurance required by the Agency Contract.

6. Term: This Cooperative Purchase Contract shall commence upon execution by the Parties and shall continue until expiration or termination of the underlying Agency Contract, unless sooner terminated by City in writing.
7. Renewal: This Cooperative Purchase Contract shall be automatically renewed if the underlying Agency Contract is renewed, for the same renewal period, unless City provides advance written notice to Contractor of its intention to non-renew.

**PUEBLO MECHANICAL & CONTROLS, LLC:**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CITY OF FLAGSTAFF**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**ATTEST:**

\_\_\_\_\_  
City Clerk

**APPROVED AS TO FORM:**

\_\_\_\_\_  
City Attorney's Office

Last Updated July 20,2023

**EXHIBIT A**  
**SCOPE OF WORK**  
(attached)

1. Flagstaff City Hall Chiller Replacement Proposal #: 2405-28095

**EXHIBIT B**  
**AGENCY CONTRACT**  
(attached)

1. Agency Contract Package 19F-PMAC2-0904
2. Contract Amendment Summary
3. Contract Pricing

# PROJECT PROPOSAL



SUBMITTED BY PUEBLO MECHANICAL & CONTROLS

**Project Name:** Flagstaff City Hall Chiller Replacement

**Project Site Address:** 211 W Aspen Ave. Flagstaff, AZ

**Customer:** Joe Ronningen – City of Flagstaff

**Proposal #:** 2405-28095

**Contract Type:** MOHAVE #19F-PMAC2-0904

**Date:** 06/06/2024

Pueblo appreciates the opportunity to look at this project and is pleased to provide the following scope for Flagstaff City Hall Chiller Replacement.

- Perform load study on existing electrical panel to ensure, upsizing the bucket will not create an issue. If a larger bucket can not be installed in existing electrical panel additional costs may be incurred.
- Provide Electrical, Mechanical, and Structural engineered drawings for permitting.
- Facilitate permitting process with the City of Flagstaff, all fees to be billed directly to the public work department.
- Lock out and tag out electrical to (1) chiller and (1) remote condenser to make safe for demo.
- Isolate chilled water loops utilizing existing valves.
- Disconnect piping, electrical, and refrigerant lines.
- Demo and environmentally dispose of (1) existing chiller and (1) remote condenser.
- Provide and install (2) new 75 Ton Chillers with Remote Condensers on existing pads:
  - Water Cooled Scroll Chiller Model # 30MPA0806N
  - 460 Volt 3 phase // R-32 Refrigerant
  - Evaporator Isolation with Water Manifold Piping
  - Standard Interrupt
  - Non-Fused Disconnect Switch
  - Hot Gas Bypass
  - Scrolling Marquee Display
  - Height adjustment kit
  - Compressor Sound Blanket
  - Factory Start-up
  - Remote condensers: Model # 09DPM0856
    - Low Sound Fan
    - SCCR 5K
    - Single Point Power, Terminal Block
    - Micro Channel
    - Security Grilles/Hail Guards Only

WWW.PUEBLO-MECHANICAL.COM

# PROJECT PROPOSAL



SUBMITTED BY PUEBLO MECHANICAL & CONTROLS

- This option will match the existing configuration of the chiller while providing redundancy.
- Provide and install new chilled water piping as needed to reconnect new chillers to existing isolation valves.
- Reconnect existing refrigerant venting pipe to new chiller.
- Install insulation on new chilled water piping.
- Provide and install new 400 amp bucket in existing electrical panel.
- Reconnect new electrical panel to new chillers, rework existing conduit as needed.
- *All controls work by others.*
- Start up and test for proper operation.
- Crane and riggings as required.
- 2 year parts and labor warranty.
- Provide owner with operation and maintenance manuals.

### Clarifications:

- There is a 3.2% fee associated with our accepting credit cards for payment
- This project proposal is valid for **30 days**
- All work described above is to be completed during **normal business hours**
- Pueblo will not be held liable for Material and Equipment escalation costs after 30 days of proposal date
- Work to be performed in a single mobilization.

### We Exclude the Following:

- Repair or replacement of any existing device found to be inoperable.
- Utility tap fees, site utilities, meters, and fire protection.
- 3<sup>rd</sup> Party engineering/design review costs and fees.
- Local Utility fees.
- Davis Bacon / Prevailing wages.
- Buy Americas / American act.
- Fire suppression systems.
- Duct smoke detectors and/ or interface with existing fire alarm system.
- Fire and/ or fire smoke dampers.
- Architectural demolition and patching of roof, walls, or ceiling.
- Architectural louvers.
- Seismic restraints.
- BIM or other CAD related modeling or drawings of any kind.
- Formal Commissioning or commissioning assist.
- Asbestos abatement, testing, reporting.
- Arc flash calculations.
- Coordination studies.

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# PROJECT PROPOSAL



SUBMITTED BY PUEBLO MECHANICAL & CONTROLS

## PRICING AND ACCEPTANCE

<b>Material, Service, &amp; Labor Subtotal:</b>		\$	<b>590,968.73</b>
<b>Bonding:</b>	<b>1.50%</b>	\$	<b>8,864.53</b>
<b>Total Cost:</b>		\$	<b>599,833.26</b>

We look forward to providing this important service. Please call if you have any questions.

Best Regards,



**ROSS RISANO**  
PRE-CONSTRUCTION SERVICES

**O:** 800.840.9170  
**C:** 520.404.1702  
**W:** [pueblo-mechanical.com](http://pueblo-mechanical.com)  
**E:** [Ross@pueblo-mechanical.com](mailto:Ross@pueblo-mechanical.com)



**Acceptance of Proposal:** The above prices and specifications are satisfactory and are hereby accepted. Terms & Conditions listed on of this proposal are stated in the Master Agreement of the Cooperative Contract stated in this proposal. You are authorized to do the work as specified.

---

Name \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

Due to the high cost of equipment and/or extended nature of this project progress billing may be required; if a purchase order is created for this project the owner agrees to accept progress billing for demonstrated and verifiable completed work and/or arrival of equipment items pending installation.

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7/25/2023



**Modification of Contract  
(Contract Extension)  
(Page 1 of 3)**

Robert Carr  
Pueblo Mechanical and Controls, LLC.  
6771 E. Outlook Drive  
Tucson, AZ 85756

**RE: Contract # 19F-PMAC2-0904 modification of contract through an extension of contract is made by, and between, Pueblo Mechanical and Controls, LLC. and Mohave Educational Services Cooperative (Mohave).**

In accordance with its terms and conditions, Mohave requests to extend contract 19F-PMAC2-0904 for a period of one (1) year, beginning 9/4/2023. The extension shall be under the same terms and conditions contained therein.

Provide your agreement to extend by completing the appropriate information below and on the following pages. If the contract is extended, Pueblo Mechanical and Controls, LLC. agrees to provide products or prices as per 19F-0808.

By signing this Modification of Contract, you hereby certify to the best of your knowledge and belief that your firm complies with Byrd Anti-Lobbying Amendment 31 U.S. Code § 1352, 2 CFR § 200.450 and Federal Acquisition Regulation 52.203-11

We agree to **modify** and **extend** the contract as specified above, abiding by the current terms and conditions, and any attached clarifications.

Signature *Robert W. Carr* Title *OSM*

Typed/Printed Name *ROBERT W. CARR* Date *8/8/2023*

Upon your signed, executed Modification of Contract through a Contract Extension, you shall be bound to sell the materials and/or services offered to and accepted by Mohave in accordance with the solicitation, including all terms, conditions, specifications, amendments and any accepted written exceptions.

*Nancy D. Colbaugh*

Nancy Colbaugh, CPPB  
Contracts Manager  
Mohave Educational Services Cooperative, Inc.  
625 East Beale Street | Kingman, AZ 86401  
Phone 928-718-3228 | Fax 928-718-3232

**If all pages of this notice are not received at Mohave's Kingman office on, or before, 9/4/2023, orders shall be held without processing. Email or fax completed extension to [contracts@mesc.org](mailto:contracts@mesc.org) or 928-718-3232.**

To terminate the contract effective 9/4/2023, email or fax a notice of your request to cancel the contract to [contracts@mesc.org](mailto:contracts@mesc.org) or 928-718-3232. You agree to complete any authorized work or orders received prior to that date. Renewals not received within 14 days following 9/4/2023 may result in cancellation of the contract. However, any authorized orders received prior to this date, shall be completed under this contracts terms and conditions.

# Modification of Contract (Contract Extension)

(Page 2 of 3)

## Requested Pricing Modifications

We list your contract as utilizing Coefficient applied to UPB, Trade Service (TRA-SER) pricing and some fixed price for professional services.. Please confirm the following regarding pricing under your contract:

Our contract utilized firm-fixed pricing. We agree to hold the current prices until the next contract renewal date of 9/4/2024.

Our contract utilized percentage off MSRP/Retail pricing. The current price lists/catalogs are still applicable.

We are requesting a price modification. A price list/catalog will be submitted by \_\_\_\_\_. (Insert Date)

*Remember that your firm cannot quote any new products contained in pricing submitted with your contract extension until it has been reviewed and a Contract Modification through a pricing update/product addition has been issued. Current contract pricing will remain in effect until this process is complete.*

Please verify that the following information is correct and accurate:

POs Attn: Order Desk  
Pueblo Mechanical and Controls, LLC.  
6771 E. Outlook Drive  
Tucson, AZ 85756

Remit to: Pueblo Mechanical and Controls, LLC.  
Accounts Receivable  
6771 E. Outlook Drive  
Tucson, AZ 85756

Member Contact: Robert Carr  
Contract Administrator: Robert Carr  
Phone Number: 800-840-9170  
Fax Number: 888-473-4374

## **Vendor Logo**

Currently, we have the following logo on file for use on our website in our product/vendor finder:



If you wish to revise or update the logo we have on file, keep the following requirements in mind:

- *What file types are acceptable?* Vector point files are highly recommended (such as .ai or .eps files). If you don't have access to a vector point file, a large hi-resolution (approximately 150-300 dpi) JPEG, TIFF, BITMAP, GIF or PNG file will work. Having a file with a high dpi will help keep images looking sharp if we need to resize the logo.
- *What file size is recommended?* There is no limitation to the logo file size.

# Modification of Contract (Contract Extension)

(Page 3 of 3)

## Vendor Benefits Description

Currently, we have the following information on our website detailing the benefits of your contract for our members to view:

---

Pueblo Mechanical and Controls, LLC. is a recognized JOC expert, specializing in full spectrum energy efficient heating, cooling, ventilation, and air conditioning [HVAC] installation and service. Since 2001, having completed over 3,800 projects and thousands of service calls for educational institutions, cities, counties, and various federal and private organizations, state-wide. Procuring our services is simple, secure, and above all, cost effective!

Mohave makes utilizing its approved and trustworthy vendors convenient and statute compliant with guidelines and procedures in place that protect you, the customer. Service is friendly and lightning fast! Inquire about our affordable service contracts and enjoy continued technical and hands-on support for systems of all types and ages.

We proudly service a host of governmental agencies with guaranteed work; we will not rest until the project is done right and worthy of the Mohave membership we serve.

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If you wish to revise or update the vendors benefits information we have on file, keep the following requirements in mind:

- The description should be 150-200 words that explain the benefits that your company can provide to our members through your Mohave contract.
- The description should give a brief overview for members who may be accessing information about your contract from our product vendor finder on Mohave's website.
- Please note that Mohave reserves the right to revise or modify the information provided either for content or length.

**Email or fax request for information revisions or additional information to [contracts@mesc.org](mailto:contracts@mesc.org) or 928-718-3232. If you have any questions, contact your Contract Specialist either via email at [michaelc@mesc.org](mailto:michaelc@mesc.org) or phone 928-718-3222.**





# Award Documents

## 19F-PMAC2-0904 Pueblo Mechanical and Controls, LLC

19F-PMAC2-0904 Award Letter.....	2
19F-PMAC2-0904 Offer and Acceptance Form.....	5
19F-0808 Signed Award Recommendation .....	6
19F-0808 Evaluator Agreements .....	23
19F-PMAC2-0904 Federal and State Excluded Parties Documents.....	28

Click section title to be taken directly to that section.

4/5/18 EH



**NOTIFICATION OF AWARD LETTER**

August 30, 2019

**Sent this day via email to [robc@pueblo-mechanical.com](mailto:robc@pueblo-mechanical.com)**

Rob Carr, Contracts Manager  
Pueblo Mechanical and Controls, LLC  
6771 E. Outlook Drive  
Tucson, AZ 85756

Congratulations, Pueblo Mechanical and Controls, LLC's response has been awarded a contract under JOC RFP 19F-0808. Attached is a copy of the Mohave signed *Offer and Acceptance Form*. Important notes and action items regarding the award are listed on the following pages. **Some action items contain important deadlines noted in bold font. Be sure to meet the requests and/or requirements on or before the deadlines noted.**

Your organization is bound by the terms of this contract; **only items specifically requested in this solicitation and awarded in your response to this solicitation will be authorized/allowed. Your award is for Division 23 Heating, Ventilation and Air Conditioning.**

Advise your Mohave customers to make purchase orders out to Pueblo Mechanical and Controls, LLC. In the event you receive a purchase order from a member that does not contain the "MESC REVIEWED" stamp, it should be faxed to (928-718-3232), or emailed ([orders@mesc.org](mailto:orders@mesc.org)) to Mohave for review.

**Do not perform any work or provide any products until you receive an "MESC Reviewed" purchase order.**

We highly recommend having your staff review our vendor information pages at (<http://www.mesc.org/resources-brochures>) to learn more about working with Mohave. Especially helpful is the Vendor Handbook.

The procurement file for JOC RFP 19F-0808 shall be made available for public inspection on September 3, 2019.

Please check all the entries on the contract record attached. You may make additions or revisions to the description (40 words or less), contact persons, contact information, or other information about your contract. Email back any changes as soon as possible to [mike@mesc.org](mailto:mike@mesc.org).

**Your contract number is 19F-PMAC2-0904 and will take effect on September 4, 2019.**

If you have any questions regarding your new contract, please call me at (928) 718-3203. We look forward to working with you and your company in the future.

A handwritten signature in black ink, appearing to read 'Michael Nentwig', with a long horizontal flourish extending to the right.

Michael Nentwig, CPPB  
Contract Specialist I

## NOTES ON AWARD FOR: Pueblo Mechanical and Controls, LLC

- Please remind the member of their responsibility to independently verify that quotations and purchase orders comply with the terms of the award of a contract or procurement. This responsibility is set by rule and statute and cannot be changed by Mohave. Members can go to ([service.mesc.org/PVF/plist.php](http://service.mesc.org/PVF/plist.php)) to assist in meeting this due diligence responsibility.
- Financial information included under Tab 2 of your response will be kept confidential.
- All products must be priced using contract pricing approved by Mohave.
- All quotes shall include your contract #19F-PMAC2-0904.
- **Promotional Pricing (temporary pricing reductions):** Your contract includes terms and conditions that allows your firm to offer temporary pricing reductions. A Promotional Pricing Offer allows you to provide products and services to members at a reduced cost for a limited time basis. Promotional pricing may increase your contract usage and exposure to members. Mohave encourages promotional pricing under the awarded contract to provide additional value to members. Promotional pricing requests are typically reviewed and approved the same day as submitted. Some reminders regarding pricing reductions:
  - Promotional Pricing may be offered at any time during a contract and shall become effective upon notice of acceptance from Mohave.
  - Promotional Pricing (e.g., quantity discounts, time sensitive offers, bundles) must apply to all Mohave orders of similar size and scope.
  - Promotional Pricing limited to a single member are not acceptable.
  - Special time-limited reductions are permissible under the following conditions: 1) reduction is available to all members equally; 2) reduction is for a specific time period, normally not less than thirty (30) days; 3) original price is not exceeded after the time-limit; and 4) Mohave has approved the new prices prior to any offer of the prices to a member.
- Michael Carter, CPPB will be the Contract Specialist assigned to your Mohave contract. Send requests for pricing updates or contractual inquiries to Michael Carter, CPPB - [michael@mesc.org](mailto:michael@mesc.org) after the contract effective date of September 4, 2019. *All future pricing updates must be electronic. Updates on the original Excel workbooks are preferred. Similar formats in Word or PDF are acceptable.*
- Do not provide any goods/services until you receive a Mohave reviewed purchase order.
- Quick payment discounts must be approved by Mohave before being offered to members and must be available equally.
- Order cycle overview:
  1. Member forwards purchase orders to Mohave. Vendor is Pueblo Mechanical and Controls, LLC.
  2. Mohave reviews and emails member order with "MESC Reviewed" stamp, to Pueblo Mechanical and Controls, LLC.
  3. Pueblo Mechanical and Controls, LLC provides product/services.
  4. Pueblo Mechanical and Controls, LLC invoices member.
  5. Member pays Pueblo Mechanical and Controls, LLC.
  6. Pueblo Mechanical and Controls, LLC sends Usage and Reconciliation Report to Mohave.
  7. Pueblo Mechanical and Controls, LLC remits administration fee monthly, based on invoices paid.
  8. Mohave audits selected purchases.
- Upon award of your contract, you may request to use estimating software other than *RS Means Costworks*. The estimating software shall use *RS Means pricing data* and meet all of the requirements for pricing under this IFB. Estimating samples shall be provided to Mohave for review prior to Mohave's acceptance of estimating software to be used under an awarded contract. Mohave shall make the final determination if estimating software meets all the requirements and is acceptable. Contract vendor agrees that if proposed alternate estimating software does not continue to meet the requirements of the RFP/IFB, contract vendor shall immediately switch to *RS Means Costworks* as the estimating software under an awarded contract.

### REQUIREMENTS/ACTION ITEMS FOR THE AWARD:

## NOTES ON AWARD FOR: Pueblo Mechanical and Controls, LLC

- You agreed to provide a Reconciliation Report detailing activity under the contract, and payment for Mohave administration fees for invoices paid in the previous month. Your report is due on the 20th of each month. **Mohave's Audit Specialist will contact you and provide you with a sample report, based on reports provided under contract 14G-PMAC2-0904.**
- If no invoices were paid under the contract in the previous month, you may send an email to [adminreport@mesc.org](mailto:adminreport@mesc.org) advising of no sales to report for the month.
- Because you have an existing Mohave contract, we want to address how to properly report invoices on your monthly reconciliation reports because it may be necessary to submit two separate reports until all old contract purchases are closed:
  - Line item purchase orders that remain open under 14G-PMAC2-0904 should be reported on 14G-PMAC2-0904 reconciliation reports.
  - Blanket purchase order invoices with a ship date prior to, or on September 3, 2019 should be reported on the 14G-PMAC2-0904 reconciliation report.
  - New purchase orders issued under the 19F-PMAC2-0904 contract should be reported under 19F-PMAC2-0904 reconciliation reports.
  - Blanket purchase order invoices with a ship date after September 3, 2019 should be reported on the 19F-PMAC2-0904 reconciliation reports.
- Administration fee payments should be mailed to:

Mohave Educational Services  
625 E. Beale St.  
Kingman, AZ 86401
- In order to assist members with new contract award notices, Mohave will be releasing your contract award information to the members prior to September 4, 2019. Information regarding your contract award will be posted to our website and will be made available in our product vendor finder. Pricing from your awarded contract will also be made available to our members. All of this information will be accessible by our members before September 4, 2019. You may provide quotes to members for this contract. However, it will be your responsibility to inform members the contract is not effective until September 4, 2019, and members should not be processing purchase orders until that date. Acting on purchase orders (delivering products or services) prior to September 4, 2019 **is a violation of the contract.** Please ensure that your staff is aware of the effective date September 4, 2019, in order to avoid contract confusion.
- We feature marketing information about your current contract in the product vendor finder on our website. Please visit our website ([www.mesc.org](http://www.mesc.org)) and go to the "All Products/Vendors" under the "Contracts & Solicitations" menu. Find your company from the list and click on your name. Once on your company information, review the "About Vendor" section of the "Overview." Confirm in writing if that information is still accurate, or if changes need to be made. Mohave reserves the right to edit information for content or length. **Email this information to [mike@mesc.org](mailto:mike@mesc.org) no later than September 20, 2019.**

**Technical Proposal – Offer and Acceptance Form**  
**(Place after Tab 1a)**

**RFP 19F-0808**

**Job Order Contracting for Various Construction Trades**

**To Mohave Educational Services Cooperative, Inc.:**

The undersigned hereby certifies understanding and compliance with the requirements in all terms, conditions, specifications and amendments. Offeror further agrees to furnish materials and/or services in compliance with all terms, conditions, specifications and amendments in the solicitation and any written exceptions in the offer.

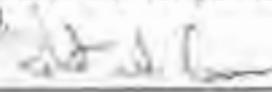
Federal Employer Identification Number 86-1027390

Company Name Pueblo Mechanical & Controls, LLC

Address 6771 E Outlook Drive City Tucson State AZ Zip 85756

Telephone Number 800.840.9170

The *Offer and Acceptance Form* should be submitted with a signature of the person authorized to sign the proposal. The person signing the proposal shall initial erasures, interlineations, or other modifications in proposal. Failure to sign the *Offer and Acceptance Form*, or to make other notations as indicated, may result in rejection of proposal.

**Authorized Signature** 

Printed Name Rob Carr Title Contracts Manager

Primary Email robcc@pueblo-mechanical.com Alternate email N/A

*Note: The primary email address will be used for all communication from Mohave regarding your response to this solicitation. Provide an alternate email address that will be used **only** if the primary email address is not valid.*

**The contract vendor shall not commence any billable work or provide any material or service under this contract unless and until contract vendor receives a purchase order with Mohave's review noted.**

**Acceptance of Offer and Contract Award (Mohave Only)**

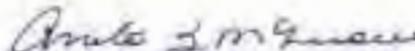
***Your Proposal is Hereby Accepted:***

As an awarded contract vendor, you are now bound to sell the materials and/or services offered to and accepted by Mohave in accordance with the solicitation, including all terms, conditions, specifications, amendments and any accepted written exceptions.

This contract shall be referred to as Contract Number 19F-PMAC2-0904

Awarded this 30 day of August 2019.

This contract shall be effective the 4 day of September 2019.



Anita S. McLemore, C.P.M., Executive Director  
Mohave Educational Services Cooperative, Inc.



**Date: 8/30/19**

**To: Anita S. McLemore, C.P.M., Executive Director**

**Through: Nancy Colbaugh, CPPB, Contracts Manager**

**From: Michael Nentwig, CPPB, Contract Specialist I**

**Subject: Award Recommendation for JOC RFP 19F-0808, Job Order Contracting for Various Construction Trades**

On August 8, 2019 Mohave received thirteen responses to JOC RFP 19F-0808. Twelve were determined to be acceptable for further consideration after the evaluation of technical proposals. One response did not provide all the required information and was consider non-responsive.

The offers were evaluated using the criteria set forth in the solicitation. The following is a summary of the final scores utilizing the Heisman method of ranking:

<b>General Contracting Divisions 1 – 49 Heisman Ranking</b>	<b>Mike Nentwig</b>	<b>Michael Carter</b>	<b>Nancy Colbaugh</b>	<b>Jeff Bohnenkamp</b>	<b>Phil Allred</b>	<b>Average Rank</b>
<b>GCON, Inc.</b>	2	1	1	1	1	<b>1.20</b>
<b>SD Crane Builders, Inc.</b>	1	2	3	3	2	<b>2.20</b>
<b>SDB, Inc.</b>	3	4	2	2	3	<b>2.80</b>
<b>Caliente Construction, Inc.</b>	4	3	4	5	5	<b>4.20</b>
<b>McCarthy Building Companies, Inc.</b>	5	5	5	4	4	<b>4.60</b>

Details for the recommended awards are as follows for Divisions 1-49 General Contracting:

- GCON, Inc. was the number one ranking offer for Division 1- 49 General Contracting services. They offered a full service general contracting management of all projects. They oversee the entire construction process with their in-house staff and with the use of qualified subcontractors. UPB, and Open Book pricing methodologies were offered along with maintenance services and extended warranties. GCON, Inc. has an aggregate bonding capacity of \$90 Million and holds a current B-1 Arizona Registrar of Contractors license.
- SD Crane Builders, Inc. was the number two ranking offer for Division 1 – 49 General Contracting services. They offered general contracting and construction services, including new buildings, renovations, remodels and building improvements. UPB, and Open Book pricing methodologies were offered along with design and engineering services. SD Crane Builders, Inc. has an aggregate bonding capacity of \$25 Million and holds a current B-1 Arizona Registrar of Contractors license.
- SBD, Inc. was the number three ranking offer for Division 1 – 49 General Contracting services. They offered complete construction and construction management services. Pre-construction services include cost estimating, site investigation, LEED analysis, constructability and value engineering. UPB, and Open Book pricing methodologies were offered along with design and engineering services. SDB, Inc. has an aggregate bonding capacity of \$50 Million and holds a current A and B-1 Arizona Registrar of Contractors license.

## JOC RFP 19F-0808 Award Recommendation

- Caliente Construction, Inc. was the number four ranking offer for Division 1 – 49 General Contracting services. They offered complete contract management services that include existing conditions analysis, scope definition, procurement planning, project schedule development and management. UPB, and Open Book pricing methodologies were offered. In-house design and engineering services were not offered but can be provided through the use of a qualified subcontractor. Caliente Construction, Inc. has an aggregate bonding capacity of \$75 Million and holds a current A, B and B-1 Arizona Registrar of Contractors license.
- McCarthy Building Companies, Inc. was the number five ranking offer for Division 1 – 49 General Contracting services. They offered construction and contraction management services. They have a local staff of over 796 craft workers and offered the following self-performed services to include solar, mechanical, electrical, concrete, plumbing, civil engineering and carpentry. UPB, and Open Book pricing methodologies were offered. In-house design and engineering services were not offered but can be provided through the use of a qualified subcontractor. McCarthy Building Companies, Inc. has an aggregate bonding capacity of \$6 Billion and holds a current A, B, and B-1 Arizona Registrar of Contractors license.

<b>Plumbing Division 22 Heisman Ranking</b>	<b>Mike Nentwig</b>	<b>Michael Carter</b>	<b>Nancy Colbaugh</b>	<b>Jeff Bohnenkamp</b>	<b>Phil Allred</b>	<b>Average Rank</b>
<b>Midstate Mechanical, Inc.</b>	1	1	1	1	1	<b>1.00</b>
<b>Sun Mechanical Contracting, Inc.</b>	2	2	2	2	2	<b>2.00</b>
<b>McCarthy Building Companies, Inc.</b>	3	3	3	3	3	<b>3.00</b>
<b>Uni-Tech Mechanical</b>	4	4	4	4	4	<b>4.00</b>

Details for the recommended awards are as follows for Division 22 Plumbing:

- Midstate Mechanical, Inc. was the number one ranking offer for Division 22 Plumbing job order contracting services. They provide complete turnkey plumbing projects from their offices in Phoenix and Tucson and field offices in Flagstaff and Yuma. As a value add, they provide 3-D modeling of projects allowing for the offsite prefabrication of plumbing systems. This reduces the impact to building operations and maximizing onsite work. System commissioning, preventive maintenance, and repair services were offered. Midstate Mechanical, Inc. has an aggregate bonding capacity of \$40 Million and holds a current B-1 and CR-37 Arizona Registrar of Contractors license.
- Sun Mechanical Contracting, Inc. was the number two ranking offer for Division 22 Plumbing job order contracting services. Value added services include the use of 3-D modeling and CAD to increase productivity. Members will have complete online access to all repair/service reports, work order history, and equipment logs. System commissioning, preventive maintenance, and repair services were offered. Sun Mechanical Contracting, Inc. has an aggregate bonding capacity of \$125 Million and holds a current B-1 and CR-37 Arizona Registrar of Contractors license.
- McCarthy Building Companies, Inc. was the number three ranking offer for Division 22 Plumbing job order contracting services. They provide complete plumbing projects, by conducting a “Pre-project Planning and Performance” meeting to identify goals, develop the schedule to meet the quality requirements and customer expectations. McCarthy Building Companies, Inc. is a national company that employ 796 local craft workers and can leverage additional support from four regional offices within a half a day of travel. McCarthy Building Companies, Inc. has an aggregate bonding capacity of \$6 Billion and holds a current A, B, B-1 and CR-37 Arizona Registrar of Contractors license.

## JOC RFP 19F-0808 Award Recommendation

Heating, Ventilation and Air Conditioning Division 23 Heisman Ranking	Mike Nentwig	Michael Carter	Nancy Colbaugh	Jeff Bohnenkamp	Phil Allred	Average Rank
<b>Midstate Mechanical, Inc.</b>	1	1	1	1	1	<b>1.00</b>
<b>Sun Mechanical Contracting, Inc.</b>	2	2	2	2	3	<b>2.20</b>
<b>McCarthy Building Companies, Inc.</b>	4	5	3	3	2	<b>3.40</b>
<b>Pueblo Mechanical and Controls, Inc.</b>	5	3	4	4	4	<b>4.00</b>
<b>HACI, Inc.</b>	3	4	5	5	5	<b>4.40</b>

Details for the recommended awards are as follows for Division 23 Heating, Ventilation and Air Conditioning:

- Midstate Mechanical, Inc. was the number one ranking offer for Division 23 Heating, Ventilation and Air Conditioning job order contracting services. They can provide complete turnkey mechanical projects from their offices in Phoenix and Tucson and field offices in Flagstaff and Yuma. As a value add, they can provide 3-D modeling of projects allowing for the offsite prefabrication of HVAC systems. This reduces the impact to building operations and maximizing onsite work. System commissioning, preventive maintenance, and repair services were offered. Midstate Mechanical, Inc. has an aggregate bonding capacity of \$40 Million and holds a current B-1 and CR-39 Arizona Registrar of Contractors license.
- Sun Mechanical Contracting, Inc. was the number two ranking offer for Division 23 Heating, Ventilation and Air Conditioning job order contracting services. Value added services include the use of 3-D modeling and CAD to increase productivity. Members will have complete online access to all repair/service reports, work order history, and equipment logs. System commissioning, preventive maintenance, and repair services were offered. Sun Mechanical Contracting, Inc. has an aggregate bonding capacity of \$125 Million and holds a current B-1 and CR-39 Arizona Registrar of Contractors license.
- McCarthy Building Companies, Inc. was the number three ranking offer for Division 23 Heating, Ventilation and Air Conditioning job order contracting services. They provide complete mechanical projects, by conducting a "Pre-project Planning and Performance" meeting to identify goals, develop the schedule to meet the quality requirements and customer expectations. McCarthy Building Companies, Inc. is a national company that employ 796 local craft workers and can leverage additional support from four regional offices within a half a day of travel. McCarthy Building Companies, Inc. has an aggregate bonding capacity of \$6 Billion and holds a current A, B, B-1 and CR-39 Arizona Registrar of Contractors license.
- Pueblo Mechanical and Controls, Inc. was the number four ranking offer for Division 23 Heating, Ventilation and Air Conditioning job order contracting services. They can provide complete heating, ventilation and air conditioning projects from their offices in Phoenix and Tucson. This allows for quick response to customer emergencies. Pueblo Mechanical and Controls, Inc. can competitively access virtually all makes and models of equipment. System commissioning, preventive maintenance, and repair services were offered. Pueblo Mechanical Contracting, Inc. has an aggregate bonding capacity of \$45 Million and holds a current B-1 and CR-39 Arizona Registrar of Contractors license.
- HACI, Inc. was the fifth ranking offer for Division 23 Heating, Ventilation and Air Conditioning job order contracting services. They offered the ability to develop the most cost-effective HVAC systems through use of the design build / design assist process. They have fully automated fabrication facility and ample storage capabilities to provide "on-time" material deliveries. Repair services and maintenance service agreements were also offered. HACI, Inc. has an aggregate bonding capacity of \$80 Million and holds a current B-1 and CR-39 Arizona Registrar of Contractors license.

## JOC RFP 19F-0808 Award Recommendation

Electrical Division 26 Heisman Ranking	Mike Nentwig	Michael Carter	Nancy Colbaugh	Jeff Bohnenkamp	Phil Allred	Average Rank
Rosendin Electric	1	1	1	1	1	1.00

Details for the recommended awards are as follows for Divisions 26 Electrical:

- Rosendin Electric was the number one ranking offer for Division 26 Electrical job order contracting services. They provided complete services for electrical projects including an engineering department with Arizona registered professional engineers. As a value add, Rosendin Electric capabilities include Building Information Modeling (BIM) that can electronically model a building to identify potential interferences between a building's utility and structural elements. Rosendin Electric has an aggregate bonding capacity of \$1.35 Billion and holds a current A, B-1, and C-11 Arizona Registrar of Contractors license.

The evaluation committee determined a single award is not advantageous to Mohave's members. The solicitation authorized multiple awards to meet the needs of Mohave's large number of various types of members located throughout Arizona. This is a statewide contract aimed at providing sources for job order contracting construction services for general contracting, plumbing, heating, ventilation and air conditioning and electrical. No single offer demonstrated the ability to effectively, and efficiently meet all our members' needs for new construction, renovation, remodel, remediation, installation of new equipment or systems, replacement, repair or equipment maintenance services.

Award is recommended to the least number of offerors determined necessary to meet the members' requirements. The decision was based upon considerations for the large number of members, diverse types of members, location of members throughout Arizona and members' past usage of similar contracts.

The criteria for selecting offerors for multiple contracts shall be based upon considerations for members' experience with existing general contracting, plumbing, heating, ventilation and air conditioning, and electrical services that include construction, renovation, design, emergency services, brand continuity for system replacement and future expansion. Awarded contract vendor's ability to provide for our large, diverse membership, geographic area(s) served, Mohave's past experience with contracts for similar product/services, and/or other relevant criteria.

None of the offerors recommended for award are on the United States General Services Administration's Excluded Parties List, or on the Arizona Department of Administration Excluded Parties List.

The current contracts under JOC RFP 14G-0808 expire on September 3, 2019. It is recommended the awards under JOC RFP 19F-0808 take effect on September 4, 2019.

It is the recommendation of the evaluation committee that contracts be awarded to Caliente Construction, Inc., GCON, Inc., HACI, Inc., McCarthy Building Companies, Inc., Midstate Mechanical, Inc., Pueblo Mechanical and Controls LLC., Rosendin Electric, SD Crane Builders, Inc., SDB, Inc., and Sun Mechanical Contracting, Inc. for Job Order Contracting for Various Trades.

### **Not acceptable for further consideration after initial evaluation**

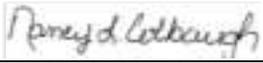
**BWC Enterprises Inc. dba Woodruff Construction** - The bonding capacity letter required by *Special Term and Condition 1.2. Bonding Capacity* was not included in the offer.

### **Not recommended for award**

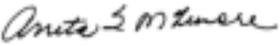
**United Technologies Inc. dba UNI-TECH** - The proposal received a lower score and a substantially higher coefficient than the three statewide offers recommended for award. The Division 22 Plumbing services included in the offer are provided by the higher scoring offerors recommended for award. There were no apparent price or additional services offered to substantiate award of this lower scoring proposal.

**JOC RFP 19F-0808 Award Recommendation**

Approval of the #19F-0808 award as recommended:

Signature:   
Nancy Colbaugh, CPPB  
Contracts Manager

Date: August 30, 2019

Signature:   
Anita S. McLemore, C.P.M.  
Executive Director

Date: August 30, 2019

DISCLAIMER

The data supplied below is based on your specific request(s) and is correct to the best of our knowledge as of the date and time it was extracted from our data files. The information is provided without personal research or analysis. The data is subject to change on a daily basis. You may obtain additional public records related to any licensee, including dismissed complaints and nondisciplinary actions and orders, by contacting the ROC directly. If this information is required for legal purposes, you may request an affidavit or certified copies for a fee as specified in [A.R.S. 32-1104A3 \(https://www.azleg.gov/viewdocument/?docName=http://www.azleg.gov/ars/32/01104.htm\)](https://www.azleg.gov/viewdocument/?docName=http://www.azleg.gov/ars/32/01104.htm). Please read our Standard Terms of Use at [roc.az.gov/terms \(/terms\)](http://roc.az.gov/terms).

Please note: The company or individuals listed on this license may hold other Arizona contracting licenses. To view information, status and complaint history for the past two years on other licenses held, go to the License Inquiry page and do a "Company Name and Personnel" search by entering the name of the company or individuals listed on the license.

# DETAILS FOR PUEBLO MECHANICAL AND CONTROLS LLC LICENSE NUMBER ROC 173953

THURSDAY AUGUST 29, 2019 03:08:42 PM

## CONTRACTOR

## LICENSE

NAME / ADDRESS / PHONE

CLASS & DESCRIPTION

### Pueblo Mechanical and Controls LLC

### General Commercial B-1 General Commercial Contractor

6771 E Outlook Dr  
Tucson, AZ 85756-9409  
Phone: (520) 545-1044

ENTITY TYPE

STATUS / ACTION

LLC

Active

ISSUED / RENEWAL

First Issued: 2002-03-28  
Renewed Through: 2020-03-31

## QUALIFYING PARTY & PERSONNEL

The Qualifying Party listed below is associated with this license. All other persons named, if any, are associated with the company. They are not all necessarily associated with this license.

**Name:** Steven Joseph Barry

**Name:** Susanne Andrews

**Name:** Daniel Theodore Bueschel

**Position:** Qualifying Party

**Position:** Other

**Position:** Manager

**Other Positions:** EMPLOYEE

**Other Positions:** Executive

**Other Licenses:**

**Other Licenses:**

Administrative Assistant

[176640 \(/contractor-search?](#)

[176640 \(/contractor-search?Id=a0Yt000000ACZHeEAP\)](#)

[176640 \(/contractor-search?](#)

[Id=a0Yt000000ACZHeEAP\)](#)

(Pueblo Mechanical and Controls LLC)

(Pueblo Mechanical and Controls LLC)

(Pueblo Mechanical and Controls LLC)

[260462 \(/contractor-search?](#)

[260462 \(/contractor-search?](#)

[260462 \(/contractor-search?](#)

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[Id=a0Yt000000ACNAwEAP\)](#)

(Pueblo Mechanical and Controls LLC)

(Pueblo Mechanical and Controls LLC)

(Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search?](#)

[323201 \(/contractor-search?](#)

[323201 \(/contractor-search?](#)

[Id=a0Yt000000B65LPEAZ\)](#) (Pueblo

[Id=a0Yt000000B65LPEAZ\)](#) (Pueblo

Mechanical and Controls LLC)

Mechanical and Controls LLC)  
[324363 \(/contractor-search?Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** Danielle Marie Lalli

**Position:** Member

**Other Licenses:**

[176640 \(/contractor-search?Id=a0Yt000000ACZHeEAP\)](#)  
(Pueblo Mechanical and Controls LLC)

[260462 \(/contractor-search?Id=a0Yt000000ACNAwEAP\)](#)  
(Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search?Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[324363 \(/contractor-search?Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** Arlene Adair Bleakney

**Position:** FORMER Officer

**Disassociation Date: 2019-01-08**

**Name:** Huron Capital Partners LLC

**Position:** Related Entity, Parent Entity

[Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)  
[324363 \(/contractor-search?Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** Pamelyn Weatherly Tolkoff

**Position:** Chief Financial Officer

**Other Licenses:**

[176640 \(/contractor-search?Id=a0Yt000000ACZHeEAP\)](#)  
(Pueblo Mechanical and Controls LLC)

[260462 \(/contractor-search?Id=a0Yt000000ACNAwEAP\)](#)  
(Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search?Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[324363 \(/contractor-search?Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** Robert Dennis DiFusco

**Position:** FORMER Vice President

**Other Positions:** Historical Officer

**Other Licenses:**

[077052 \(/contractor-search?Id=a0Yt000000ACW0FEAX\)](#)  
(Pueblo Heating and Cooling Inc)

[079382 \(/contractor-search?Id=a0Yt000000ACauoEAD\)](#) (Pueblo Heating and Cooling Inc)

[275879 \(/contractor-search?Id=a0Yt000000ACHkUEAX\)](#)  
(Robert's Heating & Cooling LLC)

[275880 \(/contractor-search?Id=a0Yt000000ACMF7EAP\)](#)  
(Robert's Heating & Cooling LLC)

**Disassociation Date: 2019-01-08**

**Name:** Pueblo Holdings LLC

**Position:** Related Entity, Parent Entity

[324363 \(/contractor-search?Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** John Paul Beckham

**Position:** FORMER Treasurer

**Other Positions:** Historical Officer

**Other Licenses:**

[171635 \(/contractor-search?Id=a0Yt000000ACIEmEAP\)](#)  
(Positive Plus Systems Inc)

**Disassociation Date: 2019-01-08**

**Name:** Craig Kenneth Lostutter

**Position:** FORMER Secretary

**Other Positions:** Historical Officer

**Other Licenses:**

[171635 \(/contractor-search?Id=a0Yt000000ACIEmEAP\)](#)  
(Positive Plus Systems Inc)

[253141 \(/contractor-search?Id=a0Yt000000ACZ8XEAX\)](#)  
(Beckham's Electric LLC)

**Disassociation Date: 2019-01-08**

# COMPLAINT INFORMATION

Complaints against this contractor are listed below. Complaints that were cancelled, resolved or settled without a corrective work order or dismissed are not included. Contact the **Registrar of Contractors at 602-542-1525 or toll-free statewide at 1-877-My AZROC (1-877-692-9762)** to identify the ROC office location you need to visit to view complete complaint documentation.

<b>0</b> Open Cases <small>i</small>	<b>CLOSED CASES</b>	
	<b>0</b> Disciplined Cases <small>i</small>	<b>0</b> Resolved / Settled Cases <small>i</small>

# BOND INFORMATION

**How to collect from a license bond** (<https://roc.az.gov/recovery-fund?targetclass=answer-question-collect#question-collect>)

Bond Type: **SURETY**

Bond Number: **59BSBAJ5579**

Effective Date: **2010-03-29**

Bond Company: **HARTFORD ACCIDENT AND INDEMNITY COMPANY**

Amount: **\$ 0.00**

Paid: **\$ 0.00**

Available: **\$ 50000.00**

Status: **ACTIVE**

DISCLAIMER

The data supplied below is based on your specific request(s) and is correct to the best of our knowledge as of the date and time it was extracted from our data files. The information is provided without personal research or analysis. The data is subject to change on a daily basis. You may obtain additional public records related to any licensee, including dismissed complaints and nondisciplinary actions and orders, by contacting the ROC directly. If this information is required for legal purposes, you may request an affidavit or certified copies for a fee as specified in A.R.S. 32-1104A3 (<https://www.azleg.gov/viewdocument/?docName=http://www.azleg.gov/ars/32/01104.htm>). Please read our Standard Terms of Use at [roc.az.gov/terms](http://roc.az.gov/terms) (/terms).

Please note: The company or individuals listed on this license may hold other Arizona contracting licenses. To view information, status and complaint history for the past two years on other licenses held, go to the License Inquiry page and do a "Company Name and Personnel" search by entering the name of the company or individuals listed on the license.

# DETAILS FOR PUEBLO MECHANICAL AND CONTROLS LLC LICENSE NUMBER ROC 176640

THURSDAY AUGUST 29, 2019 03:08:56 PM

## CONTRACTOR

## LICENSE

NAME / ADDRESS / PHONE

CLASS & DESCRIPTION

### Pueblo Mechanical and Controls LLC

### Specialty Dual CR-39 Air Conditioning and Refrigeration

6771 E Outlook Dr  
Tucson, AZ 85756-9409  
Phone: (520) 545-1044

ENTITY TYPE

STATUS / ACTION

LLC

Active

ISSUED / RENEWAL

First Issued: 2002-07-01  
Renewed Through: 2020-07-31

## QUALIFYING PARTY & PERSONNEL

The Qualifying Party listed below is associated with this license. All other persons named, if any, are associated with the company. They are not all necessarily associated with this license.

**Name:** Steven Joseph Barry

**Name:** Susanne Andrews

**Name:** Daniel Theodore Bueschel

**Position:** Qualifying Party

**Position:** Other

**Position:** Manager

**Other Positions:** EMPLOYEE

**Other Positions:** Executive

**Other Licenses:**

**Other Licenses:**

Administrative Assistant

[173953 \(/contractor-search?](#)

[Id=a0Yt000000ACRJsEAP\)](#) (Pueblo Mechanical and Controls LLC)

**Other Licenses:**

[173953 \(/contractor-search?](#)  
[Id=a0Yt000000ACRJsEAP\)](#) (Pueblo Mechanical and Controls LLC)

[260462 \(/contractor-search?](#)

[173953 \(/contractor-search?](#)  
[Id=a0Yt000000ACRJsEAP\)](#) (Pueblo Mechanical and Controls LLC)

[260462 \(/contractor-search?](#)

[Id=a0Yt000000ACNAwEAP\)](#)

[260462 \(/contractor-search?](#)

[Id=a0Yt000000ACNAwEAP\)](#)

(Pueblo Mechanical and Controls LLC)

[Id=a0Yt000000ACNAwEAP\)](#)  
(Pueblo Mechanical and Controls LLC)

(Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search?](#)

[323201 \(/contractor-search?](#)

[323201 \(/contractor-search?](#)

[Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search?](#)  
[Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[324363 \(/contractor-search?](#)

[324363 \(/contractor-search? Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** Danielle Marie Lalli

**Position:** Member

**Other Licenses:**

[173953 \(/contractor-search? Id=a0Yt000000ACRJsEAP\)](#) (Pueblo Mechanical and Controls LLC)

[260462 \(/contractor-search? Id=a0Yt000000ACNAwEAP\)](#)  
(Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search? Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[324363 \(/contractor-search? Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** Arlene Adair Bleakney

**Position:** FORMER Officer

**Disassociation Date: 2019-01-08**

Mechanical and Controls LLC)  
[324363 \(/contractor-search? Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** Pamelyn Weatherly Tolkoff

**Position:** Chief Financial Officer

**Other Licenses:**

[173953 \(/contractor-search? Id=a0Yt000000ACRJsEAP\)](#) (Pueblo Mechanical and Controls LLC)

[260462 \(/contractor-search? Id=a0Yt000000ACNAwEAP\)](#)  
(Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search? Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[324363 \(/contractor-search? Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** Robert Dennis DiFusco

**Position:** FORMER Vice President

**Other Positions:** Historical Officer

**Other Licenses:**

[077052 \(/contractor-search? Id=a0Yt000000ACW0FEAX\)](#)  
(Pueblo Heating and Cooling Inc)

[079382 \(/contractor-search? Id=a0Yt000000ACauoEAD\)](#) (Pueblo Heating and Cooling Inc)

[275879 \(/contractor-search? Id=a0Yt000000ACHkUEAX\)](#)  
(Robert's Heating & Cooling LLC)

[275880 \(/contractor-search? Id=a0Yt000000ACMF7EAP\)](#)  
(Robert's Heating & Cooling LLC)

**Disassociation Date: 2019-01-08**

**Name:** Huron Capital Partners LLC

**Position:** Related Entity, Parent Entity

**Name:** Pueblo Holdings LLC

**Position:** Related Entity, Parent Entity

[Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** John Paul Beckham

**Position:** FORMER Treasurer

**Other Positions:** Historical Officer

**Other Licenses:**

[171635 \(/contractor-search? Id=a0Yt000000ACIEmEAP\)](#)  
(Positive Plus Systems Inc)

**Disassociation Date: 2019-01-08**

**Name:** Craig Kenneth Lostutter

**Position:** FORMER Secretary

**Other Positions:** Historical Officer

**Other Licenses:**

[171635 \(/contractor-search? Id=a0Yt000000ACIEmEAP\)](#)  
(Positive Plus Systems Inc)

[253141 \(/contractor-search? Id=a0Yt000000ACZ8XEAX\)](#)  
(Beckham's Electric LLC)

**Disassociation Date: 2019-01-08**

## COMPLAINT INFORMATION

Complaints against this contractor are listed below. Complaints that were cancelled, resolved or settled without a corrective work order or dismissed are not included. Contact the **Registrar of Contractors at 602-542-1525 or toll-free statewide at 1-877-My AZROC (1-877-692-9762)** to identify the ROC office location you need to visit to view complete complaint documentation.

<b>0</b> Open Cases <small>i</small>	<b>CLOSED CASES</b>	
	<b>0</b> Disciplined Cases <small>i</small>	<b>0</b> Resolved / Settled Cases <small>i</small>

## BOND INFORMATION

**How to collect from a license bond** (<https://roc.az.gov/recovery-fund?targetclass=answer-question-collect#question-collect>)

Bond Type: **SURETY**

Bond Number: **59BSBAJ5581**

Effective Date: **2014-07-07**

Bond Company: **HARTFORD FIRE INSURANCE COMPANY**

Amount: **\$ 0.00**

Paid: **\$ 0.00**

Available: **\$ 54250.00**

Status: **ACTIVE**

DISCLAIMER

The data supplied below is based on your specific request(s) and is correct to the best of our knowledge as of the date and time it was extracted from our data files. The information is provided without personal research or analysis. The data is subject to change on a daily basis. You may obtain additional public records related to any licensee, including dismissed complaints and nondisciplinary actions and orders, by contacting the ROC directly. If this information is required for legal purposes, you may request an affidavit or certified copies for a fee as specified in [A.R.S. 32-1104A3 \(https://www.azleg.gov/viewdocument/?docName=http://www.azleg.gov/ars/32/01104.htm\)](https://www.azleg.gov/viewdocument/?docName=http://www.azleg.gov/ars/32/01104.htm). Please read our Standard Terms of Use at [roc.az.gov/terms \(/terms\)](http://roc.az.gov/terms).

Please note: The company or individuals listed on this license may hold other Arizona contracting licenses. To view information, status and complaint history for the past two years on other licenses held, go to the License Inquiry page and do a "Company Name and Personnel" search by entering the name of the company or individuals listed on the license.

# DETAILS FOR PUEBLO MECHANICAL AND CONTROLS LLC LICENSE NUMBER ROC 260462

THURSDAY AUGUST 29, 2019 03:08:05 PM

## CONTRACTOR

## LICENSE

NAME / ADDRESS / PHONE

CLASS & DESCRIPTION

### Pueblo Mechanical and Controls LLC

### Specialty Dual CR-74 Boilers, Steamfitting & Process Piping, Including Solar

6771 E Outlook Dr  
Tucson, AZ 85756-9409  
Phone: (520) 545-1044

ENTITY TYPE

STATUS / ACTION

LLC

Active

ISSUED / RENEWAL

First Issued: 2009-12-01  
Renewed Through: 2019-12-31

## QUALIFYING PARTY & PERSONNEL

The Qualifying Party listed below is associated with this license. All other persons named, if any, are associated with the company. They are not all necessarily associated with this license.

**Name:** Steven Joseph Barry

**Name:** Susanne Andrews

**Name:** Daniel Theodore Bueschel

**Position:** Qualifying Party

**Position:** Other

**Position:** Manager

**Other Positions:** EMPLOYEE

**Other Positions:** Executive

**Other Licenses:**

[173953 \(/contractor-search?Id=a0Yt000000ACRJsEAP\)](#) (Pueblo Mechanical and Controls LLC)

**Other Licenses:**

[173953 \(/contractor-search?Id=a0Yt000000ACRJsEAP\)](#) (Pueblo Mechanical and Controls LLC)

[176640 \(/contractor-search?Id=a0Yt000000ACZHeEAP\)](#) (Pueblo Mechanical and Controls LLC)

[173953 \(/contractor-search?Id=a0Yt000000ACRJsEAP\)](#) (Pueblo Mechanical and Controls LLC)

[176640 \(/contractor-search?Id=a0Yt000000ACZHeEAP\)](#) (Pueblo Mechanical and Controls LLC)

[176640 \(/contractor-search?Id=a0Yt000000ACZHeEAP\)](#) (Pueblo Mechanical and Controls LLC)

[176640 \(/contractor-search?Id=a0Yt000000ACZHeEAP\)](#) (Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search?Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search?Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search?Id=a0Yt000000ACZHeEAP\)](#) (Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search?Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[324363 \(/contractor-search?Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search?Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[324363 \(/contractor-search?Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[324363 \(/contractor-search? Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** Danielle Marie Lalli

**Position:** Member

**Other Licenses:**

[173953 \(/contractor-search? Id=a0Yt000000ACRJsEAP\)](#) (Pueblo Mechanical and Controls LLC)

[176640 \(/contractor-search? Id=a0Yt000000ACZHeEAP\)](#)  
(Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search? Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[324363 \(/contractor-search? Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** Arlene Adair Bleakney

**Position:** FORMER Officer

**Disassociation Date: 2019-01-08**

Mechanical and Controls LLC)  
[324363 \(/contractor-search? Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** Pamelyn Weatherly Tolkoff

**Position:** Chief Financial Officer

**Other Licenses:**

[173953 \(/contractor-search? Id=a0Yt000000ACRJsEAP\)](#) (Pueblo Mechanical and Controls LLC)

[176640 \(/contractor-search? Id=a0Yt000000ACZHeEAP\)](#)  
(Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search? Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

[324363 \(/contractor-search? Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** Robert Dennis DiFusco

**Position:** FORMER Vice President

**Other Positions:** Historical Officer

**Other Licenses:**

[077052 \(/contractor-search? Id=a0Yt000000ACW0FEAX\)](#)  
(Pueblo Heating and Cooling Inc)

[079382 \(/contractor-search? Id=a0Yt000000ACauoEAD\)](#) (Pueblo Heating and Cooling Inc)

[275879 \(/contractor-search? Id=a0Yt000000ACHkUEAX\)](#)  
(Robert's Heating & Cooling LLC)

[275880 \(/contractor-search? Id=a0Yt000000ACMF7EAP\)](#)  
(Robert's Heating & Cooling LLC)

**Disassociation Date: 2019-01-08**

**Name:** Huron Capital Partners LLC

**Position:** Related Entity, Parent Entity

**Name:** Pueblo Holdings LLC

**Position:** Related Entity, Parent Entity

[Id=a0Yt00000081HCnEAM\)](#)  
(Pueblo Mechanical and Controls LLC)

**Name:** John Paul Beckham

**Position:** FORMER Treasurer

**Other Positions:** Historical Officer

**Other Licenses:**

[171635 \(/contractor-search? Id=a0Yt000000ACIEmEAP\)](#)  
(Positive Plus Systems Inc)

**Disassociation Date: 2019-01-08**

**Name:** Craig Kenneth Lostutter

**Position:** FORMER Secretary

**Other Positions:** Historical Officer

**Other Licenses:**

[171635 \(/contractor-search? Id=a0Yt000000ACIEmEAP\)](#)  
(Positive Plus Systems Inc)

[253141 \(/contractor-search? Id=a0Yt000000ACZ8XEAX\)](#)  
(Beckham's Electric LLC)

**Disassociation Date: 2019-01-08**

## COMPLAINT INFORMATION

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	<b>0</b> Disciplined Cases <small>i</small>	<b>0</b> Resolved / Settled Cases <small>i</small>

## BOND INFORMATION

**How to collect from a license bond** (<https://roc.az.gov/recovery-fund?targetclass=answer-question-collect#question-collect>)

Bond Type: **SURETY**

Bond Number: **59BSBAJ5578**

Effective Date: **2009-12-01**

Bond Company: **HARTFORD FIRE INSURANCE COMPAN**

Amount: **\$ 0.00**

Paid: **\$ 0.00**

Available: **\$ 57500.00**

Status: **ACTIVE**

DISCLAIMER

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# DETAILS FOR PUEBLO MECHANICAL AND CONTROLS LLC LICENSE NUMBER ROC 324363

THURSDAY AUGUST 29, 2019 03:08:19 PM

## CONTRACTOR

## LICENSE

NAME / ADDRESS / PHONE

CLASS & DESCRIPTION

**Pueblo Mechanical and Controls LLC**

**Specialty Commercial C-11 Electrical**

6771 E Outlook Dr  
Tucson, AZ 85756-9409  
**Phone:** (800) 840-9170

ENTITY TYPE  
**LLC**

STATUS / ACTION

ISSUED / RENEWAL

**Active**

**First Issued:** 2019-04-28  
**Renewed Through:** 2021-04-30

## QUALIFYING PARTY & PERSONNEL

*The Qualifying Party listed below is associated with this license. All other persons named, if any, are associated with the company. They are not all necessarily associated with this license.*

**Name:** Steven Joseph Barry

**Name:** David John Fortuna

**Name:** Susanne Andrews

**Position:** Qualifying Party

**Position:** Qualifying Party

**Position:** Other

**Other Positions:** EMPLOYEE

**Other Licenses:**

**Other Positions:** Executive

**Other Licenses:**

281606 (/contractor-search?

Administrative Assistant

173953 (/contractor-search? Id=a0Yt000000ACRJsEAP) (Pueblo Mechanical and Controls LLC)

Id=a0Yt000000ACNOMeAP) (Dave Fortuna Inc)

**Other Licenses:**

176640 (/contractor-search?

173953 (/contractor-search?

173953 (/contractor-search?

Id=a0Yt000000ACZHeEAP)

Id=a0Yt000000ACRJsEAP) (Pueblo Mechanical and Controls LLC)

Id=a0Yt000000ACRJsEAP) (Pueblo Mechanical and Controls LLC)

(Pueblo Mechanical and Controls LLC)

176640 (/contractor-search?

176640 (/contractor-search?

260462 (/contractor-search?

Id=a0Yt000000ACZHeEAP)

Id=a0Yt000000ACZHeEAP) (Pueblo Mechanical and Controls LLC)

Id=a0Yt000000ACNAwEAP)

(Pueblo Mechanical and Controls LLC)

260462 (/contractor-search?

(Pueblo Mechanical and Controls LLC)

260462 (/contractor-search?

Id=a0Yt000000ACNAwEAP)

(Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search? Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

**Name:** Daniel Theodore Bueschel

**Position:** Manager

**Other Licenses:**

[173953 \(/contractor-search? Id=a0Yt000000ACRJsEAP\)](#) (Pueblo Mechanical and Controls LLC)

[176640 \(/contractor-search? Id=a0Yt000000ACZHeEAP\)](#) (Pueblo Mechanical and Controls LLC)

[260462 \(/contractor-search? Id=a0Yt000000ACNAwEAP\)](#) (Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search? Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

**Name:** John Paul Beckham

**Position:** FORMER Treasurer

**Other Positions:** Historical Officer

**Other Licenses:**

[171635 \(/contractor-search? Id=a0Yt000000ACIEmEAP\)](#) (Positive Plus Systems Inc)

**Disassociation Date: 2019-01-08**

**Name:** Craig Kenneth Lostutter

**Position:** FORMER Secretary

**Other Positions:** Historical Officer

**Other Licenses:**

[171635 \(/contractor-search? Id=a0Yt000000ACIEmEAP\)](#) (Positive Plus Systems Inc)

(Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search? Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

**Name:** Danielle Marie Lalli

**Position:** Member

**Other Licenses:**

[173953 \(/contractor-search? Id=a0Yt000000ACRJsEAP\)](#) (Pueblo Mechanical and Controls LLC)

[176640 \(/contractor-search? Id=a0Yt000000ACZHeEAP\)](#) (Pueblo Mechanical and Controls LLC)

[260462 \(/contractor-search? Id=a0Yt000000ACNAwEAP\)](#) (Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search? Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

**Name:** Arlene Adair Bleakney

**Position:** FORMER Officer

**Disassociation Date: 2019-01-08**

**Name:** Huron Capital Partners LLC

**Position:** Related Entity, Parent Entity

LLC)

[323201 \(/contractor-search? Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

**Name:** Pamelyn Weatherly Tolloff

**Position:** Chief Financial Officer

**Other Licenses:**

[173953 \(/contractor-search? Id=a0Yt000000ACRJsEAP\)](#) (Pueblo Mechanical and Controls LLC)

[176640 \(/contractor-search? Id=a0Yt000000ACZHeEAP\)](#) (Pueblo Mechanical and Controls LLC)

[260462 \(/contractor-search? Id=a0Yt000000ACNAwEAP\)](#) (Pueblo Mechanical and Controls LLC)

[323201 \(/contractor-search? Id=a0Yt000000B65LPEAZ\)](#) (Pueblo Mechanical and Controls LLC)

**Name:** Robert Dennis DiFusco

**Position:** FORMER Vice President

**Other Positions:** Historical Officer

**Other Licenses:**

[077052 \(/contractor-search? Id=a0Yt000000ACW0FEAX\)](#) (Pueblo Heating and Cooling Inc)

[079382 \(/contractor-search? Id=a0Yt000000ACauoEAD\)](#) (Pueblo Heating and Cooling Inc)

[275879 \(/contractor-search? Id=a0Yt000000ACHkUEAX\)](#) (Robert's Heating & Cooling LLC)

[275880 \(/contractor-search? Id=a0Yt000000ACMF7EAP\)](#) (Robert's Heating & Cooling LLC)

**Disassociation Date: 2019-01-08**

**Name:** Pueblo Holdings LLC

**Position:** Related Entity, Parent Entity

[253141 \(/contractor-search?](#)

[Id=a0Yt000000ACZ8XEAX\)](#)

(Beckham's Electric LLC)

**Disassociation Date: 2019-01-**

**08**

## COMPLAINT INFORMATION

Complaints against this contractor are listed below. Complaints that were cancelled, resolved or settled without a corrective work order or dismissed are not included. Contact the **Registrar of Contractors at 602-542-1525 or toll-free statewide at 1-877-My AZROC (1-877-692-9762)** to identify the ROC office location you need to visit to view complete complaint documentation.

	CLOSED CASES	
	<b>0</b> Open Cases <small>i</small>	<b>0</b> Disciplined Cases <small>i</small>

## BOND INFORMATION

**How to collect from a license bond** (<https://roc.az.gov/recovery-fund?targetclass=answer-question-collect#question-collect>)

Bond Type: **SURETY**

Bond Number: **LSM1240324**

Effective Date: **2019-04-05**

Bond Company: **RLI INSURANCE COMPANY**

Amount: **\$ 2500.00**

Paid: **\$ 0.00**

Available: **\$ 2500.00**

Status: **ACTIVE**

**RFQ 19F-0605 EVALUATOR AGREEMENT AND CONFLICT OF INTEREST FORM**

NAME and TITLE Michael Pentwig Contracts Specialist I EMPLOYER MESC  
 ADDRESS 625 East Beale St. Kingman AZ 86401 PHONE 928-718-3203  
 Contract Specialist working with: Self

**Statement of Understanding***(Initial each section to indicate your understanding of the requirement)*

I agree to evaluate the responses to the solicitation according to its evaluation criteria terms.  
 The RFQ evaluation criteria is as follows:

**Basis of award:** In accordance with Arizona Administrative Code, Article 11, School District Procurement R7-2-1111(C), ARS §34-609(F)(2) and §41-257(F)(2), Mohave shall issue a Request for Proposal to a final list of responsive and responsible vendors determined to be most qualified to perform the specified construction services. To qualify for evaluation, a Statement of Qualifications must have been submitted on time and materially satisfy all mandatory requirements identified in this solicitation.

**Responsive Statement of Qualifications:** A responsive Statement of Qualifications conforms in all respects to the material requirements of the solicitation. The Statement of Qualifications shall be responsive to receive further consideration. Mohave reserves the right to waive minor informalities.

*The Request for Qualifications is the first of a two-step procurement process. Contracts, if any, will be awarded in accordance with the subsequent Request for Proposal. Mohave will issue a Request for Proposal to a final list of responsive and responsible vendors determined to be the most qualified to perform the specified electrical services. The final list shall be at least three, but no more than five offerors.*

I understand that Mohave will consider my evaluation along with evaluations by other professionals. However, I also agree that Mohave is under no obligation to accept my evaluation, except as advisory. I also understand that Mohave will hold my employer and/or me harmless if any vendor or interested party protests any award or lack of award made by Mohave under the terms of this solicitation.

I agree not to discuss my evaluation or any of the evaluation process prior to the announcement of an award, as required by Arizona statute (per ARS § 41-2616, C).

I confirm that I have not received gratuities in the form of entertainment, gifts, or otherwise, that have been offered by any of the bidders responding to this solicitation with a view toward securing a contract.

*Mohave may publicly thank members of the evaluation committee who are not employed by Mohave on our website. By making your selection below, this will indicate your understanding that we may publicly recognize your help with the evaluation process. Please indicate if you do or do not to be thanked in this manner, by indicating with Yes or No answer below:*

(Yes)  (No)

*Please indicate your answer by signing your initials in the appropriate boxes*

New Evaluator

Returning Evaluator

The Arizona Revised Statutes (ARS) place some restrictions with which you must comply regarding conflict of interest not only for yourself but also your relatives (Relative means: spouse, child, child's child, parent, grandparent, siblings (full or half-blood) and their spouses, and the parent, sibling or child of a spouse, pursuant to ARS 38-502). You are required to complete the following form to determine that you're in compliance with these provisions. This form must be completed every time you participate in a contract evaluation.

**Business Interest**

Are you, or any of your relatives, involved in any ownership, employment, public or private affiliations, or special arrangements which may have a substantial (Substantial means: any pecuniary or proprietary interest, either direct or indirect, other than a remote interest) interest in any contract, sale, purchase, or service involving Mohave or any of Mohave's contracts, vendors or members?

No

Yes

Please describe below (attach sheet if necessary):

**Liability**

Violating Arizona's conflict of interest laws have significant consequences which include, but may not be limited to:

1. Intentionally or knowingly violating any provision of sections 38-503 through 38-505 is guilty of a CLASS 6 FELONY.
2. Recklessly or negligently violating any provision of sections 38-503 through 38-505 is guilty of a CLASS 1 MISDEMEANOR.

I understand that I may be held personally liable for costs associated with violating Arizona's conflict of interest laws.

I also acknowledge that I am responsible for knowing and understanding Arizona's conflict of interest laws available in A.R.S. 38-501 through 38-510.

Signature M.Pentwig

Date 6/7/19

Signature by Mohave: Christine M. Jensen

**Mohave Educational Services Cooperative, Inc., 625 E. Beale St. Kingman AZ, 86401**

**RFQ 19F-0605 EVALUATOR AGREEMENT AND CONFLICT OF INTEREST FORM**

NAME and TITLE JEFF BOHNEKAMP - Sr PROJECT MGR EMPLOYER ESB DESIGN+BUILD  
ADDRESS 11780 W ADOLPH ROAD, MARANA, AZ 85648 PHONE 520-683-9004

Contract Specialist working with: \_\_\_\_\_

**Statement of Understanding**

*(Initial each section to indicate your understanding of the requirement.)*

IB I agree to evaluate the responses to the solicitation according to its evaluation criteria terms.  
The RFQ evaluation criteria is as follows:

**Basis of award:** In accordance with Arizona Administrative Code, Article 11: School District Procurement R7-2-1111(C), ARS §31-604(F)(2) and §41-2579(F)(2), Mohave shall issue a Request for Proposal to a final list of responsive and responsible vendors determined to be most qualified to perform the specified construction services. To qualify for evaluation, a Statement of Qualifications must have been submitted on time, and materially satisfy all mandatory requirements identified in this solicitation.

**Responsive Statement of Qualifications:** A responsive Statement of Qualifications conforms in all respects to the material requirements of the solicitation. The Statement of Qualifications shall be responsive to receive further consideration. Mohave reserves the right to waive minor informalities.

*The Request for Qualifications is the first of a two-step procurement process. Contracts, if any, will be awarded in accordance with the subsequent Request for Proposal. Mohave will issue a Request for Proposal to a final list of responsive and responsible vendors determined to be the most qualified to perform the specified electrical services. The final list shall be at least three, but no more than five offers.*

IB I understand that Mohave will consider my evaluation along with evaluations by other professionals. However, I also agree that Mohave is under no obligation to accept my evaluation, except as advisory. I also understand that Mohave will hold my employee and/or me harmless if any vendor or interested party protests any award or lack of award made by Mohave under the terms of this solicitation.

IB I agree not to discuss my evaluation or any of the evaluation process prior to the announcement of an award, as required by Arizona statute (per ARS § 41-2616, C).

IB I confirm that I have not received gratuities in the form of entertainment, gifts, or otherwise, that have been offered by any of the bidders responding to this solicitation with a view toward securing a contract.

*Mohave may publicly thank members of the evaluation committee who are not employed by Mohave on our website. By making your selection below, this will indicate your understanding that we may publicly recognize your help with the evaluation process. Please indicate if wish or do not to be thanked in this manner, by indicating with Yes or No answer below:*

IB (Yes) \_\_\_\_\_ (No) \_\_\_\_\_

*Please indicate your answer by signing your initials in the appropriate boxes*

New Evaluator

Returning Evaluator

The Arizona Revised Statutes (ARS) place some restrictions with which you must comply regarding conflict of interest not only for yourself but also your relatives (Relative means: spouse, child, child's child, parent, grandparent, siblings (full or half-blood) and their spouses, and the parent, sibling or child of a spouse, pursuant to ARS 38-507). You are required to complete the following form to determine that you're in compliance with these provisions. This form must be completed every time you participate in a contract evaluation.

**Business Interest**

Are you, or any of your relatives, involved in any ownership, employment, public or private affiliations, or special arrangements which may have a substantial (Substantial means: any pecuniary or proprietary interest, either direct or indirect, other than a remote interest) interest in any contract, sale, purchase, or service involving Mohave or any of Mohave's contracts, vendors or members?

No

Yes Please describe below (attach sheet if necessary):

ESB has a MOHAVE CONTRACT FOR MODULAR BUILDINGS

**Liability**

Violating Arizona's conflict of interest laws have significant consequences which include, but may not be limited to:

- 1. Intentionally or knowingly violating any provision of sections 38-503 through 38-505 is guilty of a CLASS 6 FELONY.
- 2. Recklessly or negligently violating any provision of sections 38-503 through 38-505 is guilty of a CLASS 1 MISDEMEANOR.

IB I understand that I may be held personally liable for costs associated with violating Arizona's conflict of interest laws.

I also acknowledge that I am responsible for knowing and understanding Arizona's conflict of interest laws available in A.R.S. 38-503 through 38-510.

Signature [Signature]

Date 6/20/19

Signature by Mohave: [Signature]

**Mohave Educational Services Cooperative, Inc., 625 E. Beale St. Kingman AZ, 86401**

**RFQ 19F-0605 EVALUATOR AGREEMENT AND CONFLICT OF INTEREST FORM**

NAME and TITLE Phil Alfred, Asst. City Engineer EMPLOYER City of Kingman  
ADDRESS 310 N 4th Street PHONE (928) 753-8124  
Contract Specialist working with: Mike Nentwig

**Statement of Understanding**

*(Initial each section to indicate your understanding of the requirement)*

I agree to evaluate the responses to the solicitation according to its evaluation criteria terms.  
The RFQ evaluation criteria is as follows:

**Basis of award:** In accordance with Arizona Administrative Code, Article 11: School District Procurement R7-2-1111(C), ARS §38-624(F)(2) and §41-2579(F)(2), Mohave shall issue a Request for Proposal to a final list of responsive and responsible vendors determined to be most qualified to perform the specified construction services. To qualify for evaluation, a Statement of Qualifications must have been submitted on time, and materially satisfy all mandatory requirements identified in this solicitation.

**Responsive Statement of Qualifications:** A responsive Statement of Qualifications conforms in all respects to the material requirements of the solicitation. The Statement of Qualifications shall be responsive to receive further consideration. Mohave reserves the right to waive minor informalities.

*The Request for Qualifications is the first of a two-step procurement process. Contracts, if any, will be awarded in accordance with the subsequent Request for Proposal. Mohave will issue a Request for Proposal to a final list of responsive and responsible vendors determined to be the most qualified to perform the specified electrical services. The final list shall be at least three, but no more than five offerors.*

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I agree not to discuss my evaluation or any of the evaluation process prior to the announcement of an award, as required by Arizona statute (per ARS § 41-2516, C).

I confirm that I have not received gratuities in the form of entertainment, gifts, or otherwise, that have been offered by any of the bidders responding to this solicitation with a view toward securing a contract.

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(Yes)  (No)

**Please indicate your answer by signing your initials in the appropriate boxes**

New Evaluator

Returning Evaluator

The Arizona Revised Statutes (ARS) place some restrictions with which you must comply regarding conflict of interest not only for yourself but also your relatives (Relative means: spouse, child, child's child, parent, grandparent, siblings (full or half-blood) and their spouses, and the parent, sibling or child of a spouse, pursuant to ARS 38-502). You are required to complete the following form to determine that you're in compliance with these provisions. This form must be completed every time you participate in a contract evaluation

**Business Interest**

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No

Yes

Please describe below (attach sheet if necessary):

**Liability**

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- 2. Recklessly or negligently violating any provision of sections 38-503 through 38-505 is guilty of a CLASS 1 MISDEMEANOR.

I understand that I may be held personally liable for costs associated with violating Arizona's conflict of interest laws.

I also acknowledge that I am responsible for knowing and understanding Arizona's conflict of interest laws available in A.R.S. 38-503 through 38-510.

Signature

Phil Alfred

Date

6/10/18

Signature by Mohave:

Christina S. Moore

**Mohave Educational Services Cooperative, Inc., 625 E. Beale St. Kingman AZ, 86401**

**RFQ 19F-0605 EVALUATOR AGREEMENT AND CONFLICT OF INTEREST FORM**

NAME and TITLE Nancy Colbaugh Contracts Manager EMPLOYER MESC, Inc  
ADDRESS 1225 E. Beale Street PHONE 928-7536945  
Contract Specialist working with: Mike Neuberg, CPPB

**Statement of Understanding**

*(Initial each section to indicate your understanding of the requirement)*

NC I agree to evaluate the responses to the solicitation according to its evaluation criteria terms.  
The RFQ evaluation criteria is as follows:

**Basis of award:** In accordance with Arizona Administrative Code, Article 11, School District Procurement R7-2-1111(C), ARS §34-504(F)(2) and §41-2579(F)(2), Mohave shall issue a Request for Proposal to a final list of responsive and responsible vendors determined to be most qualified to perform the specified construction services. To qualify for evaluation, a Statement of Qualifications must have been submitted on time, and materially satisfy all mandatory requirements identified in this solicitation.

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NC I agree not to discuss my evaluation or any of the evaluation process prior to the announcement of an award, as required by Arizona statute (per ARS § 41-2616, C).

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N/A (Yes)  (No)

**Please indicate your answer by signing your initials in the appropriate boxes**

New Evaluator  Returning Evaluator

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No  Yes Please describe below (attach sheet if necessary):

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I understand that I may be held personally liable for costs associated with violating Arizona's conflict of interest laws.

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Signature Nancy Colbaugh Date 6/6/19

Signature by Mohave Amie S. Moore

**RFQ 19F-0605 EVALUATOR AGREEMENT AND CONFLICT OF INTEREST FORM**

NAME and TITLE Michael S. Carter EMPLOYER Mohave Educational  
 ADDRESS 625 E. Beale St. Kingman AZ PHONE 928-753-6945  
 Contract Specialist working with: M. Ke Newberg

**Statement of Understanding***(Initial each section to indicate your understanding of the requirement)*

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(Yes)  (No)

*Please indicate your answer by signing your initials in the appropriate boxes.*

New Evaluator

Returning Evaluator

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No  Yes Please describe below (attach sheet if necessary):

**Liability**

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I understand that I may be held personally liable for costs associated with violating Arizona's conflict of interest laws.

I also acknowledge that I am responsible for knowing and understanding Arizona's conflict of interest laws available in A.R.S. 38-501 through 38-510.

Signature Michael S. Carter Date 6/11/19

Signature by Mohave: Anita S. Moore

**Mohave Educational Services Cooperative, Inc., 625 E. Beale St. Kingman AZ, 86401**

**SAM Search Results**  
**List of records matching your search for :**

**Search Term : Pueblo Mechanical & Controls, LLC\***  
**Record Status: Active**

<b>ENTITY</b>	Pueblo Mechanical and Controls, LLC	Status: Active
DUNS: 105451186	+4:	CAGE Code: 3N3A9 DoDAAC:
Expiration Date: 02/22/2020	Has Active Exclusion?: No	Debt Subject to Offset?: No
Address: 6771 E Outlook Dr		
City: Tucson	State/Province: ARIZONA	
ZIP Code: 85756-9409	Country: UNITED STATES	

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# ARIZONA

DEPARTMENT OF ADMINISTRATION  
PROCUREMENT

(/)

The online home of the Arizona State Procurement Office

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## Suspended and Debarred Firms

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### SUSPENDED AND DEBARRED FIRMS

SPO is responsible for maintaining a list of firms that are suspended or debarred from doing business with the State of Arizona.

**THERE ARE NO SUSPENDED OR DEBARRED FIRMS AT THIS TIME.**



[Contact Us \(/contact-us\)](/contact-us)

**State Procurement Office, ADOA Building**

100 N. 15th Ave., Suite 402

Phoenix, AZ 85007

Find in Google Maps

(<https://www.google.com/maps/place/100+N+15th+Ave+%23201/@33.4490935,-112.0926353,17z>)

[STATEWIDE POLICIES \(HTTP://AZ.GOV/POLICIES\)](http://az.gov/policies)

[SITE MAP \(/SITEMAP\)](/sitemap)



The Due Diligence Tutorial may be downloaded using the following link:

**[Click here to view and download the Due Diligence Tutorial for Mohave Contracts.](#)**

Pricing for this contract may be found at the following link:

**[Click here to go to the Mohave Pricing](#)**

For further assistance contact the Contract Specialist for this contract:

**Michael Carter Specialist, CPPB**

Phone: 928-718-3221

Email: [michael@mesc.org](mailto:michael@mesc.org)

**Price Proposal – Primary Vendor Information**  
**(Place in a clearly marked, separate sealed envelope)**

IF YOUR FIRM WAS SHORTLISTED FOR DIVISION 22 PLUMBING, DIVISION 23 HEATING, VENTILATION AND AIR CONDITIONING OR DIVISION 26 ELECTRICAL, PROVIDE COEFFICIENTS AND PRICING INFORMATION FOR BOTH DIVISIONS OR INDICATE IF THE COEFFICIENTS WILL BE IDENTICAL FOR BOTH DIVISIONS.

Price Proposal shall be submitted in a clearly marked, separate sealed envelope. Offeror shall provide a price proposal to include the following information:

1. **Name and Date of the Unit Price Book (UPB):**
2. **Coefficient(s) to be applied to pre-priced items (items listed in the UPB) for work performed during:**
  - Normal business hours (Monday - Friday 7 a.m. - 5 p.m.)
  - Other hours (after hours, weekends, and holidays)
  - Note adjustments to the coefficient(s), if applicable, for work performed in different regions of the state.
3. **Coefficient(s) to be applied to non pre-priced items (items not listed in the UPB) for work performed during:**
  - Normal business hours (Monday - Friday 7 a.m. - 5 p.m.)
  - Other hours (after hours, weekends, and holidays)
  - Note adjustments to the coefficient(s), if applicable, for work performed in different regions of the state.

**Notes:** Provide a brief explanation of the rationale for your coefficients. The rationale should indicate how you determined the cost of doing the work and the various elements that made up your coefficients. See Specification 1.2.13, Pricing, for additional information.

4. **Open Book Pricing Workbook:**

**NOTE: *The workbook contains cells that include formulas to calculate total costs. Do not override the formulas within these cells.***

If offeror is including the Open Book Pricing methodology in their price proposal, the Open Book Price workbook shall be completed as follows:

- Provide complete information in the worksheet titled, “*Price Summary*” in the electronic Open Book Price workbook titled, “*19F-0808 Open Book Price Summary.xlsx*” includes yellow highlighted cells for *General and Administrative Cost (G&A)* and *Profit*. Place the percentage value your firm will use to calculate overhead and profit for the Direct Project Costs and General Conditions.
- The worksheet titled, “*General Conditions*” in the electronic Open Book Price workbook titled, “*19F-0808 Open Book Price Summary.xlsx*”, includes general conditions, services, or costs not identified or included in the subcontractor quotations.
- Provide the labor and/or service unit price for the yellow highlighted cells in the section titled, *Admin Fee Items: Unit Price*. Additionally, include the unit of measure (e.g. per hour, per day, per week) as applicable in the *Unit Of Measure* column.
- Provide additional costs as applicable for yellow highlighted cells in the section titled, *Non-Admin Fee Items*. Non-Admin Fee items include costs that are “passed-through” to member at cost to the contract vendor. *Mohave shall not collect administration fees on the above non-admin fee items.*
- Add line items to the Admin and/or Non-Admin Fee schedules as necessary.
- **Only services/ costs identified in this price schedule will be allowed under an awarded contract.**
- This workbook will serve as your quoting template for all open book projects under an awarded contract.

**Price Proposal – Primary Vendor Information**  
**(Place in a clearly marked, separate sealed envelope)**

5. **Trade Service Price Guides for items and services not included in the UPB:**
  - The pricing methodology to determine the Mohave price shall be:
    - Discount off list (specify discount).
    - Discount off Column Two (specify discount) when List Price is unavailable.
6. **Professional Services (Provide the applicable hourly rate for each service offered. No coefficient will be applied to these rates.)**
  - Design Services
  - Engineering Services
  - Other Professional Services (specify service and rate)
7. **Maintenance Services and Extended Warranties (Provide the cost for all maintenance services and extended warranties that are available after the warranty period. No coefficient will be applied to these prices.)**
8. **Other Charges (Provide any additional costs, or incidental charges. Such charges may include the items listed below. No coefficient will be applied to these charges.)**
  - 100% Performance and Payment Bonds
  - Meals and incidental expenses (M&IE), transportation and lodging
  - Mobilization (Indicate when mobilization charges would apply.)  
*NOTE: Mobilization may only be used with projects priced using Trade Service and labor. Mobilization charges shall not be allowed with UPB or Open Book Pricing methodologies.*
  - Other
9. Will you offer members a quick pay discount if payment is made within 10 or 20 days? Yes \_\_\_ No X
  - If Yes, what is the discount for 10 days? \_\_\_\_\_ 20 days? \_\_\_\_\_

**Travel Description**

If travel rates are applicable, describe how they are calculated, and when they are necessary, (e.g. 50 miles from origin). Include information regarding what the travel rates cover. (See **Pricing: Reimbursement for Transportation, Mileage, Lodging, Meals and Incidental Expenses** in the Special Terms and Conditions.)

Travel rates are applicable when work sites exceed 50-mile radius from our current Tucson and Phoenix office locations. In some

cases overnight lodging will not be required if it is more cost effective to travel to the work site daily versus overnight stays.

Meals & Incidentals are only applicable for work involving overnight accommodations.

**Bond Methodology Description**

Provide detailed information explaining the methodology to be used when bonds are applied to projects. Describe in detail the method your surety company requires you to use (e.g., bonds are applied before sales tax is applied, bonds are applied after sales tax is applied). Mohave will use this information to verify that your firm is consistently charging bonds in the same manner under an awarded contract.

The use of bonds is based on current state legislation and owners' requirements. Projects under \$100,000 do not require bonding

Unless specifically requested by the owner, all proposals will include this language. Bonding cost is calculated based on the total price obligation.



**2. Coefficients - Pre-Priced Primary UPB Coefficients [RS Means CostWorks]:**

**APPLIES TO ALL DIVISIONS**

Normal Business Hours [M-F 7am – 5pm]: .85  
 Other Hours [Weekends, holidays, etc.]: .95  
 Adjustments to the coefficient(s), if applicable  
 for work performed in different regions of the state: N/A - None

**Professional Services**

Design Services [Mechanical/Electrical]: \$116.00/hr.  
 Engineering Services: \$120.00/hr.  
 Principal Engineering Services: \$142.00/hr.

**Other Professional Services**

Drafting [CAD] Design: \$92.00/hr.  
 Architect: \$142.00/hr.  
 Principal Architect: \$160.00/hr.

**Maintenance and Other Services [based on hourly labor rates]:**

Duty Position	Normal Hours	After Hours / Emergency Hours	Holidays
HVAC Chiller Tech [Wetside Applications]	\$104.00/hr.	\$142.00/hr.	\$176.00/hr.
HVAC Unitary Tech [Dryside Applications]	\$99.00/hr.	\$136.00/hr.	\$168.00/hr.
Pipefitter / Steamfitter	\$94.00/hr.	\$129.00/hr.	\$159.00/hr.
Sheet Metal Installation	\$74.00/hr.	\$101.00/hr.	\$125.00/hr.
Plumber	\$98.00/hr.	\$134.00/hr.	\$166.00h/hr.
Water Treatment	\$101.00/hr.	N/A	N/A
HVAC Building Automation Tech – Controls/Programing	\$98.00/hr.	\$134.00/hr.	\$166.00/hr.
Project Manager / Quality Control	\$96.00/hr.	\$131.00/hr.	\$163.00/hr.
Electrical [by PMAC]	\$87.00/hr.	\$119.00/hr.	\$147.00/hr.
General Labor	\$50.00/hr.	\$68.00/hr.	\$85.00/hr.

**Note: Labor rates above are all inclusive, no other factors or mark-ups are applied**

**Note: Normal hours are 7:00 am – 5:00 pm Monday – Friday [Excluding holidays]  
 Other Charges**



**3. Coefficients - Custom or Special Non-Prepriced Items Not Found in UPB or TRA-SER [Pricing based on three quotes when available; single source or customer mandated items due to specific specifications are available if they comply with contract requirements]**

Normal Business Hours [M-F 7am – 5pm]: **1.20**  
 Other Hours [Weekends, holidays, etc.]: **1.20**  
 Adjustments to the coefficient(s), if applicable  
 for work performed in different regions of the state: **N/A - None**

**NOTE:** The use of the non-prepriced pricing option will only take place when the equipment/supplies are not listed in primary or secondary costing and include a statement clearly indicating that pricing is not available via other pricing methodologies

**Explanation Notes:** Established coefficients represent the minimum realistic cost estimate to capture direct/indirect costs, overhead, and a sustainable profit. The coefficients represent project cost averages based on project spanning 15 years of UPB utilization.

**4. Open Book Pricing Workbook/Summary:**

**Name of Pricing Source:** 19F-0808 Open Book Price Summary Excel Spreadsheet – Jul 19

**General & Administrative Cost (G&A)** 10%

**Profit** 5%

**General Conditions** Derived from Open Book pricing spreadsheet General Conditions Tab

<b>Duty Position [Direct Company Labor]</b>	<b>Normal Hours</b>	<b>After Hours / Emergency Hours</b>	<b>Holidays</b>
Project General Manager	\$94.00/hr.	\$129.00/hr.	\$159.00/hr.
Project Manager	\$83.00/hr.	\$114.00/hr.	\$141.00/hr.
Estimator	\$77.00/hr.	\$105.00/hr.	\$131.00/hr.
Senior Superintendent	\$77.00/hr.	\$105.00/hr.	\$131.00/hr.
Superintendent	\$72.00/hr.	\$99.00/hr.	\$122.00/hr.
CQC Inspector	\$77.00/hr.	\$105.00/hr.	\$131.00/hr.
Safety Manager	\$83.00/hr.	\$114.00/hr.	\$141.00/hr.

Field Engineer	<b>\$94.00/hr.</b>	<b>\$129.00/hr.</b>	<b>\$159.00/hr.</b>
Administrative Assistant	<b>\$58.00/hr.</b>	<b>\$79.00/hr.</b>	<b>\$98.00/hr.</b>
HVAC Chiller Tech [Wetside Applications]	<b>\$90.00/hr.</b>	<b>\$123.00/hr.</b>	<b>\$153.00/hr.</b>
HVAC Unitary Tech [Dryside Applications]	<b>\$86.00/hr.</b>	<b>\$118.00/hr.</b>	<b>\$146.00/hr.</b>
Pipefitter / Steamfitter	<b>\$82.00/hr.</b>	<b>\$112.00/hr.</b>	<b>\$139.00/hr.</b>
Sheet Metal Installation	<b>\$64.00/hr.</b>	<b>\$88.00/hr.</b>	<b>\$108.00/hr.</b>
Water Treatment	<b>\$88.00/hr.</b>	<b>\$121.00/hr.</b>	<b>\$149.00/hr.</b>
Plumber	<b>\$85.00/hr.</b>	<b>\$116.00/hr.</b>	<b>\$144.00/hr.</b>
Electrical [by PMAC]	<b>\$68.00/hr.</b>	<b>\$93.00/hr.</b>	<b>\$115.00/hr.</b>
HVAC Building Automation Tech – Controls/Programing	<b>\$85.00/hr.</b>	<b>\$116.00/hr.</b>	<b>\$144.00/hr.</b>
General Labor / Driver	<b>\$43.00/hr.</b>	<b>\$59.00/hr.</b>	<b>\$73.00/hr.</b>
In-House Design Services [Mech/Electric]	<b>\$101.00/hr.</b>	<b>\$138.00/hr.</b>	<b>\$171.00/hr.</b>
In-House Drafting [CAD] Design	<b>\$80.00/hr.</b>	<b>\$110.00/hr.</b>	<b>\$136.00/hr.</b>

**See detailed Open Book Breakout Below:**

**5. Trade Service [TRA-SER] Price Guides/Summary:**

**Name/Date of Pricing Source:** TradeService eDataFlex

**Note:** TRA-SER equipment pricing is also available as a stand-alone pricing option

Normal Business Hours [M-F 7am – 5pm]: **.90 [List Price Column]**

Other Hours [Weekends, holidays, etc.]: **.90 [List Price Column]**

Discount off Column Two when List Price not avail. TBD

**Note:** Labor rates are listed above in the UPB section; no additional mark-up is applied to these rates

**Note:** TRA-SER pricing may be combined with UPB pricing to provide a complete turn-key solution

**6. Professional Services:**

**Professional Services**

Design Services [Mechanical/Electrical]: **\$105.00/hr.**

Principal Engineering Services: **\$130.00/hr.**

**Other Professional Services**

Drafting [CAD] Design: **\$83.00/hr.**

Architect: **\$130.00/hr.**

**7. Maintenance Services and Extended Warranties:**

Factory or Misc. Formal Training / Instruction: **Direct Cost**

Maintenance Services **Labor/Materials IAW standard JOC pricing [Trade Service/UPB]**

Extended Warranties [if available through manufacturer and/or vendor] **Direct Cost**

Member		Date	
Project Title			
Project Location			

**NOTE: The workbook contains cells that include formulas to calculate total costs. Do not override the formulas within these cells.**

This worksheet is for the detailed information and pricing for quotations from subcontractors, and the General and Administrative Cost (G&A) and Profit.

To complete the portion required for your price proposal, place the percentage value your firm will use to calculate overhead and profit for the Direct Project Costs and General Conditions in the yellow highlighted cells.

*This workbook will serve as your quoting template for all open book projects under an awarded contract. After completion of this worksheet, you may delete this textbox in your template.*

**Direct Project Cost**

Division/Specialty	#	Quote Summary		Selected Quote
		Subcontractor	Quote Amount	
	1			
	2			
	3			
	1			
	2			
	3			
	1			
	2			
	3			
	1			
	2			
	3			
	1			
	2			
	3			
	1			
	2			
	3			
Subtotal 1 (Total Direct Project Cost)				<b>\$0.00</b>
General Conditions (GCs) Adminfeeable				\$ -
General Conditions (GCs) Admin Fee				\$ -
General Conditions (GCs) Total Without Admin Fee				\$ -

Subtotal 2 (Direct Project Cost + General Conditions) **\$0.00**

**General & Administrative Cost (G&A)**  % of Subtotal 2   
 (Enter applicable G&A Percentage)

Subtotal 3 (Subtotal 2 + G&A) **\$0.00**

**Profit**  % of Subtotal3   
 (Enter applicable profit percentage)

Subtotal 4 (Subtotal 3 + Profit) **\$0.00**

**Total Amount Subject to Mohave Admin Fees (based on costs including O&P)**  **Total of Adminfeeable Amounts**  
 **Total Admin fee due**

**General Conditions (GCs) (non-adminfeeable)**

**Tax (Enter applicable tax rate)**

**Bond, if applicable (Enter applicable unit price)**

**Total Project Cost**

**\* Provide vendor name & explanation if low quote is not selected.**




## 8. Other Charges – Miscellaneous Pricing:

100% Performance/Payment Bonds:	<b>1.50% of project cost</b>
<b>Note:</b> P/P bonds are calculated based on the <u>total</u> project cost [base price + tax]	
Meals and Incidental Expenses (M&IE):	<b>Per AZ State rates</b>
Transportation and Lodging:	<b>Per AZ State rates</b>
<b>Note:</b> M&IE, travel, and lodging are only applicable outside 50 mile radius of Tucson & Phoenix offices	
Expedited Shipping:	<b>Direct Cost</b>
Factory or Misc. Formal Training / Instruction:	<b>Direct Cost</b>
Credit Card / P Card Fees [when applicable]:	<b>Direct Cost + 1%</b>
Mobilization	<b>No additional charges other than allowed as pre-priced line items in the UPB, Open Book, or TRA-SER</b>
Maintenance Services	<b>Labor/Materials IAW standard JOC pricing</b>
Extended Warranties [if available through manufacturer and/or vendor]	<b>Direct Cost</b>
Permits or other direct construction fees:	<b>Direct Cost</b>
Additional Print Sets or Extra O&M Manuals	<b>Direct Cost</b>
Miscellaneous Admin Fees Not Included Above [E.g. Native American TERO or other tribal fees, etc.]:	<b>Direct Cost</b>

## 9. Quick Pay Discounts:

Will you offer members a quick pay discount if payment is made within 10 or 20 days? Yes \_\_\_\_\_ No **X**



# Solicitation as Issued

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4/5/18 EH



# Request for Qualifications 19F-0605 Job Order Contracting for Various Construction Trades

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Click section title to be taken directly to that section.



## **REQUEST FOR QUALIFICATIONS 19F-0605**

### **Job Order Contracting for Various Construction Trades**

Pursuant to the provisions in the Arizona procurement rules and code, Mohave Educational Services Cooperative, Inc. seeks Statements of Qualifications to establish contract(s) for Job Order Contracting for Various Construction Trades. A copy of this RFQ is available for public inspection at 625 East Beale Street, Kingman, AZ 86401.

**Due Date and Time: Wednesday, June 5, 2019 at 3:00 p.m. (local Arizona time)**

**Pre-Qualifications Conference: Wednesday, May 15, 2019 at 10:00 a.m. (local Arizona time)**  
**Meeting Bridge Conference Call – Audio Only**  
**For login information contact Michael Nentwig,**  
**no later than Tuesday, May 14, 2019.**

**Last Day for Questions: Wednesday, May 29, 2019 at 5:00 p.m. (local Arizona time)**

**Request for Qualifications Questions Must Be Directed To:**

Michael Nentwig, CPPB, Contract Specialist I  
Email: [contracts@mesc.org](mailto:contracts@mesc.org)  
Telephone: (928) 718-3203

**To be considered, Statements of Qualifications shall be delivered to Mohave Educational Services Cooperative, Inc. (Attn: Contracts Dept.), 625 East Beale Street, Kingman, AZ 86401** in a sealed envelope or package with RFQ 19F-0605, offeror's name, mailing address, and Statement of Qualifications due date and time clearly indicated on the envelope or package. Statements of Qualifications must be in the actual possession of Mohave on, or prior to, the exact time and date indicated above. Statements of Qualifications shall be opened immediately following the Statement of Qualifications due date and time, with the name of each offeror publicly read and recorded. Late Statements of Qualifications shall not be considered. Kingman is considered a "rural" area by many express delivery carriers and thus, they do not guarantee priority (next day) delivery by a specific time. Prospective offerors are encouraged to keep this in mind when arranging delivery of their Statement of Qualifications and are advised herein that late Statements of Qualifications shall be handled as specified by Arizona procurement rules and code.

Offerors are strongly encouraged to carefully read the entire contents of this solicitation prior to submitting a Statement of Qualifications. Failure to examine any of the requirements will be at the offeror's risk.

Mohave reserves the right to cancel this solicitation and/or reject all Statements of Qualifications in whole, or in part, if Mohave determines that cancellation and/or rejection is advantageous to Mohave and/or its members.

A handwritten signature in black ink that reads 'Anita S. McLemore'.

**Anita S. McLemore, C.P.M.**  
**Executive Director**  
**Mohave Educational Services Cooperative, Inc.**

**Publish Date: May 1, 2019**

**Offer and Signature Form**  
**(Place after Tab 1a)**

**Request for Qualifications 19F-0605**  
**Job Order Contracting for Various Construction Trades**

***To Mohave Educational Services Cooperative, Inc.:***

The undersigned hereby offers a Statement of Qualifications in compliance with all terms and conditions, requirements and amendments in the solicitation and any written exceptions in the offer. Signature also certifies understanding and compliance with the certification requirements in the General Terms and Conditions.

Federal Employer Identification Number \_\_\_\_\_

Company Name \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone Number \_\_\_\_\_

The *Offer and Signature Form* shall be submitted with a signature of the person authorized to sign the offer. The person signing the offer shall initial erasures, interlineations or other modifications in the Statement of Qualifications. Failure to sign the *Offer and Signature Form*, or to make other notations as indicated, may result in rejection of the Statement of Qualifications.

**Authorized Signature** \_\_\_\_\_

Printed Name \_\_\_\_\_ Title \_\_\_\_\_

Primary Email \_\_\_\_\_ Alternate email \_\_\_\_\_

*Note: The primary email address will be used for all communication from Mohave regarding your response to this solicitation. Provide an alternate email address that will be used **only** if the primary email address is not valid.*

**Confidential/Proprietary Submittal Form**  
**(Place after Tab 1a)**

**CONFIDENTIAL/PROPRIETARY SUBMITTALS**

Confidential/Proprietary Submittals (mark one):

\_\_\_\_\_ No confidential/proprietary materials have been included with this Statement of Qualifications.

\_\_\_\_\_ Confidential/proprietary materials have been included with this Statement of Qualifications. Offerors shall identify below any portion of their Statement of Qualifications deemed confidential or proprietary (see General Terms and Conditions 4. Confidential Information).

*Note that any documentation marked as confidential or proprietary must be identified below. Any confidential or proprietary information NOT identified as instructed shall be deemed as non-confidential or non-proprietary.*

The confidential/proprietary information identified below does not guarantee that disclosure will be prevented but that the item(s) will be subject to review by the offeror and Mohave prior to any public disclosure. Requests to deem the entire offer or pricing as confidential shall not be considered.

\_\_\_\_\_  
Firm

\_\_\_\_\_  
Authorized Signature

**Instructions to Offeror and Checklist Form**  
**(Place after Tab 3a)**

You have received this solicitation because of information you provided on Mohave's "online prospective bidders sign-up." **Review this document in its entirety to make sure you fully understand the services and products that we are requesting.** Please do not assume a particular form, section, or requirement does not, or should not, apply to you. Contact Mohave at [contracts@mesc.org](mailto:contracts@mesc.org) with questions.

We have included this checklist to assist you in preparing your response. Follow each step, placing the required information in your response binder in the proper place. **All of the items listed below are required.** Initial next to each item to indicate completion.

**PRICING SHALL NOT BE INCLUDED IN YOUR STATEMENT OF QUALIFICATIONS.**

\_\_\_\_\_ **Step ONE:** Read and understand the document. You are responsible for asking any questions regarding the information you are required to include with your response. Do not hesitate to contact the Contract Specialist as shown on page 1 for clarification on any items contained in this solicitation.

\_\_\_\_\_ **Step TWO:** One (1) original and five (5) additional complete copies of your Statement of Qualifications shall be submitted in separate three-ring loose-leaf binders in the format detailed below. Statements of Qualifications shall contain all descriptive literature, submittal requirements, and any other information required by the solicitation. Include two (2) CD, USB, or similar electronic media device containing electronic copies of your submitted documents with each binder.

Statements of Qualifications must be completed in ink, on a computer, or typewritten. No pencil submissions are allowed. Forms may be filled out by hand, but shall be legible.

\_\_\_\_\_ **Step THREE:** Statement of Qualifications shall be organized and presented in the order as required below, with separate tabs and sub-tabs (e.g. 1a, 1b) and dividers.

\_\_\_\_\_ **Step FOUR:** Confirm that the Statement of Qualifications is complete and signed on page 2 by an authorized representative.

\_\_\_\_\_ **Step FIVE:** Keep a complete copy of your Statement of Qualifications for your records.

\_\_\_\_\_ **Step SIX:** Statements of Qualifications shall be submitted to the proper location in a sealed and properly identified envelope or package, as specified on page 1 of this solicitation. Statements of qualifications must be in the actual possession of Mohave on, or prior to, the exact time and date set for Request for Qualifications opening. Pricing is not requested in the Statement of Qualifications and shall not be included in your response.

A Request for Qualifications tabulation (a list of respondents) will be posted at [www.mesc.org](http://www.mesc.org) within one week of the RFQ opening.

**Tab and Sub-tab Arrangement**

• **Tab 1: Offer and Signature Form, General Terms and Conditions, and Scope of Work**

\_\_\_\_\_ **Tab 1a** – The signed *Offer and Signature Form* is placed after Tab 1a.

\_\_\_\_\_ A copy of suspension or debarment letter (if applicable) is placed after Tab 1a.

\_\_\_\_\_ A copy of the *Confidential/Proprietary Submittal Form* is placed after Tab 1a.

\_\_\_\_\_ **Tab 1b** – Signed amendments, if any, are placed after Tab 1b.

\_\_\_\_\_ **Tab 1c** – A complete copy of the General Terms and Conditions is placed after Tab 1c. *(Note: Unless and until the District Court's injunction in Jordahl v. Brnovich is lifted or stayed, the Anti-Israel Boycott Provision (A.R.S. §35-393.01 (A)) is unenforceable and Mohave will take no action to enforce it.)*

**Instructions to Offeror and Checklist Form**  
**(Place after Tab 3a)**

\_\_\_\_\_ A completed copy of the *General Terms and Conditions Acceptance Form* is placed after Tab 1c. Any exceptions to the General Terms and Conditions are noted and explained.

\_\_\_\_\_ **Tab 1d** – A copy of the Scope of Work is placed after Tab 1d.

• ***Tab 2: Statement of Qualifications***

\_\_\_\_\_ **Tab 2** – A complete response to the Statement of Qualifications pages is placed after Tab 2, with the following sub-tabs as described.

\_\_\_\_\_ **Tab 2a** – Table of Contents is placed after Tab 2a.

\_\_\_\_\_ **Tab 2b** – Letter of Introduction is placed after Tab 2b.

\_\_\_\_\_ **Tab 2c** – Basic Company Information is placed after Tab 2c.

\_\_\_\_\_ **Tab 2d** – General and/or Specialty Contracting information is placed after Tab 2d.

\_\_\_\_\_ **Tab 2e** – Form of Ownership is placed after Tab 2e.

\_\_\_\_\_ **Tab 2f** – Company Personnel Information is placed after Tab 2f.

\_\_\_\_\_ A completed Standard Form 330 is placed after Tab 2f.

\_\_\_\_\_ **Tab 2g** – A complete List of Consultants and Subcontractors is placed after Tab 2g

\_\_\_\_\_ **Tab 2h** – Financial Information is placed after Tab 2h.

\_\_\_\_\_ **Tab 2i** – A current certificate or certificates of insurance (**see General Term and Condition 10.1 Insurance**) is placed after Tab 2i.

\_\_\_\_\_ **Tab 2j** – Past Performance information is placed after Tab 2j.

\_\_\_\_\_ **Tab 2k** – Contract Management Plan is placed after Tab 2k.

\_\_\_\_\_ **Tab 2l** – Quality Management Plan is placed after Tab 2l.

\_\_\_\_\_ **Tab 2m** – Subcontractor Management Plan is placed after Tab 2m.

\_\_\_\_\_ **Tab 2n** – Safety Plan is placed after Tab 2e.

• ***Tab 3: Additional Information***

\_\_\_\_\_ **Tab 3a** – Completed *Instructions to Offeror and Checklist Form* is placed after Tab 3a.

\_\_\_\_\_ **Tab 3b** – Descriptive literature, slicks and any other supporting printed data are placed after Tab 3b.

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## Scope of Work (Place after Tab 1d)

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### 1. DESCRIPTION

In order to gain economies of scale, Mohave is formally soliciting sources for Job Order Contracting for Various Construction Trades as specified within this Request for Qualifications. These services are requested for Mohave's statewide membership of approximately 450 public agencies. However, other members may be added during the term of an awarded contract(s). A current list of all members can be found on Mohave's website at [www.mesc.org](http://www.mesc.org).

Mohave may procure, as an entity for its membership, construction and construction service contracts, as applicable, using the following project delivery method: Job Order Contracting, as stated in Arizona Administrative Code, Article 11: School District Procurement R7-2-1102 through R7-2-1115, ARS §34-602(A)(4) and §41-2582(A)(4). Mohave's use of alternative project delivery methods for construction contracts is in accordance with the Arizona Administrative Code, Article 11: School District Procurement R7-2-1106 through R7-2-1115, ARS §34-604 and §41-2579. Services shall be procured in accordance with the Arizona Administrative Code, Article 11: School District Procurement and ARS §34-604 and §41-2579.

This Request for Qualifications is the first of a two-step procurement process. Contracts, if any, will be awarded in accordance with the subsequent Request for Proposal. Mohave will issue a Request for Proposal to a final list of responsive and responsible vendors determined to be the most qualified to perform the specified construction services. The final list shall include a maximum of twenty total persons/firms, consisting of up to five firms for each specialty contracting divisions listed. Mohave is stating that three specialty contracting divisions will be considered beyond general contracting. Of these possible twenty firms no more than five contracts will be awarded per division for multiple contracts for similar job order contracting construction services to separate persons/firms.

Because any work under this contract will be on a job order basis, exact project details are not available. General information on the project site, scope of work, schedule, project design and construction budget, or life cycle budget information shall be provided by members prior to usage of awarded contracts. Specifications will be included in the subsequent Request for Proposal issued to firms whose Statements of Qualifications make the final list. Those specifications will form the basis for any work to be performed. The specifications are intended to indicate the requirements of Mohave's members, which will include generally accepted practices in the construction industry.

**For purposes of this Request for Qualifications, specialty contracting divisions requested are Division 22, Plumbing; Division 23 Heating, Ventilation, and Air Conditioning; and Division 26, Electrical.**

Mohave has current contracts for related work (e.g., electrical, JOC fencing, flooring, roofing, electronic safety and security, fire suppression, painting, asphalt paving, plumbing). Any contract awarded as a result of this Request for Qualifications will be in addition to those contracts but will not replace them. The Mohave member shall retain the right to determine which contracts are in their best interests.

Mohave desires to contract with a qualified and experienced offeror, or offerors, to provide quality Job Order Contracting (JOC) for various construction trades for Mohave's statewide membership. Various construction trades in the subsequent Request for Proposals may include, but not be limited to: construction, repair, rehabilitation and alteration services.

Under JOC, a master contract is established with standard specifications and pricing based upon a coefficient that is applied to a Unit Price Book (UPB). Pricing may also be established through an Open Book Pricing methodology. Open Book pricing allows the contract vendor to apply subcontractor price quotes and total direct project costs to a predetermined General and Administrative percentage and profit mark-up. Trade Service along with an established labor hourly rate may be used for service and repair projects. When a JOC order is issued, the member and the contract vendor agree on the scope of work, pricing methodology to be used, and the cost is determined by applying the agreed upon pricing methodology to the entire project. **Statements of Qualifications shall not include pricing, coefficients or General and Administrative percentage and profit mark-up information.**

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**Scope of Work  
(Place after Tab 1d)**

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Mohave currently has two active and one expired JOC contracts (14G-0808) for general contracting. Activity under the contracts from 09/03/14 including year to date activity (as of the publication date of this RFQ) is \$101,558,666.

Mohave currently has one JOC contract (14G-0808) for Division 23. Activity under this contract from 09/03/14 including year to date activity (as of the publication date of this RFQ) is \$84,207,330.

This information is provided as an aid to vendors in preparing Statements of Qualifications only. If awarded a contract under a subsequent RFP, the coefficient(s) and any other pricing shall apply regardless of the dollar volume of orders under the contract. Work shall be performed at various locations statewide.

**2. ESTIMATED TIMELINE OF EVENTS**

Mohave has developed the following estimated timeline of events related to this formal solicitation. All dates are subject to change as required and at the sole discretion of Mohave.

<b>EVENT</b>	<b>ESTIMATED DATE</b>
Request for Qualifications Issued	May 1, 2019
Pre-qualifications Conference Held	May 15, 2019 at 10:00 a.m. (local AZ time) Pre-qualifications conference will be held using <i>Meeting Bridge</i> telephone conferencing. Please contact Mohave for reservation details.
Deadline for Questions	May 29, 2019 at 5:00 p.m. (local AZ time)
Published Request for Qualifications Due Date and Time	June 5, 2019 at 3:00 p.m. (local AZ time) 625 East Beale Street, Kingman, AZ 86401
Public Opening of Request for Qualifications	June 5, 2019 at 3:00 p.m. (local AZ time)
Selection of Final List ( <i>estimated date only</i> )	June 14, 2019 NOTE: Notification will be sent by email to all selectee(s) and non-selectee(s) for the final list on or before this date.
Request for Proposals Issued ( <i>estimated date only</i> )	July 1, 2019

**3. SUBMISSION OF STATEMENT OF QUALIFICATIONS**

**3.1.** The Statement of Qualifications shall provide straightforward, concise information that satisfies the requirements. Expensive bindings and/or color displays are not necessary. Emphasis should be placed on conformity to the terms and conditions, as well as the completeness and clarity of the submittal content.

**3.2.** The offeror must submit its Statement of Qualifications following information detailed in the *Instructions to Offeror and Checklist Form*.

**3.3.** A Statement of Qualifications submitted in response to this solicitation shall be valid and irrevocable for one hundred twenty (120) days after opening date and time.

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**Scope of Work  
(Place after Tab 1d)**

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**4. CONTRACT TYPE**

No contracts shall be awarded from this Request for Qualifications. However, contracts for an initial one (1) year term and four (4) potential one-year extensions will be awarded in the subsequent Request for Proposal.

**5. EVALUATION CRITERIA**

The weighted award criteria for this solicitation, in relative order of importance, are as follows:

<b>Criteria</b>	<b>Points</b>
Offeror's qualifications and experience	40
Quality of the Statement of Qualifications	20
Offeror's contract management plan	10
Offeror's quality management plan	10
Offeror's subcontractor management plan	5
Offeror's financial capacity	5
Offeror's safety record	5
References, past performance information and other pertinent information	<u>5</u>
<b>Total</b>	<b>100</b>

**References and definitions used for specifications:** (acronyms used in the solicitation are noted in bold font below):

Construction Specifications Institute: [www.csiresources.org](http://www.csiresources.org)

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**General Terms and Conditions**  
**(Place after Tab 1c)**

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**Some General Terms and Conditions specify placement of information in tabs other than Tab 1c as noted in the title above. Pay close attention to placement information (identified in bold text) as indicated in select General Terms and Conditions.**

**1. AVAILABILITY OF FUNDS**

Member funding availability is unknown to Mohave at the time this solicitation was issued. Use of any contract awarded by Mohave will be conditioned upon the availability of member funds.

**2. CAPTIONS, HEADINGS AND ILLUSTRATIONS**

The captions, illustrations, headings, and subheadings in this solicitation are for convenience and ease of perusal only, and in no way define, limit or describe the scope or intent of the request.

**3. CERTIFICATION**

By signing the *Offer and Signature Form* (page 2 of the Request for Qualifications), offeror certifies the following:

- Offeror has examined and understands the terms, conditions, scope of work, and other documents in this solicitation.
- The submission of the offer did not involve collusion or other anticompetitive practices. Neither signatory nor any person on his behalf has connived or colluded to produce a deceptive show of competition in the matter of the bidding or award of a contract under this solicitation.
- Offeror has not given, offered to give, nor intends to give at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a public servant in connection with the submitted offer.
- Neither offeror, nor any officer, director, partner, member or associate of offeror, nor any of its employees directly involved in obtaining contracts with the State of Arizona, Mohave Educational Services Cooperative, Inc., or any subdivision of the state has been convicted of false pretenses, attempted false pretenses, or conspiracy to commit false pretenses, bribery, attempted bribery or conspiracy to bribe under the laws of any state or federal government for acts or omissions after January 1, 1985.
- Offeror agrees to comply fully with any and all provisions of ARS, Title 32, Chapter 10 (Registrar of Contractors) that may regulate offeror's business.
- Offeror shall not discriminate against any employee, or applicant for employment, in violation of federal and state laws (see Federal Executive Order 11246; and ARS, Title 41, Chapter 9, Article 4).
- Offeror is not currently suspended, debarred or otherwise precluded from participating in any public procurement activity with any federal, state or local government entity.
- If awarded a subsequent contract, offeror agrees to promote, offer and sell under Mohave contract only those materials and/or services awarded to contract vendor by Mohave.
- If awarded a subsequent contract, offeror shall provide the equipment, commodities, and/or services to members of Mohave in accordance with the terms, conditions, scope of work, specifications, and other documents of this Request for Qualifications and the subsequent Request for Proposal.
- If awarded a subsequent contract, offeror agrees that all staff and other individuals eligible to receive services shall have equal access to the services regardless of race, religion, color, sex, disability, age or national origin (including language minority individuals).
- Offeror and all proposed subcontractors comply and shall remain in compliance with the Federal Immigration and Nationality Act (FINA), all other current federal immigration laws and regulations, ARS §41-4401, and ARS §23-214, which requires compliance with current federal immigration laws by Arizona employers, Arizona contractors and Arizona subcontractors in accordance with the E-Verify employee eligibility verification program.

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**General Terms and Conditions**  
**(Place after Tab 1c)**

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- Offeror shall comply with ARS §35-393.01 and certify that they are not currently engaged in and agree that for the duration of the contract to not engage in, a boycott of Israel.  
**(Note: Unless and until the District Court's injunction in *Jordahl v. Brnovich et al.*, Case No. 3:17-cv-08263 (D. Ariz.) is stayed or lifted, the Anti-Israel Boycott Provision (A.R.S. the Anti-Israel Boycott Provision (A.R.S. 35-393.01 (A)) is unenforceable and will take no action to enforce it. Compliance to this term and condition is not a mandatory part of the offer as long as the injunction remains in place. Offers will not be evaluated based on whether the offeror complied or deviated to this term and condition.)**
- If applicable to the products and services offered under this contract, Offeror shall comply with current applicable requirements of Health Insurance Portability and Accountability Act of 1996 (HIPPA), and accompanying regulations. Contract vendor agrees to work with the member in the course of performance so that the member and contract vendor are in compliance with HIPPA.

**4. CONFIDENTIAL INFORMATION**

**4.1. Confidential information request:** If offeror believes that its Statement of Qualifications contains confidential trade secrets or other proprietary data not to be disclosed, a statement advising Mohave of this fact shall accompany the Statement of Qualifications, and the information shall be so identified wherever it appears. Mohave shall review the statement and shall notify the offeror of their determination in writing whether the information shall be withheld or disclosed. Requests to deem the entire offer as confidential will not be considered.

**4.2. Public record:** All Statements of Qualifications submitted in response to this solicitation shall become the property of Mohave. They will become a matter of public record available for review, subsequent to award notification, with the exception of information deemed confidential by Mohave.

**5. CONFIRMATION**

If an apparent mistake in a Statement of Qualifications, relevant to the award determination is discovered after opening and before award, Mohave shall contact the offeror for written confirmation of the Statement of Qualifications. If offeror fails to act, the offeror shall be considered non-responsive.

Mohave may contact an offeror to confirm our understanding of the Statement of Qualifications. Such contact shall be prior to award. Mohave shall obtain written confirmation from the offeror and shall retain the confirmation in the procurement file. Correction of mistakes in a Statement of Qualifications shall only be allowed as described in Arizona procurement rules and code.

**6. CONSTRUCTION**

**6.1. Construction services:** Construction, and one or more related services, such as maintenance services, operations services, design services and preconstruction services are services authorized in the definition of JOC.

**6.2. Subcontractor:** A person who contracts to perform work or render service to a contractor or to another subcontractor as a part of a contract with Mohave.

**7. CONTRACT MANAGEMENT**

**7.1. Applicable law:** The contract shall be governed by the laws of the State of Arizona, and suits pertaining to the contract may be brought only in courts in the State of Arizona.

**7.2. Application of law:** The Arizona Procurement Code, the Arizona State Board of Education School District Procurement Rules, and the Uniform Commercial Code (UCC) as adopted by the State of Arizona, are part of this document as if fully set forth herein. Any provision or clause required by law, rule or regulation to be included in the contract will be read and enforced as if in the contract.

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**General Terms and Conditions**  
**(Place after Tab 1c)**

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**7.3. Contract claims or controversies:** The requirements of the Arizona procurement rules and code shall govern any contract awarded as a result of the subsequent RFP, as well as any subsequent RFP claims or controversies associated with it. Formal contract claims and controversies between a member and contract vendor shall be resolved in accordance with R7-2-1155 through R7-2-1159, or ARS, Title 41, Chapter 23, Article 9, as applicable. The member's authorized representative shall serve as the district representative for resolution of such claims and controversies. ARS, Title 41, Chapter 23, Article 9 and the rules promulgated under it, or R7-2-1155 through R7-2-1159, as applicable, provide the exclusive procedure for asserting a cause against the member under the contract.

**7.4. Severability:** The provisions of any subsequent contract are severable to the extent that any provision or application held to be invalid shall not affect any other provision or application of the contract which may remain in effect without the invalid provision or application.

**8. COOPERATIVE PURCHASING**

**8.1. Cooperative purchasing:** Any subsequent awarded contract is based on the need for Mohave to provide the economic benefits of volume purchasing and reduction in administrative costs through cooperative purchasing to members. Any offer that prohibits sales to specific types of members (e.g., state agencies or local government units) may not be considered. Sales without restriction to any members are preferred.

**8.2. Cooperative purchasing agreements:** Cooperative Purchasing Agreements between Mohave and its members have been established under Arizona procurement rules and code for use of contracts.

**8.3. Eligible agencies:** Any subsequent contract awarded from this solicitation process shall be available to all members. Members shall have a current signed Mohave Cooperative Purchase Agreement. Member is defined as a local or public procurement unit, or a governmental public entity that is a political subdivision for purposes of federal income tax, or a nonprofit educational or public health institution that is a political subdivision for purposes of federal income tax or meets the requirements of Section 115 of the Internal Revenue Code. Mohave has over 450 members including public school districts, community colleges, city and county governments and political subdivisions throughout Arizona. A list of members may be found on Mohave's website, [www.mesc.org](http://www.mesc.org). Actual use of any contract shall be at the sole discretion of Mohave's members.

**8.4. Most favored customer relationship:** Nothing in this solicitation is intended to establish a most favored customer relationship between Mohave and contract vendor. Contract vendor may respond to any solicitation without regard to this contract. Offeror agrees all prices, terms, warranties, and benefits granted by offeror to members through any subsequent awarded contract are comparable to or better than the equivalent terms offered by offeror to any present customer meeting the same qualifications or requirements. If contract vendor offers lower prices to any of its other customers, it may lower its prices to Mohave at the same time by written notice.

**9. EVALUATION and AWARD**

**9.1. Basis of award:** In accordance with Arizona Administrative Code, Article 11: School District Procurement R7-2-1111(C), ARS §34-604(F)(2) and §41-2579(F)(2), Mohave shall issue a Request for Proposal to a final list of responsive and responsible vendors determined to be most qualified to perform the specified construction services. To qualify for evaluation, a Statement of Qualifications must have been submitted on time, and materially satisfy all mandatory requirements identified in this solicitation.

**9.2. Exceptions/deviations to requirements:** All requested exceptions/deviations must be clearly explained. Unacceptable exceptions/deviations shall remove your Statement of Qualifications from further consideration. Mohave shall be the sole judge on the acceptance of exceptions/deviations and Mohave's decision shall be final.

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## General Terms and Conditions (Place after Tab 1c)

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**9.3. Formation of contract:** No contracts shall be awarded from the Request for Qualifications.

**9.4. Interviews:** Mohave shall not hold interviews during the evaluation of this Request for Qualifications.

**9.5. Maximum JOC order:** The maximum dollar amount of an individual JOC order shall be one million dollars or such higher or lower amount prescribed by the purchasing agency in an action noticed pursuant to ARS, Title 38, Chapter 3, Article 3.1 or a rule adopted by the purchasing agency as the maximum amount of an individual JOC order. Requirements shall not be artificially divided or fragmented in order to constitute a JOC order that satisfies this requirement.

**9.6. Method of evaluation:** Mohave shall select a committee of not more than seven (7) members to evaluate the Statements of Qualifications. Composition of the committee shall be in compliance with Arizona Administrative Code, Article 11: School District Procurement R7-2-1107, ARS §34-604(C)(3) and §41-2579(C)(3).

**9.7. Multiple award:** To assure that our contracts meet the requirements of all members, Mohave may award up to five contracts to individual firms receiving the highest number of points, for similar job-order-contracting construction services within a specialty division (e.g. Division 23 HVAC) or within all divisions. Each of the multiple contracts will be awarded to a separate person/firm. Offeror should consider this fact in preparing their response. The decision to award multiple contracts, award a single contract, or make no award rests solely with Mohave. A multiple award shall be made only if the procurement officer determines in writing that a multiple award is necessary and is advantageous to Mohave members.

A multiple award shall be limited to the least number of contracts necessary to meet the requirements of the using agencies. Mohave shall make the sole determination of the least number of contracts required to meet the need. Mohave's basis for determining whether to award multiple contracts shall be based upon considerations for the large number of members, diverse types of members, location of members throughout Arizona and members' past usage of similar contracts.

Criteria for selecting vendors for multiple contracts shall be based upon considerations for members' experience with existing products and systems, brand continuity for parts replacement and future expansion, contract vendor's ability to provide for our large, diverse membership, Mohave's past experience with contracts for similar product/services, and/or other relevant criteria.

**9.8. Past performance information:** Past Performance Information (PPI) is relevant information regarding a contract vendor's actions under previously awarded contracts to public agencies. It includes contract vendor's record of performance under such contracts including, but not limited to: conformance to the terms, conditions, specifications and scope of work of the contracts, responsiveness to, and correction of, contract claims and controversies, and satisfaction of the contracting entities. PPI shall be a factor in evaluation and award.

**9.9. Request for Proposal:** The evaluation committee shall determine a final list of offerors to receive a subsequent Request for Proposal for general contracting and/or specialty contracting.

**9.10. Responsive Statement of Qualifications:** A responsive Statement of Qualifications conforms in all respects to the material requirements of the solicitation. The Statement of Qualifications shall be responsive to receive further consideration. Mohave reserves the right to waive minor informalities.

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**General Terms and Conditions**  
**(Place after Tab 1c)**

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**10. INSURANCE**

**10.1. Certificate:** Evidence of the required insurance shall be provided with your Statement of Qualifications by means of a current certificate of insurance with the coverage's as stated within the requirements below. Before any orders are processed under an awarded contract, contract vendor shall provide a certificate that names Mohave Educational Services Cooperative, Inc. as the certificate holder.

**Certificate (or certificates if using multiple carriers) shall include, at a minimum, coverage for:**

- General Liability
- Automobile liability
- Umbrella or Excess Liability
- Workers' Compensation

In addition, contract vendor must be willing to provide, upon request, identical certificate of insurance to any member using this contract. Contract vendor must also be willing, upon request, to add any member as an additional insured entity. Any costs for adding a member as an additionally insured entity shall be clearly identified in submitted contract pricing. If no pricing is identified, adding a member as an additionally insured entity shall be provided at no additional cost.

**Provide evidence of current insurance coverage after Tab 2i.**

**10.2. Deductibles:** Contract vendor shall pay the deductibles required by the insurance provided under this contract.

**10.3. Liability insurance:** Prior to commencing services under this contract, contract vendor shall procure and maintain during the life of this agreement, comprehensive general liability insurance, to include automobile liability, providing limits of an aggregate amount of not less than \$2,000,000.

**10.4. Scope of Insurance:** Contract vendor's insurance shall provide adequate protection for contract vendor against damage claims which may arise from operations under this contract, whether such operations are by the insured or by anyone directly or indirectly employed by the insured. All insurance must be written by companies incorporated within the United States (exclusive of Territories or Possessions) and licensed or authorized to do business in Arizona.

**10.5. Subcontractor insurance:** Prior to commencing any work, any subcontractor shall procure and maintain at its own expense until final acceptance of the work, insurance coverage in a form and from insurers acceptable to the prime contractor. All subcontractors will provide workers' compensation insurance, which waives all subrogation rights against the prime contractor, member and Mohave.

**10.6. Workers' compensation insurance:** Contract vendor shall also procure and maintain during the life of this agreement, workers' compensation insurance for all of contract vendor's employees engaged in work under the contract. All workers' compensation insurance will be in compliance with Arizona state statute and evidenced by a certificate of insurance.

**11. LICENSES**

A contract vendor for JOC construction services shall be licensed to perform construction pursuant to ARS, Title 32, Chapter 10. The contract vendor shall maintain in current status all federal, state and local licenses, bonds and permits required for the operation of the business conducted by contractor. The contract vendor shall remain fully informed of and in compliance with all current ordinances and regulations pertaining to the lawful provision of services under the contract. Mohave reserves the right to stop work and/or cancel the contract of any contractor whose license(s) expire, are suspended or terminated. Contract vendor shall immediately notify Mohave of any expiration, lapse, suspension or termination of license(s).

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**General Terms and Conditions**  
**(Place after Tab 1c)**

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**12. OFFEROR QUALIFICATIONS**

It is preferred that the offeror has extensive knowledge and at least three (3) years experience with the provision, installation and maintenance of the equipment, and job order contracting services offered. Mohave reserves the right to accept or reject newly-formed companies based solely on information provided in the subsequent proposal and/or its own investigation of the company.

**13. PREPARATION OF THE STATEMENT OF QUALIFICATIONS and STATEMENT OF QUALIFICATIONS FORMAT**

**13.1. Modification of Statement of Qualifications:** An offeror may modify a Statement of Qualifications in writing at any time before Request for Qualifications opening if the modification is received before the Request for Qualifications due date and time at the location designated in the Request for Qualifications for receipt of Statement of Qualifications.

**13.2. Compliance with instructions:** Offeror's ability to follow Statement of Qualifications preparation instructions in this solicitation will be considered an indicator of offeror's ability to follow instructions should it receive an award as a result of the subsequent RFP. The quality of organization and writing reflected in the Statement of Qualifications will be considered to be an indication of the quality of organization and writing which would be prevalent for any contract that may be awarded. As a result, the Statement of Qualifications will be evaluated as a sample of data submission. Subjective judgment on the part of Mohave's evaluators is implicit in this process.

**13.3. Cost of Statement of Qualifications preparation:** Mohave will not reimburse the cost of developing, presenting, or providing any response to this solicitation.

**13.4. Offeror responsibility:** Offeror shall examine the entire solicitation, seek clarification of any item or requirement that may not be clear, and check all responses for accuracy before submitting Statements of Qualifications. Failure to examine any requirements shall be at offeror's risk. Negligence in preparing an offer confers no right of withdrawal after due date and time.

**13.5. Statement of Qualifications forms:** The forms and format contained in the solicitation shall be used. Offerors may reproduce the forms and retype the information, but all of the required information must be presented in the tab order requested. Electronic or faxed Statements of Qualifications shall not be considered.

**14. PRICING**

**14.1. Basis for pricing:** Contract pricing under the subsequent request for proposal awards shall be based upon: Coefficient applied to a UPB; and/or Open Book pricing; and/or discount applied to Trade Service price guide.

**14.2. Pricing requirements:** Pricing is not requested in the Request for Qualifications and shall not be included in your response.

**15. PROSPECTIVE BIDDERS REGISTRATION**

Any offeror submitting a perfunctory Statement of Qualifications with no serious intent of being accepted may be removed from Mohave's prospective bidders list. Any vendor not responding to two (2) consecutive Requests for Qualifications or solicitations for similar procurements may be removed from the prospective bidders list. A "no bid" response or request to remain on the list is sufficient to keep a vendor on the Prospective Bidders Registration.

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**General Terms and Conditions**  
**(Place after Tab 1c)**

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**16. PROTESTS**

Protests shall be filed with Anita McLemore, C.P.M., the Executive Director (the District Representative), and shall be resolved in accordance with Arizona procurement rules and code, ARS, Title 41, Chapter 23, Article 9 (<https://www.azleg.gov/arstitle>) and State Board Rules R7-2-1001 through R7-2-1196 (<https://azsos.gov/rules/arizona-administrative-code>). *A protest must be in writing and must be filed with the Executive Director at 625 E. Beale Street, Kingman, Arizona, 86401.* Protests based upon alleged improprieties in a solicitation shall be filed before the due date and time for responses to the solicitation. The interested party shall file the protest within ten (10) days after Mohave makes the procurement file available for public inspection. A protest filed on the tenth day must be received by 5:00 p.m., local Arizona time. The interested party may file a written request for an extension. The written request shall be filed before the time limit specified above and shall set forth good cause as to the specific action or inaction of Mohave that resulted in the interested party being unable to file the protest before the time limit specified above.

A protest shall be in writing and shall include the following information:

- The name, address and telephone number of the interested party;
- The signature of the interested party or the interested party's representative;
- Identification of the solicitation by contract number;
- A detailed statement of the legal and factual grounds of protest including copies of any relevant documents;
- The form of relief requested.

Should Mohave prevail in an appeal of a decision issued by the Executive Director, appellant waives any objection to the hearing officer awarding Mohave its reasonable attorney's fees and costs along with the costs for the hearing.

**17. STATEMENT OF QUALIFICATIONS ACCEPTANCE PERIOD/WITHDRAWAL**

**17.1. Late Statement of Qualifications:** Except as authorized by Arizona procurement rules and code, late Statements of Qualifications shall not be considered.

**17.2. Withdrawal of Statement of Qualifications:** An offeror may withdraw a Statement of Qualifications in writing at any time before Request for Qualifications opening if the withdrawal is received before the Request for Qualifications due date and time at the location designated in the Request for Qualifications for receipt of Statement of Qualifications. After the opening time and date, Statement of Qualifications may not be withdrawn, except as allowed by Arizona procurement rules and code.

**18. STATEMENT OF QUALIFICATIONS OPENING**

Statements of qualifications shall be opened immediately following the Request for Qualifications due date and time. The name of each offeror shall be publicly read and recorded in the presence of witnesses. All information in the Statement of Qualifications shall remain confidential until after award of subsequent contracts, with the exception of review by Mohave staff and selected evaluators.

**19. SUSPENSION OR DEBARMENT STATUS**

Offeror shall include a letter in its Statement of Qualifications notifying Mohave of any debarment, suspension or other lawful action taken by any federal, state or local government within the last five years that precludes offeror or its employees from participating in any public procurement activity. Such letter shall provide name and address of the public procurement unit, effective date, duration, and relevant circumstances of the suspension or debarment. Failure to supply such letter or not disclose all pertinent information shall result in cancellation of any subsequent contract. **Letter shall be placed after Tab 1a.**

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**General Terms and Conditions**  
**(Place after Tab 1c)**

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**20. TERM OF CONTRACT AND EXTENSION**

**20.1. Contract period:** It is Mohave's intent to award a multi-term contract for the specified product, material, process, or services from the subsequent Request for Proposal awards. The initial contract term shall be for one (1) calendar year from the effective date of contract award. By mutual written agreement between Mohave and contract vendor, the contract may be extended for up to four (4) consecutive additional 12-month periods, beginning immediately after expiration of the prior term. However, no contract extension (contract modification) exists unless and until contract vendor is so notified by Mohave.

**20.2. Contract extension (contract modification):** Conditions for contract extension (contract modification) may include, but are not limited to: contract usage, satisfactory performance of services during the preceding contract term, ability to continue to provide satisfactory services, continued adherence to the contract requirements, and continued competitive prices for the materials and services provided under the contract. Mohave shall prepare a performance report for all contracts prior to issuing any extension (contract modification). This performance report shall use past performance information gathered by your assigned Contract Specialist. Past performance information shall be used when determining whether a contract receives an extension (contract modification).

**21. TIME (DEFINITION OF)**

Periods of time, stated as a number of days, shall be in calendar days, not business days.

**General Terms and Conditions Acceptance Form**  
**(Place after Tab 1c)**

*Signature on Page 2 certifies complete acceptance of the General Terms and Conditions in this solicitation, except as noted below (additional pages may be attached, if necessary).*

**Check one of the following responses to the General Terms and Conditions:**

- We take no exceptions/deviations to the general terms and conditions.**

*(Note: If nothing is listed below, it is understood that no exceptions/deviations are taken.)*

- We take the following exceptions/deviations to the General Terms and Conditions. All exceptions/deviations shall be clearly explained. Reference the corresponding General Terms and Conditions that you are taking exceptions/deviations to. Clearly state if you are adding additional terms and conditions to the General Terms and Conditions. Provide details on your exceptions/deviations below:**

*(Note: All requested exceptions/deviations must be clearly explained. Reference the specific terms and conditions that you are taking exceptions/deviations to, detail any proposed substitute terms and conditions, and clearly explain how the exceptions/deviations meet or exceed the requirements. Unacceptable exceptions/deviations shall remove your Statement of Qualifications from consideration for award. Mohave shall be the sole judge on the acceptance of exceptions/deviations and Mohave's decision shall be final.)*

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**Statement of Qualifications Submittal**  
**(Place after Tab 2)**

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**Statement of Qualifications (Prepare a Statement of Qualifications as outlined below):**

- a. Table of Contents**
- Provide a table of contents for your Statement of Qualifications.
  - Place each major section after an indexed tab (e.g. 2a, 2b) and dividers.
- b. Letter of Introduction**
- Provide a brief introduction of your firm and its interest in this procurement.
- c. Basic Company Information**
- Company Name
  - Address
  - Telephone Number
  - Fax Number
  - Name of Primary Contact
  - Email Address of Primary Contact
  - Number of Years in Business
  - License(s) held by the firm: License(s) shall include the current Arizona Contractors license number applicable to perform the scope of work. A copy of your current license shall be included in your response.
  - If the firm has more than one office, provide specific information about the parent company and administering office, and other branch offices.
- d. General Contracting and/or Specialty Contracting**
- Indicate whether your firm is submitting a Statement of Qualifications for general or specialty contracting.
  - If your firm is submitting as a specialty contractor, include a list of the divisions, (as defined by the Construction Specifications Institute), for the work you will perform.
    - *If your firm is submitting as a specialty contractor and does not hold a contractor's license for that specialty, explain in detail how you will perform the services requiring these licenses.*
- e. Form of Ownership**
- Indicate the type of ownership (corporation, joint venture, limited liability company, sole proprietorship, etc.)
  - If responding as a joint venture with fewer than two relevant projects, submit qualifications for each firm.
- f. Company Personnel**
- Provide information about the firm's personnel resources (average size of workforce, position classifications, experience, training, location(s) of personnel).
  - Include information about support staff (e.g., office workers, project administrators).
  - Provide detailed information describing education, training and qualifications for key personnel (e.g., general management, project management, estimator, engineer, construction superintendent, FAA project experience and training).
  - Describe your plan for personnel recruitment.
  - Provide an organization chart for your firm.
  - Complete and enclose a Standard Form 330, to the extent applicable to your firm. Notes on Standard Form 330 as follows:

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## Statement of Qualifications Submittal (Place after Tab 2)

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### **GENERAL SERVICES ADMINISTRATION STANDARD FORM 330:**

While the title of this form is "Architect-Engineer Qualifications", the intent is to have the firm responding to this Request for Qualifications fill out the form. We are not looking for you to obtain the services of an architect and/or engineering firm to fill out this form. The form is to be used to review your qualifications, as applicable under our Request for Qualifications.

Pages 1 - 8 of Standard Form 330 are instructions to assist you in filling out the form. Standard Form 330 Pages 1 - 5 (marked as Part I – Contract - Specific Qualifications) should be filled out and returned with your Statement of Qualifications. Page 6 of Standard Form 330 (marked as Part II - General Qualifications) will only need to be used if you have more than one branch office that would be seeking work under an awarded contract.

Section C "Proposed Team" (page 1 of Instructions) asks for information about your key subcontractors. You may skip this portion of the form, as this information is required in section g, "Consultants and Subcontractors", below.

**g. Consultants and Subcontractors**

- Provide the names and locations of consultants and subcontractors you plan to use, if any.
- List or describe the services to be provided by each.
- Provide a statement of your subcontractors' experience providing the services, particularly in a JOC setting.

**h. Financial Information**

- Provide a current letter from your financial institution indicating the range of credit available to your firm, (e.g. "credit in the low nine figures" or "credit line exceeding five figures"), or your firm's latest annual financial report.
- Provide a current letter from your financial institution and/or officers of major suppliers, indicating confidence in your firm's stability and payment history.
- Current audited annual financial reports in lieu of letters from financial institutions may be submitted. However, the annual financial reports must provide essentially the same information as requested from the letters. Offerors are encouraged to highlight the requested information in any audit annual financial report submitted in response to this Request for Qualifications.
- All financial information will be kept confidential. These letters will only be used to evaluate qualifications and will not be made available to the public.
- Provide a letter from your bonding company indicating the ability to bond JOC orders under the contract, and your current bonding capacity.
- Provide any judgments or liens against your firm within the last three years.
- Provide any current unresolved bond claims against your firm.
- Provide any filing under the United States Bankruptcy Code, assignments for the benefit of creditors, or other measures taken for protection against creditors during the last three years.

**i. Insurance**

- Provide a certificate of insurance indicating that your firm possesses the required insurance coverage as specified in the General Terms and Conditions. The Acord 25 form is the preferred certificate, but not the required form of certificate.
- A sample certificate may be provided. However, before any orders are processed the successful contractor under the sequential awarded Request for Proposal shall provide a certificate that names Mohave as a certificate holder.

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**Statement of Qualifications Submittal**  
**(Place after Tab 2)**

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**j. Past Performance**

- Provide a statement of your experience providing general contracting or specialty contracting, particularly in a JOC setting. Indicate if you were the primary or subcontractor for the project.
- Provide a list of your JOC contracts, if any. Include date of contract, contracting agency, agency contact information, and value of contract for each contract in the list.
- If your firm has no JOC experience, provide a description of your understanding and experience partnering as a member of a team consisting of the owner, owner's customers and clients, design team, and the contractor. Provide other relative JOC experience.
- Describe your experience in pricing projects using a UPB and a coefficient, an Open Book pricing methodology, and/or Trade Service.
- If your firm has no experience pricing projects using a UPB, Open Book, and/or Trade Service, provide a description of your understanding on pricing projects using a UPB, Open Book pricing methodology, and/or Trade Service.
- Provide a description of your experience working on school district or governmental projects, working on multiple projects simultaneously, and working throughout the state. Include any specialized projects, such as airports, that require proven experience, training, knowledge, and/or certifications.
- Provide a statement of your history for submitting claims and change orders. Provide specific information (e.g. type of claim, date, reason, amount, and outcome).
- Provide any deficiency orders issued against your firm by the Arizona Registrar of Contractors within the last three years.

**k. Contract Management Plan**

- Provide a statement of your plan for performing and managing the work.
- What personnel will be used?
- Does your firm currently use RS Means Online, CostWorks CDs, 4Clicks, Trade Service, or any other estimating software based on UPBs? If not, how will you prepare JOC cost quotations and invoices?
- How do you plan to ensure prompt responses to JOC requests?
- What is your plan for responding to and performing multiple JOC orders at the same time?
- What limitations will you have geographically or in the number of simultaneous JOC orders?
- Provide other pertinent information that will help Mohave evaluate your firm and its capabilities.

**l. Quality Management Plan**

- How do you set goals and monitor the performance of your company?
- How do you inspect the work to ensure quality?
- How do you stay on schedule?
- What is your complaint and dispute resolution procedure?
- Provide other pertinent information that will help Mohave evaluate your firm and its capabilities.

**m. Subcontractor Management Plan**

- Provide a statement of your plan for managing subcontractors.
- Provide a statement acknowledging your intent to not use price as the sole determining factor when selecting subcontractors under any awarded contract.
- How will you recruit subcontractors, particularly in the local communities where work will be performed?
- For subcontractors performing specialized work, such as airports, include information as to how you will ensure subcontractor has the experience, training, knowledge, and/or certifications required to perform the work.

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**Statement of Qualifications Submittal**  
**(Place after Tab 2)**

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- How will you ensure acceptable quality for work performed by subcontractors?
- How will you address controversies and claims related to work performed by subcontractors?
- Provide other pertinent information that will help Mohave evaluate your subcontractor management capabilities.
- For firms who self-perform and do not subcontract work, provide your confirmation that any future subcontracts shall follow the requirements specified in the subcontractor management plan as outlined above. Mohave may request a copy of your plan prior to allowing subcontracting under an awarded contract.

**n. Safety**

- Provide a copy of your firm's safety management plan.
- Provide a copy of your firm's safety training program.
- Provide a letter from your firm's insurance company stating the Workers' Compensation Experience Modification Rate (EMR) for the past three (3) years. The letter shall be on the insurance company's letterhead and shall be signed by an appropriate individual employed by the insurance company.



# Request for Proposal 19F-0808 Job Order Contracting for Various Construction Trades

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## **REQUEST FOR PROPOSAL 19F-0808**

### **Job Order Contracting for Various Construction Trades**

Pursuant to the provisions in the Arizona procurement rules and code, Mohave Educational Services Cooperative, Inc. seeks proposals to establish contract(s) for Job Order Contracting for General Contracting, Plumbing, Electrical and Heating, Ventilation and Air Conditioning Services. A copy of this RFP is available for public inspection at 625 East Beale Street, Kingman, AZ 86401.

**Due Date and Time: Thursday, August 8, 2019 at 3:00 p.m. (local Arizona time)**

**Last Day For Questions: Thursday, August 1, 2019 at 5:00 p.m. (local Arizona time)**

**RFP Questions Must Be Directed To:** Michael Nentwig, CPPB, Contract Specialist I  
Email: [contracts@mesc.org](mailto:contracts@mesc.org)  
Telephone: (928) 718-3203

**To be considered, proposals shall be delivered to Mohave Educational Services Cooperative, Inc. (Attn: Contracts Dept.), 625 East Beale Street, Kingman, AZ 86401** in a sealed envelope or package with RFP 19F-0808, offeror's name, mailing address, proposal due date and time clearly indicated on the envelope or package. Proposals must be in the actual possession of Mohave on, or prior to, the exact time and date indicated above. Proposals shall be opened immediately following the proposal due date and time, with the name of each offeror publicly read and recorded. Late proposals shall not be considered. Kingman is considered a "rural" area by many express delivery carriers and thus, they do not guarantee priority (next day) delivery by a specific time. Prospective offerors are encouraged to keep this in mind when arranging delivery of their proposals and are advised herein that late proposals shall be handled as specified by Arizona procurement rules and code.

Offerors are strongly encouraged to carefully read the entire contents of this solicitation prior to submitting a proposal. Failure to examine any of the requirements will be at the offeror's risk.

Mohave reserves the right to cancel this solicitation and/or reject all proposals in whole, or in part, if Mohave determines that cancellation and/or rejection is advantageous to Mohave and/or its members.

A handwritten signature in black ink that reads 'Anita S. McLemore'.

**Anita S. McLemore, C.P.M.  
Executive Director  
Mohave Educational Services Cooperative, Inc.**

**Publish Date: July 8, 2019**

Template Rev. 19-3

**Technical Proposal – Offer and Acceptance Form**  
**(Place after Tab 1a)**

**RFP 19F-0808**  
**Job Order Contracting for Various Construction Trades**

***To Mohave Educational Services Cooperative, Inc.:***

The undersigned hereby certifies understanding and compliance with the requirements in all terms, conditions, specifications and amendments. Offeror further agrees to furnish materials and/or services in compliance with all terms, conditions, specifications and amendments in the solicitation and any written exceptions in the offer.

Federal Employer Identification Number \_\_\_\_\_

Company Name \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone Number \_\_\_\_\_

The *Offer and Acceptance Form* should be submitted with a signature of the person authorized to sign the proposal. The person signing the proposal shall initial erasures, interlineations, or other modifications in proposal. Failure to sign the *Offer and Acceptance Form*, or to make other notations as indicated, may result in rejection of proposal.

**Authorized Signature** \_\_\_\_\_

Printed Name \_\_\_\_\_ Title \_\_\_\_\_

Primary Email \_\_\_\_\_ Alternate email \_\_\_\_\_

*Note: The primary email address will be used for all communication from Mohave regarding your response to this solicitation. Provide an alternate email address that will be used **only** if the primary email address is not valid.*

**The contract vendor shall not commence any billable work or provide any material or service under this contract unless and until contract vendor receives a purchase order with Mohave's review noted.**

**Acceptance of Offer and Contract Award (Mohave Only)**

***Your Proposal is Hereby Accepted:***

As an awarded contract vendor, you are now bound to sell the materials and/or services offered to and accepted by Mohave in accordance with the solicitation, including all terms, conditions, specifications, amendments and any accepted written exceptions.

This contract shall be referred to as Contract Number \_\_\_\_\_

Awarded this \_\_\_\_\_ day of \_\_\_\_\_ 2019.

This contract shall be effective the \_\_\_\_\_ day of \_\_\_\_\_ 2019.

\_\_\_\_\_  
Anita S. McLemore, C.P.M., Executive Director  
Mohave Educational Services Cooperative, Inc.

**Technical Proposal – Confidential/Proprietary Submittal Form**  
**(Place after Tab 1a)**

**CONFIDENTIAL/PROPRIETARY SUBMITTALS**

Confidential/Proprietary Submittals (mark one):

\_\_\_\_\_ No confidential/proprietary materials have been included with this offer.

\_\_\_\_\_ Confidential/proprietary materials have been included with this offer. Offerors shall identify below any portion of their offer deemed confidential or proprietary (see General Terms and Conditions 6. Confidential Information).

*Note that any documentation marked as confidential or proprietary must be identified below. Any confidential or proprietary information NOT identified as instructed shall be deemed as non-confidential or non-proprietary.*

The confidential/proprietary information identified below does not guarantee that disclosure will be prevented but that the item(s) will be subject to review by the offeror and Mohave prior to any public disclosure. Requests to deem the entire offer or pricing as confidential shall not be considered.

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Firm

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Authorized Signature

**Technical Proposal – Instructions to Offeror and Checklist Form**  
**(Place after Tab 5a)**

From evaluation of responses to RFQ 19F-0605 and in accordance with Arizona Administrative Code, Article 11: School District Procurement R7-2-1111(C), ARS §34-604 (F)(2) and §41-2579(F)(2), your firm has received this Request for Proposal. **Review this document in its entirety to make sure you fully understand the products and services that we are requesting.** Please do not assume a particular form, section, specification or requirement does not, or should not, apply to you. Contact Mohave at [contracts@mesc.org](mailto:contracts@mesc.org) with questions.

We have included this checklist to assist you in preparing your response. Follow each step, placing the required information in your response binder in the proper place. **All of the items listed below are required.** Initial next to each item to indicate completion.

\_\_\_\_\_ **Step ONE:** Read and understand the document. Your firm is responsible for asking any questions regarding the information you are required to include with your response. Do not hesitate to contact the Contract Specialist as shown on page 1 for clarification on any items contained in this solicitation.

\_\_\_\_\_ **Step TWO:** One (1) original and four (4) additional complete copies of your technical proposal shall be submitted in separate three-ring loose-leaf binders in the format detailed below. The technical proposal shall contain all specifications, and any other information required by the solicitation.

All proposals must be completed in ink, on a computer, or typewritten. No pencil submissions are allowed. Forms may be filled out by hand but shall be legible.

\_\_\_\_\_ **Step THREE:** The technical proposal shall be organized and presented in the order as required below, with separate tabs and sub-tabs (e.g. 1a, 1b) and dividers.

\_\_\_\_\_ **Step FIVE:** Confirm that the proposal is complete and signed on page 2 by an authorized representative.

\_\_\_\_\_ **Step SIX:** Keep a complete copy of your proposal for your records.

\_\_\_\_\_ **Step SEVEN:** Proposal shall be submitted to the proper location in a sealed and properly identified envelope or package, as specified on page 1 of this solicitation. Proposals must be in the actual possession of Mohave on, or prior to, the exact time and date set for proposal opening.

**\_\_\_\_\_ Tab and Sub-tab Arrangement: \_\_\_\_\_**

• **Tab 1: Offer and Acceptance, Terms and Conditions, Scope of Work and Specifications Documents, Anti-Lobbying Certificate, USDA Form AD-1048**

\_\_\_\_\_ **Tab 1a** – The signed *Offer and Acceptance Form* is placed after Tab 1a.

\_\_\_\_\_ A copy of suspension or debarment letter (if applicable) is placed after Tab 1a.

\_\_\_\_\_ A copy of the *Confidential/Proprietary Submittal Form* is placed after Tab 1a.

\_\_\_\_\_ **Tab 1b** – Signed amendments, if any, are placed after Tab 1b.

\_\_\_\_\_ **Tab 1c** – A complete copy of the General Terms and Conditions and Standard Terms and Conditions for Construction is placed after Tab 1c. *(Note: Unless and until the District Court's injunction in Jordahl v. Brnovich et al., is lifted or stayed, the Anti-Israel Boycott Provision (A.R.S. §35-393.01 (A)) is unenforceable and Mohave will take no action to enforce it.)*

\_\_\_\_\_ A completed copy of the *General Terms and Conditions and Standard Terms and Conditions for Construction Acceptance Form* is placed after Tab 1c. Any exceptions to the General Terms and Conditions and Standard Terms and Conditions for Construction are noted and explained.

\_\_\_\_\_ **Tab 1d** – A complete copy of the Special Terms and Conditions is placed after Tab 1d.

\_\_\_\_\_ A completed copy of the *Special Terms and Conditions Acceptance Form* is placed after Tab 1d. Any exceptions to the Special Terms and Conditions are noted and explained.

\_\_\_\_\_ **Tab 1e** – A complete copy of the Scope of Work is placed after Tab 1e.

**Technical Proposal – Instructions to Offeror and Checklist Form**  
**(Place after Tab 5a)**

\_\_\_\_\_ A complete copy of the Specifications with compliance, deviation, or no bid noted for each item is placed after Tab 1e.

\_\_\_\_\_ A completed copy of the *Scope of Work and Specifications Acceptance Form* is placed after Tab 1e. Any exceptions to the Scope of Work and Specifications are noted and explained.

\_\_\_\_\_ **Tab 1f** – The original bid bond/alternate bid security (as detailed in the Special Terms and Conditions) in the amount of \$100,000 is placed after Tab 1f.

\_\_\_\_\_ Your current single job and aggregate bonding capacity information (**see Special Terms and Conditions 1.2 Bonding Capacity**) as required is placed after Tab 1f.

\_\_\_\_\_ **Tab 1g** – A completed copy of the *Anti-Lobbying Certificate Form* is placed after Tab 1g.

\_\_\_\_\_ A copy of OMB standard form LLL, *Disclosure of Lobbying Activities* (if applicable) is placed after Tab 1g.

\_\_\_\_\_ **Tab 1h** – A completed copy of *U.S. Department of Agriculture Form AD-1048* is placed after Tab 1h.

\_\_\_\_\_ Explanation from any prospective lower tier participant that is unable to certify to any of the statements in the certification is placed after (in Tab 1h).

***Failure to complete and submit the Anti-Lobbying Certificate (Tab 1g) and USDA Form AD-1048 (Tab 1h) shall render your proposal nonresponsive.***

- **Tab 2: Primary Vendor Information**

\_\_\_\_\_ **Tab 2a** – A complete response to the Method of Approach pages is placed after Tab 2a.

\_\_\_\_\_ **Tab 2b** – A complete response to the Qualification and Experience pages is placed after Tab 2b.

\_\_\_\_\_ Evidence of current Arizona contractor's license(s) is placed after Tab 2b.

\_\_\_\_\_ **Tab 2c** – A completed Past Performance and Management Plans are placed after Tab 2c.

\_\_\_\_\_ **Tab 2d** – A current certificate or certificates of insurance (**see Special Terms and Conditions 5.1 Insurance**) is placed after Tab 2d.

\_\_\_\_\_ **Tab 2e** – Financial information (statement from financial institution or letter of credit) is placed after Tab 2e.

- **Tab 3: (Reserved for Price Proposals after contract award)**

- **Tab 4: Supporting Contract Documents**

\_\_\_\_\_ **Tab 4a** – Completed Firm Information, Order Processing, Individual Contact Information, and Customer Support Information for warranty and maintenance services is placed after Tab 4a.

\_\_\_\_\_ **Tab 4b** – Sample Supplemental or End-User Agreement(s) (if applicable) are placed after Tab 4b.

\_\_\_\_\_ **Tab 4c** – Extended warranty or maintenance service plan information (if applicable) is placed after Tab 4c.

- **Tab 5: Additional Information**

\_\_\_\_\_ **Tab 5a** – Completed *Instructions to Offeror and Checklist Form* is placed after Tab 5a.

\_\_\_\_\_ **Tab 5b** – Descriptive literature, slicks and any other supporting printed data are placed after Tab 5b.

- **Tab 6: (Reserved for your Request for Qualifications response after contract award)**

**Technical Proposal – Instructions to Offeror and Checklist Form**  
**(Place after Tab 5a)**

**Step FOUR:** Submit one (1) copy of your Price Proposal. Price proposal shall be completed and submitted as indicated below:

**Price proposal shall be submitted in a clearly marked, separate sealed envelope. Your sealed price proposal shall be included with your sealed response to RFP 19F-0808.**

A paper copy of your price proposal **shall** be included in your separate sealed envelope or package. Electronic copies of the entire price proposal, your price schedules, and any additional requested price information **shall** be included in your separate sealed envelope or package. Two electronic copies **shall** be provided on separate CD, DVD or USB devices. **All price proposal information shall be submitted in a clearly marked, separate sealed envelope.**

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**Technical Proposal - Scope of Work**  
**(Place after Tab 1e)**

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**1. DESCRIPTION**

In order to gain economies of scale, Mohave is formally soliciting sources for Job Order Contracting construction services for General Contracting, Plumbing, Electrical and Heat, Ventilation and Air Conditioning as specified within this Request for Proposal. These services are requested for Mohave's statewide membership of approximately 450 public agencies. However, other members may be added during the term of an awarded contract(s). A current list of all members can be found on Mohave's website at [www.mesc.org](http://www.mesc.org). Contracts, in whole or in part, shall be awarded to offeror, or offerors, for an initial one (1) year term and four (4) potential one-year extensions (contract modification).

Because any work under this contract will be on a Job Order basis, exact project details are not available. Information on the project site, scope of work, schedule, project design and construction budget, or life cycle budget information shall be provided by members prior to usage of awarded contracts.

Mohave may procure, as an entity for its membership, construction and construction services, as applicable, using the following project delivery method: Job Order Contracting, as stated in Arizona Administrative Code 7 - Article 11, Arizona Revised Statute § 34 and Arizona Revised Statute § 41.

Job Order Contracting services in this Request for Proposal may include, but not be limited to: general contracting services for construction, installation, repair, and upgrades. Specialty projects such as, plumbing, electrical and heating, ventilation and air conditioning are requested.

Under Job Order Contracting (JOC), a master contract is established with standard specifications and pricing based upon a coefficient that is applied to a Unit Price Book (UPB). Pricing may also be established through an Open Book Pricing methodology. Open Book Pricing allows the contract vendor to apply a predetermined General and Administrative (G&A) percentage and profit mark-up to subcontractor price quotes or total direct project costs. *Trade Service* along with an established labor hourly rate may be used for service and repair projects. When a specific project or job order is issued, the member and the contractor agree on the scope of work, pricing methodology to be used, and the cost is determined by applying the agreed upon pricing methodology for the entire project.

Mohave has current contracts for related work (e.g., plumbing, electrical and heating, ventilation and air conditioning). Any contract(s) awarded under this RFP are in addition to but will not replace these contracts. The Mohave member shall retain the right to determine which contracts are in their best interests.

Each firm may only respond to the division or divisions authorized by Mohave in your 19F-0605 notification of advancement letter.

**General Contractors Divisions 1-49:** Construction services for contract vendors in the Request for Proposal may include, but not be limited to: installation, repair, and upgrades for facilities and sites for a wide variety of educational, governmental and not for profit agencies.

**Plumbing Division 22:** Construction services in the Request for Proposals may include, but not be limited to: installation, repair, and upgrades of plumbing equipment.

**Heating, Ventilation and Air Conditioning Division 23:** Construction services in the Request for Proposals may include, but not be limited to: installation, repair, and upgrades of heating, ventilation and air conditioning equipment.

**Electrical Division 26:** Construction services in the Request for Proposals may include, but not be limited to: installation, repair, and upgrades of electrical equipment.

**Technical Proposal - Scope of Work**  
**(Place after Tab 1e)**

If a contract vendor is eligible to respond to multiple divisions, only one response shall be submitted for this RFP. However, the contract vendor shall provide information relating to each division, combined or separate for the following: specifications, qualifications in the technical proposal, pricing co-efficient and pricing information.

Mohave currently has two JOC contracts (14G-0808) for general contracting. Activity under the contracts from 9/3/14 including year to date activity is \$13,290,710.

Mohave currently has one JOC contract (14G-0808) for Division 23. Activity under the contracts from 9/3/14 including year to date activity is \$87,796,050.

Mohave currently has one non-JOC contract (14T-1205) for plumbing services. Activity under the contracts from 1/15/15 including year to date activity is \$1,127,440.

Mohave currently has one non-JOC contract (18P-0130) for electrical services. Activity under the contracts from 2/13/19 including year to date activity is \$0. Pervious contracts (13V-0124) activity from 3/7/14 to 3/7/19 was \$1,376,101.

**2. ESTIMATED TIMELINE OF EVENTS**

Mohave has developed the following estimated timeline of events related to this formal solicitation. All dates are subject to change as required and at the sole discretion of Mohave.

<b>EVENT</b>	<b>ESTIMATED DATE</b>
Request for Proposals Issued	July 8, 2019
Deadline for Questions	August 1, 2019 at 5:00 p.m. (local AZ time)
RFP Due Date and Time	August 8, 2019 at 3:00 p.m. (local AZ time) 625 East Beale Street, Kingman, AZ 86401
Public Opening of Proposals	August 8, 2019 at 3:00 p.m. (local AZ time)
Notice of Intent to Award ( <i>estimated date only</i> )	September 1, 2019 NOTE: Notification will be sent by email to all awardee(s) and non awardee(s) on or before this date.
Execution of Contract(s) ( <i>estimated date only</i> )	September 4, 2019

**3. SUBMISSION OF PROPOSALS**

- 3.1.** Proposals should provide straightforward, concise information that satisfies the requirements. Expensive bindings and/or color displays are not necessary. Emphasis should be placed on conformity to the specifications and terms and conditions, as well as the completeness and clarity of the submittal content.
- 3.2.** The offeror must submit a proposal following information detailed in the *Instructions to Offeror and Checklist Form*.
- 3.3.** A proposal submitted in response to this solicitation shall be valid and irrevocable for one hundred twenty (120) days after specified due date and time.

**Technical Proposal - Scope of Work**  
**(Place after Tab 1e)**

**4. CONTRACT TYPE**

The term contract shall be a coefficient applied to a Unit Price Book (UPB), methodology as outlined in Open Book Pricing, and/or time for labor and/or a discount applied to *Trade Service* for products.

**5. AWARD CRITERIA**

The weighted award criteria for this solicitation are as follows:

**Award(s) shall be made to the responsive and responsible offeror(s) whose proposal(s) are determined in writing to be most advantageous to Mohave for its members.**

**Responsive and responsible offeror(s) shall provide the following requirements:**

<u>Criteria</u>	<u>Points</u>
<b>Technical Proposal Evaluation</b>	
Offeror's qualifications and experience	40
Quality of the technical proposal	20
Offeror's contract management plan	10
Offeror's quality management plan	10
Offeror's subcontractor management plan	5
Offeror's safety plan and record	5
Offeror's financial capacity	5
References, past performance information and other pertinent information	5
	<b>Technical Proposal Total 100</b>
<b>Price Proposal Evaluation</b>	
Cost (Coefficients, and Open Book Rates, <i>Trade Service</i> if offered)	65
Other project costs, e.g. travel, meals and incidental expenses (M&IE), transportation costs, energy costs, ownership costs, life cycle costs	10
	<b>Price Proposal Total 75</b>
	<b>Grand Total 175</b>

**References and definitions used for specifications:**

National Electrical Contractors Association (NECA): [www.neca-neis.org](http://www.neca-neis.org)

**Technical Proposal - Specifications**  
**(Place after Tab 1e)**

**SPECIFICATIONS**

**Purpose of specifications:** Specifications are designed to enable offeror to satisfy a requirement for a product, material, process, or service. A specification may be expressed as a standard, part of a standard, or independent of a standard. No specification is intended to limit competition by eliminating items capable of satisfactorily meeting the requirements of the procurement. If offeror believes a specification is unnecessarily restrictive, offeror must notify Mohave prior to specified proposal due date and time.

**Brand names:** Brand names that appear without the trademark or service mark remain the property of their respective owners.

**Minimum specifications:** The standard of quality and performance indicated in the specifications and scope of work or services shall be understood as the minimum requirements only. Unless otherwise indicated in the specifications or drawings, all work shall be done in accordance with the specifications and recommendations of the manufacturer of the product to be installed.

**Compliance with specifications:** Offerors shall offer products, materials, processes, or services they believe come closest to meeting specifications. The fact that a manufacturer, supplier or offeror chooses not to produce or provide product, material, process, or services to meet the specifications will not be considered sufficient cause to adjudge the specifications as restrictive.

**Deviations from specifications:** Offerors will respond to each numbered specification by checking the appropriate "Comply" or "Deviate" box. "No Bid" items shall be marked as such in the appropriate "Deviate" box. Your exceptions/deviations must be clearly explained. Reference the specification that you are taking exceptions/deviations to, detail any proposed substitute language, and clearly explain how the exceptions/deviations meet or exceed specifications. Unacceptable exceptions/deviations shall remove your proposal from consideration for award. Mohave shall be the sole judge on the acceptance of exceptions and Mohave's decision shall be final. Details for exceptions/deviations shall be listed by specification number on the *Scope of Work and Specifications Acceptance Form*.

<b>Specifications</b>	<b>Comply</b>	<b>Deviate*</b>
<b>1.1 Job Order Contracting - General Specifications</b>		
1.1.01 Contract vendor shall provide all labor, materials, equipment, services and all required bonds necessary to complete each project according to the scope of work developed with the member.		
1.1.02 All work shall be accomplished in accordance with the material and equipment manufacturer's instructions. Contract vendor shall supervise all work, use qualified personnel, and require personnel to be familiar with safety procedures, equipment operation, and manufacturer's installation requirements.		
1.1.03 If contract vendor prepares drawings, the member shall approve drawings prior to contract vendor starting any work.		
1.1.04 Contract vendor's work responsibility shall include all planning, programming, administration, and management necessary to provide all services, and related construction services as applicable, as specified in the job order. Contract vendor shall perform the work in strict accordance with the contract and all current applicable federal, state and local laws, and codes.		
1.1.05 Contract vendor shall provide related services such as preparing and submitting required reports, performing administrative work, and submitting necessary information as specified under this contract and within individual job orders.		
1.1.06 Contract vendor shall ensure that all work meets or exceeds critical reliability rates or tolerances specified or included in applicable documents.		
1.1.07 Contract vendor shall ensure all work areas that may pose a hazard are adequately identified and secured at all times.		

**Technical Proposal - Specifications**  
**(Place after Tab 1e)**

1.1.08	Equipment and materials shall be produced by manufacturers and fabricators regularly engaged in the manufacture of similar items and with a history of successful production.		
1.1.09	All new materials furnished under the contract shall be of the latest design, from known manufacturers of the materials, free from defects, and in compliance with the specifications and scope of work.		
1.1.10	All materials and equipment furnished under the contract shall be of brands and models acceptable to the member.		
1.1.11	During progress of any job order that includes drawings, contract vendor shall keep a record at jobsite of all changes and corrections to the layouts shown in the drawings. Contract vendor shall enter all such changes and corrections on record drawings. Each sheet of the corrected set shall be stamped with "RECORD DRAWINGS AS-BUILT," or a similar notation.		
1.1.12	Record drawings shall include the actual location of all sub-surface utility lines and any overhead obstructions, as applicable.		
1.1.13	When requested or required by member, contract vendor shall provide reproducible, professional drafting quality drawings. The supplied drawings shall be a reproducible design with final record drawings, or drawings from which the contract vendor can develop detailed working drawings. The drawings provided shall be in accordance with current applicable federal, state and local laws and codes.		
1.1.14	The contract vendor shall promptly notify the member in writing if any discrepancies in, or omissions from, any plans, drawings, specifications, and any other document for the project are discovered. The contract vendor shall not proceed with the project without written direction from the member.		
1.1.15	Contract vendor's personnel may be permitted to use toilet facilities on the premises subject to approval from the member. In the event none are available, contract vendor shall, at the contract vendor's expense, provide portable facilities.		
1.1.16	The member may require occupying the area where work is to be performed during the construction period. Contract vendor shall coordinate with member to have access to that portion of the area within which work is to be performed.		
1.1.17	Contract vendor shall not build upon or conceal defective work.		
1.1.18	Materials classified by the member as salvageable or repairable shall remain the property of the member.		
1.1.19	Materials not classified by the member as salvageable or repairable shall be disposed of in accordance with current applicable federal, state and local laws and codes.		
1.1.20	The contract vendor shall immediately notify the member if asbestos is identified in the work area. The member will provide further instructions to the contract vendor. Removal of asbestos materials shall be accomplished by a contractor licensed in asbestos abatement, and following all current local, state and federal laws for the handling and disposal of asbestos.		
1.1.21	Contract vendor shall conduct a pre-final inspection prior to requesting a final inspection. Any discrepancies shall be corrected prior to final inspection.		

**Technical Proposal - Specifications**  
**(Place after Tab 1e)**

1.1.22	Prior to final inspection, contract vendor shall submit any available manufacturers' original operation and maintenance manuals to the member for all installed equipment and materials. Contract vendor shall conduct a training session to brief member personnel on the operation and maintenance procedures of installed equipment and materials.		
1.1.23	Prior to final inspection, contract vendor shall submit and have the member approve all submittals, as-built drawings.		
1.1.24	The member shall perform the final inspection with contract vendor. Any discrepancies will be noted and corrected within the time agreed upon with the member prior to payment.		
<b>1.2</b>	<b>Pricing – Unit Price Book Requirements (UPB)</b>		
1.2.01	Upon member acceptance of unit price book pricing (UPB) methodology to be used under the job order, project pricing shall be based upon a coefficient to be applied to an approved UPB.		
1.2.02	<b>Scope of work within Divisions 1-49 of the Construction Specifications Institute:</b> The UPB for contract vendors providing work in Divisions 1-49 shall be the current edition of RS Means Online or Costworks CDs using the Facilities Construction Cost Data module.		
1.2.03	<b>Scope of work within Divisions 1-49 of the Construction Specifications Institute:</b> RS Means Online or Costworks CDs: Building Construction Cost Data, Maintenance and Repair Cost Data, Electrical Cost Data, Mechanical Cost Data, Heavy Construction Cost Data, Plumbing Cost Data, Interior Cost Data, Site Work & Landscape Cost Data, Concrete & Masonry Cost Data is allowable if the appropriate line item is not found in the RS Means Online or Costworks CDs Facilities Construction Cost Data.		
1.2.04	<b>Scope of work within Division 22 of the Construction Specifications Institute:</b> The UPB for Division 22 Plumbing shall be the current edition of the RS Means Online or Costworks CD Plumbing Cost Data. Contract vendor may perform related services, such as unit repairs, services, and installations for equipment and processes within Divisions 2 (Demolition), 11 (Equipment), and 13 (Special Construction).		
1.2.05	<b>Scope of work within Division 22 of the Construction Specifications Institute:</b> To complete a plumbing project using other ancillary services from other divisions, use of current editions of RS Means Online or Costworks CDs: Building Construction Cost Data, Interior Cost Data, Electrical Cost Data, Mechanical Cost Data, Repair and Remodeling Cost Data, Site Work Cost Data, is allowable if the appropriate line item is not found in the Facilities Construction Cost Data. (A brief descriptive narrative shall be required for all jobs that use ancillary services. Mohave shall randomly review and verify the validity of these ancillary services. Any work deemed excessive or not necessary to complete a plumbing job shall not be allowed under this contract).		
1.2.06	<b>Scope of work within Division 23 of the Construction Specifications Institute:</b> The UPB for Division 23 Heating Ventilation and Air Conditioning (HVAC) shall be the current edition of the RS Means Online or Costworks CDs Mechanical Cost Data. Contract vendor may perform plumbing and electrical related services, such as unit repairs, services, and installations for equipment and processes within Divisions 2 (Demolition), 11 (Equipment), and 13 (Special Construction: Controls and Instrumentation).		

**Technical Proposal - Specifications**  
**(Place after Tab 1e)**

1.2.07	<p><b>Scope of work within Division 23 of the Construction Specifications Institute:</b> To complete a HVAC project using other ancillary services from other divisions, use of current editions of RS Means Online or Costworks CDs: Building Construction Cost Data, Interior Cost Data, Electrical Cost Data, Mechanical Cost Data, Plumbing Cost Data, Repair and Remodeling Cost Data, Site Work Cost Data, is allowable if the appropriate line item is not found in the Facilities Construction Cost Data. (A brief descriptive narrative shall be required for all jobs that use ancillary services. Mohave shall randomly review and verify the validity of these ancillary services. Any work deemed excessive or not necessary to complete a HVAC job shall not be allowed under this contract).</p>															
1.2.08	<p><b>Scope of work within Division 26 of the Construction Specifications Institute:</b> The UPB for Division 26 Electrical shall be the current edition of the RS Means Online or Costworks CDs Electrical Cost Data. Contract vendor may perform plumbing and electrical related services, such as unit repairs, services, and installations for equipment and processes within Divisions 2 (Demolition), 11 (Equipment), and 13 (Special Construction: Controls and Instrumentation).</p>															
1.2.09	<p><b>Scope of work within Division 26 of the Construction Specifications Institute:</b> To complete an electrical project using other ancillary services from other divisions, use of current editions of RS Means Online or Costworks CDs: Building Construction Cost Data, Interior Cost Data, Electrical Cost Data, Mechanical Cost Data, Plumbing Cost Data, Repair and Remodeling Cost Data, Site Work Cost Data, is allowable if the appropriate line item is not found in the Facilities Construction Cost Data. (A brief descriptive narrative shall be required for all jobs that use ancillary services. Mohave shall randomly review and verify the validity of these ancillary services. Any work deemed excessive or not necessary to complete a electrical job shall not be allowed under this contract).</p>															
1.2.10	<p>The Weighted City Cost Index (CCI) shall be applied to each division for the city closest to project location and the prices in "Total, include O &amp; P" column in the applicable UPB will be used for project costing.</p>															
1.2.11	<p>The total value of applicable line items and quantities shall be multiplied by the appropriate CCI and the specified coefficient to determine the lump sum cost of each job order.</p>															
1.2.12	<p>Contract vendor shall provide the member with an itemized project cost prior to starting any job order. At a minimum, the project cost shall include:</p> <table border="0"> <tr> <td>Date of Quote</td> <td>Item Number</td> <td>Applicable CCI:</td> </tr> <tr> <td>Item Description</td> <td>Number of Units</td> <td>(Year and Quarter)</td> </tr> <tr> <td>Total Line Cost</td> <td>Line Items Subtotal</td> <td>Unit Price</td> </tr> <tr> <td>Coefficient</td> <td>Unit Price Book used</td> <td>Grand Total</td> </tr> </table>	Date of Quote	Item Number	Applicable CCI:	Item Description	Number of Units	(Year and Quarter)	Total Line Cost	Line Items Subtotal	Unit Price	Coefficient	Unit Price Book used	Grand Total			
Date of Quote	Item Number	Applicable CCI:														
Item Description	Number of Units	(Year and Quarter)														
Total Line Cost	Line Items Subtotal	Unit Price														
Coefficient	Unit Price Book used	Grand Total														
1.2.13	<p>Items that cannot be found in the UPB or other approved RS Means cost data index are considered "non pre-priced" items. If the UPB or other approved cost data index contain an item that is basically the same in form, fit and function, it may be used to price a non-pre-priced item. If such pricing is used, substantiating rationale and documentation shall be included in the line item cost sheet.</p>															

**Technical Proposal - Specifications**  
**(Place after Tab 1e)**

<p>1.2.14 If like items cannot be found in the UPB, contract vendor shall obtain three written quotes for a non-pre-priced item and submit the quotes to Mohave. Mohave shall determine the most appropriate quote to use for adding the item to the approved contract pricing. If three quotes cannot reasonably be obtained for a non-pre-priced item, contract vendor shall explain why they were unable to obtain additional price quotes.</p>			
<p>1.2.15 Upon approval from Mohave, the non-pre-priced item shall become part of the contract pricing and available for any job order. Contract vendor shall not provide a new item unless and until Mohave approves it.</p>			
<p>1.2.16 A coefficient to be applied to the cost of non-pre-priced items shall be provided.</p>			
<p>1.2.17 Coefficients shall be provided for normal business hours (Monday – Friday, 7 a.m. – 5 p.m.) and “other” hours (after hours, weekends, and holidays). “Other” hours shall only be worked with prior approval from the member.</p>			
<p>1.2.18 Coefficients shall be extended no more than two decimal places.</p>			
<p>1.2.19 Coefficients shall include all costs associated with performing the work contained in the UPB. Such costs include, but are not limited to: the direct cost of doing the work; labor; overhead; general and administrative; profit; project office expenses; mobilization; close-out costs; insurance; compliance with current applicable federal, state and local laws and codes; protective clothing and equipment; traffic and work site barriers; computer systems and software; vehicles, maintenance and fuel; incidental costs and all contingencies connected to performing the work. <b><i>No additional payment will be allowed for these items.</i></b></p>			
<p>1.2.20 Offeror shall specify in the proposal what additional types of costs are included in the coefficients.</p>			
<p>1.2.21 UPB Division 1 sections before 54, Construction Aids, are excluded from the contract except as specified below. Such items shall be included in coefficients. Member may approve specific exceptions caused by unusual and unforeseen circumstances.</p>			
<p>1.2.22 The following UPB Division 1 items are allowed, when the specified work is required or authorized by the member:  01 21 53.50-0010 through 1750  01 45 23.50-0010 through 9000  01 51 13.80-0010 through 0700</p>			
<p>1.2.23 Labor, equipment and material prices shall be adjusted in accordance with the prices in each new edition of the UPB. Adjustments will be to the UPB only. No adjustment will be applied to cost items comprising the coefficient. No upward adjustment shall apply to job orders awarded prior to effective date of the adjustment, regardless of the date of commencement of work.</p>			
<p>1.2.24 All prices in the UPB are for completed-in-place construction unless explicitly described otherwise. Waste or excess material quantities are incidental costs, which are included within the coefficient unless explicitly stated otherwise. Quantities used on individual job order proposals shall be taken from field measurements or design plans, as appropriate, without allowance for waste.</p>			

**Technical Proposal - Specifications**  
**(Place after Tab 1e)**

<b>1.3 Pricing – Open Book Pricing Requirements</b>		
1.3.01	Upon member acceptance of the Open Book Pricing methodology to be used under the job order, the project’s direct job cost shall be based upon firm price quotes from contractors in the contract’s approved subcontractor list. To the extent practicable, contract vendor shall obtain firm price quotes from three contractors for each discipline applicable to the project. If three quotes cannot reasonably be obtained for a discipline, contract vendor shall explain why they were unable to obtain additional price quotes.	
1.3.02	Upon request, contract vendor shall provide member with copies of subcontractor quotes and the basis for selection of each subcontractor. Contract vendor shall provide member explanation for any rejected low quote.	
1.3.03	All costs shall be identified in the Open Book Pricing workbook and included in your price proposal.	
1.3.04	If the member objects to a selected subcontractor, member shall make the objection and the reasons for the objection known to the contract vendor. Contract vendor shall then present an acceptable subcontractor for the applicable discipline. Member shall not unreasonably object to or withhold approval of a subcontractor.	
1.3.05	General conditions are requirements directly related to the work, but not included in direct construction cost. General conditions shall include, but are not limited to: project management, estimating, quality control, and administrative labor; field office equipment, materials and supplies; travel and subsistence; temporary field office rental and utilities; submittals and operations and maintenance manuals; small tools, face and clothing protection; project scheduling; compliance with current applicable environmental laws; marketing; and Mohave’s 1% administrative fee.	
1.3.06	General and administrative costs include but are not limited to: home office general and administrative expense; excess liability and auto insurance; business licenses; and home office manager labor. General and administrative cost shall be assessed as a fixed multiplier applied to direct project cost and general conditions cost for the project.	
1.3.07	Profit shall be assessed as a fixed multiplier applied to direct project cost, general conditions cost, and general and administrative costs for the project. The amount of the profit multiplier shall be identified in the Open Book Pricing workbook and included in your price proposal.	
1.3.08	Each job order using Open Book Pricing shall include a completed copy of the worksheets named Price Summary and General Conditions provided in “JOC RFP 19F-0808 Open Book Price Summary.xlsx”. All costs shall be identified in the Open Book Pricing workbook and included in your price proposal. Substantially similar documents may be used with Mohave’s approval.	
<b>1.4 Pricing – Trade Service Requirements</b>		
1.4.01	As an alternative pricing methodology for service, repair, and maintenance projects, <i>Trade Service</i> price guide may be offered for product pricing. <i>Trade Service</i> price guide shall be for division(s) being offered.	
1.4.02	The <i>Trade Service</i> price guide shall be based on the most recent release of <i>Trade Service eData Flex Pricing Service</i> .	

**Technical Proposal - Specifications**  
**(Place after Tab 1e)**

1.4.03	Quarterly archived electrical price guide ( <i>Trade Service: eData Flex Pricing Service</i> ) shall be required under an awarded contract. Archived pricing shall be made available upon the release of quarterly updates from <i>Trade Service</i> . Mohave shall set the schedule for allowable quarterly and yearly updates.		
1.4.04	Contract vendor shall supply discounts, multipliers, and/or any references used to determine Mohave pricing for the <i>Trade Service</i> price guide.		
1.4.05	Installation/maintenance services using <i>Trade Service eData Flex Pricing Service</i> pricing for products shall include all costs for installation on member quotations.		
1.4.06	Contract vendor shall provide the member with an itemized project cost prior to starting any job order. At a minimum, the project cost shall include: Date of Quote                      Number of Units Item Number                        Item Description Item/Unit Cost                      Labor Rate Labor Hours                        Total Line Cost Line Items Subtotal                Grand Total		
1.4.07	Contract vendor may offer product only sales to members. Unit costs shall be based on <i>Trade Service</i> price guide.		
<b>1.5</b>	<b>Specifications for the Work</b>		
1.5.01	All work shall be performed in accordance with the attached specifications, as applicable to the awarded divisions.		
1.5.02	Contract vendor may recommend alternate specifications or additional specifications for work to be performed under a job order. Any alternate specification offered shall comply with all current applicable federal, state and local laws, and codes.		
1.5.03	Contract vendor shall obtain written approval from member prior to using any alternate specification for any work to be performed under the contract.		
1.5.04	Prior to starting any work, contract vendor shall notify member of any specification that is in conflict with current applicable federal, state and local laws and codes, and offer an alternate solution that is in compliance.		
1.5.05	When any aspect of a project is not covered by a specification or building code, the minimum standard for good and workmanlike construction shall be performed in accordance with the current National Electrical Contractors Association's standards for Good Workmanship in Electrical Construction.		
1.5.06	No products that contain asbestos fibers shall be used.		
1.5.07	Where practicable, all work shall be accomplished in a manner to match existing work in the same area or on the same elevation. Contract vendor shall not make adjustments to or alter in any manner member's existing facilities without prior written approval from member.		
1.5.08	Upon completion of the work, worksite shall be clean and free from debris.		
<b>1.6</b>	<b>Services</b>		
1.6.01	Upon request from member, contract vendor shall obtain the permits required for a job order. Contract vendor shall only be allowed to invoice for the actual cost of the permit. No amount for overhead and profit shall be allowed on permit costs.		

**Technical Proposal - Specifications**  
**(Place after Tab 1e)**

1.6.02	Upon request from member, and if included in the awarded contract, contract vendor shall provide design services related to the job order. Such services are only allowable as part of an executed Job Order Contracting purchase order.		
1.6.03	Design services shall be provided in accordance with current applicable federal, state and local laws and codes.		
1.6.04	Upon request from member, and if included in the awarded contract, contract vendor shall provide engineering services related to the job order. Such services are only allowable as part of an executed Job Order Contracting purchase order.		
1.6.05	Engineering services shall be provided in accordance with current applicable federal, state and local laws, and codes.		
1.6.06	Upon request from member, and if included in the awarded contract, contract vendor shall provide maintenance services related to the job order. Such services are only allowable as part of an executed Job Order Contracting purchase order.		
1.6.07	Maintenance services shall be provided in accordance with current applicable federal, state and local laws and codes.		
1.6.08	There shall be no charge for repair services prior to expiration of the warranty period.		

**\*Exceptions/deviations must be listed on the *Scope of Work and Specifications Acceptance Form*. List the specification number for each exception/deviation.**

**Technical Proposal - Scope of Work and  
Specifications Acceptance Form  
(Place after Tab 1e)**

*Signature on page 2 certifies complete acceptance of the Scope of Work and Specifications in this solicitation, except as noted below (additional pages may be attached, if necessary).*

**Check one of the following responses to the Scope of Work and Specifications:**

- We take no exceptions/deviations to the Scope of Work and Specifications.**

*(Note: If nothing is listed below, it is understood that no exceptions/deviations are taken.)*

- We take the following exceptions/deviations to the Scope of Work and Specifications. All exceptions/deviations shall be clearly explained. Reference the corresponding Scope of Work or Specifications that you are taking exceptions/deviations to. Provide details on your exceptions/deviations below:**

*(Note: All requested exceptions/deviations must be clearly explained. Reference the specific language that you are taking exceptions/deviations to, detail any proposed substitute language, and clearly explain how the exceptions/deviations meet or exceed Scope of Work and Specifications. Unacceptable exceptions/deviations shall remove your proposal from consideration for award. Mohave shall be the sole judge on the acceptance of exceptions/deviations and Mohave's decision shall be final.)*

**Anti-Lobbying Certification Form**  
**(Place after Tab 1g)**

**ANTI-LOBBYING CERTIFICATION**

Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions

In accordance with the Byrd Anti-Lobbying Amendment 31 U.S. Code § 1352, CFR § 200.450 and Federal Acquisition Regulation 52.203-11:

(a) The definitions and prohibitions contained in the clause, at FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions, included in this solicitation, are hereby incorporated by reference in paragraph (b) of this certification.

(b) The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief that:

- (1) No Federal appropriated funds have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of this contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement;
- (2) If any funds other than Federal appropriated funds have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the offeror shall complete and submit, with its offer, OMB standard form LLL, Disclosure of Lobbying Activities, to the Contracting Officer in accordance with its instructions; and
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subcontract awards at all tiers and require that all recipients of subcontract awards in excess of \$100,000 shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by 31 U.S. Code § 1352. Any person who makes expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision shall be subject to a civil penalty of not less than \$10,000, and not more than \$100,000, for each such failure.

\_\_\_\_\_  
(Firm Name)

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Print Name)

\_\_\_\_\_  
(Print Title)

\_\_\_\_\_  
(Date Certified)

**UNITED STATES DEPARTMENT OF AGRICULTURE**

**Certification Regarding Debarment, Suspension, Ineligibility  
and Voluntary Exclusion Lower Tier Covered Transactions**

*The following statement is made in accordance with the Privacy Act of 1974 (5 U.S.C. § 552(a), as amended). This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, and 2 C.F.R. §§ 180.300, 180.355, Participants' responsibilities. The regulations were amended and published on August 31, 2005, in 70 Fed. Reg. 51865-51880. Copies of the regulations may be obtained by contacting the Department of Agriculture agency offering the proposed covered transaction.*

*According to the Paperwork Reduction Act of 1995 an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0505-0027. The time required to complete this information collection is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The provisions of appropriate criminal and civil fraud privacy, and other statutes may be applicable to the information provided.*

**(Read Instructions On Page Two (RFP Page 21) Before Completing Certification)**

- A. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency;
- B. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Organization Name

PR/Award Number or Project Name

Name(s) and Title(s) of Authorized Representative(s)

Signature(s)

Date

*The U.S. Department of Agriculture (USDA) prohibits discrimination in all of its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs). Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Assistant Secretary for Civil Rights, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, S.W., Stop 9410, Washington, DC 20250-9410, or call toll-free at (866) 632-9992 (English) or (800) 877-8339 (TDD) or (866) 377-8642 (English Federal-relay) or (800) 845-6136 (Spanish Federal-relay). USDA is an equal opportunity provider and employer.*

**Instructions for Certification (for Form AD-1048)**

1. By signing and submitting this form, the prospective lower tier participant is providing the certification set out on 1 (RFP page 20) in accordance with these instructions.
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension or debarment.
3. The prospective lower tier participant shall provide immediate written notice to the person(s) to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549, at 2 C.F.R. Parts 180 and 417. You may contact the department or agency to which this proposal is being submitted for assistance in obtaining a copy of those regulations.
5. The prospective lower tier participant agrees by submitting this form that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
6. The prospective lower tier participant further agrees by submitting this form that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the System for Award Management (SAM) database.
8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
9. Except for transactions authorized under paragraph (5) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

**Technical Proposal – Primary Vendor Information**

**Method of Approach  
(Place after Tab 2a)**

**Offeror shall respond to each item below. The information will be used to assist Mohave in evaluating the method of approach that an offeror would take regarding specific issues under an awarded contract. Do not use "boilerplate" answers. Respond to each item by specifically addressing the Mohave request. Failure to complete all questions may result in your proposal being considered nonresponsive.**

1. Offeror shall provide a project plan that describes how the offeror intends to implement the plan. This plan shall include, but not be limited to:
  - a. Account team structure (for a Mohave contract) and role which includes, but is not limited to description of sales contact process, account team support, and periodic account review processes;
  - b. Communication process with Mohave and its members;
  - c. Specific value-added services that may benefit members;
  - d. Indicate how you will ensure your sales staff does not sell products or services that are not on contract; and
  - e. Are there any limitations to the types of members that you will provide services to? If so, indicate what those limitations are.
  
2. Mohave is established to offer a cooperative purchasing program, which can be accomplished more efficiently and economically as a multi-entity operation.

Efficiency and economy can be established through reduced bidding effort for members and vendors, management of a single contract, fewer price schedules to maintain, fewer contact persons, and using Mohave as an extension of members' purchasing departments. Additionally, it is Mohave's assertion that a statewide contract available to approximately 450 public agencies results in economies of scale and lower prices than those received by bidding individual contracts, especially, but not limited to small member agencies.

Will a contract based upon your proposal result in the efficiencies and economies described above?

Yes \_\_\_\_ No \_\_\_\_\_

If no, what efficiencies and economies would members receive from a contract based on your proposal?

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3. In previous JOC contracts, Mohave has had isolated issues with members using design work (estimates, drawings, etc.) to shop our contracts against each other, or against other non-Mohave contracts. How would you prevent such issues from occurring under an awarded contract?

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**Technical Proposal – Primary Vendor Information**

**Method of Approach  
(Place after Tab 2a)**

4. Indicate if your proposal is regional or statewide:      Regional \_\_\_\_\_ Statewide \_\_\_\_\_

**If you are providing a regional or county specific offer, that offer shall cover all members within that region or county.**

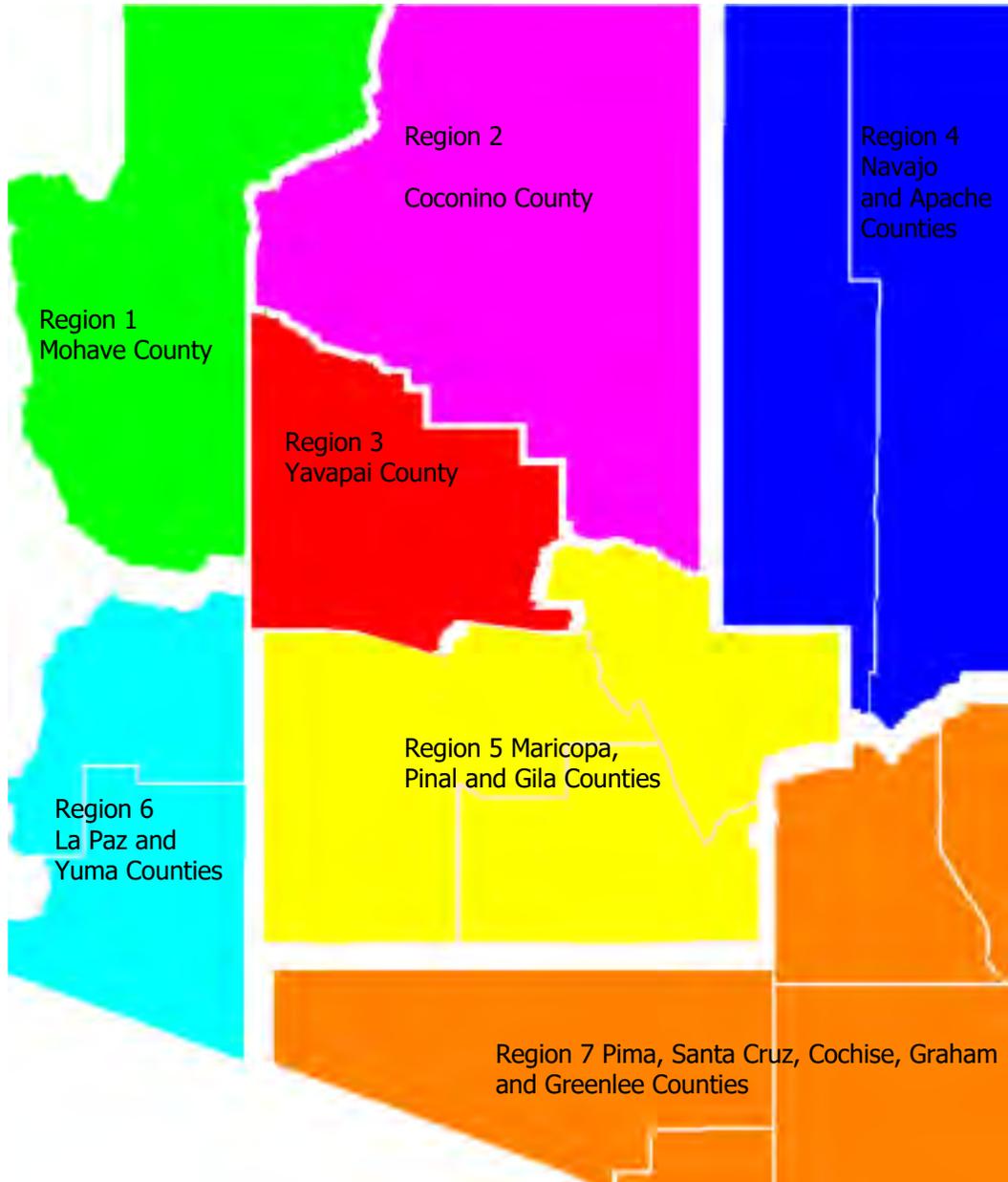
Regardless if your firm is providing statewide or regional/county services, complete the chart below to include the following:

- a. In the past three years, what percent of your Arizona business do you estimate was in each geographical area identified below?
- b. Based upon the regional map on Page 18, indicate which regions, or specific cities/counties within a region, that you will provide services under an awarded contract.
- c. If you are awarded a contract with Mohave, which area(s) of the state will your sales force target?

Region	Counties	a: Percentage of Business	b: Regions You Will Provide Services In	c: Regions Sales Force Will Target
1	Mohave			
2	Coconino			
3	Yavapai			
4	Navajo and Apache			
5	Maricopa, Pinal and Gila			
6	La Paz, Yuma			
7	Pima, Santa Cruz, Cochise, Graham and Greenlee			

**Technical Proposal – Primary Vendor Information**  
**Method of Approach**  
**(Place after Tab 2a)**

Below is a map, detailing the regions, and the counties that fall within each region.



**Technical Proposal – Primary Vendor Information**  
**Qualifications and Experience**  
**(Place after Tab 2b and 2e)**

**Offeror shall respond to each item below. The information will be used to assist Mohave in evaluating the qualifications and experience of the offeror. Do not use “boilerplate” answers. Respond to each item by specifically addressing the Mohave request. Failure to complete all questions may result in your proposal being considered nonresponsive.**

1. **Place after Tab 2b:** Prepare a summary of your firm, explaining the qualifications and experience necessary to provide the services in this solicitation as follows:
  - A short narrative description of what you are offering for this contract.
  - A *brief* history of your company that includes length of time in business, how long your company has provided the products/services you are proposing, and your firm’s philosophy of doing business.
  - Provide written verification if offeror has recently purchased an established business or has proof of prior success in this business or a closely related business.
2. **Place after Tab 2b:** Identify any past or pending litigation or mediation involving products or services your firm has provided within the last five (5) years.
3. **Place after Tab 2b:** Indicate if your firm would qualify as a small or minority owned business. To qualify for ownership as a minority owned business, at least 51% of the firm’s ownership must be held by a person, or persons, of a particular group (e.g., Woman owned, Hispanic owned, Native American owned). Proof of ownership is evidenced by the transaction privilege tax license or business privilege license for sole proprietorship; business privilege license **and** written partnership agreement for partnerships; or the Articles of Incorporation, Corporate By-laws **and** stock certificates for corporations.

*NOTE: Businesses have equal opportunity to sign up as a prospective bidder on Mohave’s website. If small or minority owned businesses were signed up for a category selected for this solicitation, then they are included in the solicitation notification email list. The information on small and minority owned business are for informational purposes only and shall not be a factor in the evaluation. Mohave cannot ensure that affirmative steps have been used to assure small and minority owned businesses are awarded contracts, as funding sources of our members vary.*

4. **Place after Tab 2b:** An online survey has been created to allow for the collection of reference information from Arizona public agencies where work and services have been successfully accomplished in the past five (5) years, for specific products/services similar to this solicitation. Provide the following link to Arizona public agencies who can provide reference information for your firm:  
**<https://www.surveymonkey.com/r/QHMZTKL>**

The above survey is now active and will remain active until the due date and time for this solicitation. It is recommended that you send this link to as many Arizona public agencies as you determine to be appropriate, in order to ensure that Mohave receives a minimum of three (3) completed surveys.

If you cannot provide the link to three (3) Arizona public agencies, provide the link to other public agencies not located in Arizona. If you cannot provide the link to public agencies, do so with private business entities.

5. **Place after Tab 2b:** Provide copy of current of all Arizona contractor’s licenses held by your company.
6. **Place after Tab 2e:** Provide a current letter from your financial institution indicating the range of credit available to your firm, (e.g., “credit in the low nine figures” or “credit line exceeding five figures”). Provide a current letter from your financial institution and/or officers of major suppliers, indicating confidence in your firm’s stability and payment history. *These letters will only be used to evaluate proposals and will not be made available to the public.*

Offerors may submit current audited annual financial reports in lieu of letters from financial institutions. However, the annual financial reports must provide essentially the same information as requested from the letters. Offerors are encouraged to highlight the requested information in any audited annual financial report submitted in response to this solicitation. All financial information will be kept confidential.

**Technical Proposal – Primary Vendor Information**  
**Past Performance and Management Plans**  
**(Place after Tab 2c)**

- 1) Provide a list of your firm's job order contracts for the last three years.
  - a. *Include date, contracting agency, contract amount, and contact information for each.*
  - b. *If your firm has no Job Order Contracting experience, provide the required information for your major construction projects.*
- 2) If your firm has no Job Order Contracting experience, provide a description of your philosophy and experience partnering as a member of a team consisting of the owner, owner's customers, and the contractor.
- 3) Provide a description of your experience working on school district or other governmental projects, working on multiple projects simultaneously, and working throughout the state. Include any specialized projects, such as airports, that require proven experience, training, knowledge, and/or certifications.
- 4) Provide a statement of your history for submitting claims and change orders.
  - a. *Provide specific information, e.g., type of claim, date, reason, amount, and outcome.*
- 5) Indicate if you are offering design, engineering, maintenance, and/or operations services.
  - a. *Describe the services you are offering.*
  - b. *Indicate if in-house staff will provide the services.*
  - c. *Indicate the portions of a project that may be subcontracted to other firms.*
  - d. *Provide a statement of your experience or the subcontractor's experience providing the services, particularly in a job order contract setting.*
- 6) Provide a Contract Management Plan.
  - a. *Provide a statement of your plan for performing and managing the work.*
  - b. *What personnel will be used?*
  - c. *How many employees are located in Arizona?*
  - d. *How do you plan to ensure prompt responses to job order requests?*
  - e. *How do you plan to ensure an adequate workforce is maintained?*
  - f. *What is your plan for responding to and performing multiple job orders at the same time?*
  - g. *What limitations will you have geographically or in the number of simultaneous job orders?*
  - h. *Provide other pertinent information that will help Mohave evaluate your firm and its capabilities.*
  - i. *Describe your experience in pricing projects using a UPB and a coefficient, an Open Book pricing methodology, and Trade Service (if applicable).*
  - j. *Specifications 1.2.01 - 1.2.24 contain comprehensive requirements regarding the use of RS Means Online or Costworks CDs as the basis for the UPB for an awarded contract. If you are utilizing a different software product to prepare your quotations, proposals and invoices, provide detailed examples and information showing how you intend to comply with the specification requirements regarding RS Means Online or Costworks CDs as the basis for the UPB.*

**Technical Proposal – Primary Vendor Information**  
**Past Performance and Management Plans**  
**(Place after Tab 2c)**

- 7) Describe your Quality Management Plan.
- a. *How do you set goals and monitor the performance of your company?*
  - b. *How do you inspect the work to ensure quality?*
  - c. *How do you stay on schedule?*
  - d. *What is your complaint and dispute resolution procedure?*
  - e. *Provide other pertinent information that will help Mohave evaluate your firm and its capabilities.*
- 8) Describe your Subcontractor Management Plan.
- a. *Provide a statement of your plan for managing subcontractors.*
  - b. *Provide a statement acknowledging your intent to not use price as the sole determining factor when selecting subcontractors under any awarded contract. (See Special Term and Condition 12.6.)*
  - c. *How will you recruit subcontractors, particularly in the local communities where work will be performed?*
  - d. *Describe how you would use local subcontractors to accomplish the work.*
  - e. *How will you ensure acceptable quality for work performed by subcontractors?*
  - f. *How will you address controversies and claims related to work performed by subcontractors?*
  - g. *Provide other pertinent information that will help Mohave evaluate your subcontractor management capabilities.*
  - h. *Provide a list, including firm name, location, and current license number, for subcontractors your firm currently uses.*
  - i. *For firms who self-perform and do not subcontract work, provide your confirmation that any future subcontracts shall follow the requirements specified in the subcontractor management plan noted above. Mohave may request a copy of your plan prior to allowing subcontracting under an awarded contract.*
- 9) Describe your Safety Plan.
- a. *Provide a current letter from your firm's insurance company stating the Workers' Compensation Experience Modification Rate (EMR) for the past three (3) years. The letter shall be on the insurance company's letterhead and signed by an appropriate individual employed by the insurance company.*
  - b. *If your EMR is greater than 1, what actions will you take to lower it?*
  - c. *Describe your firm's safety oversight. Do you have a safety manager?*
  - d. *Describe the safety training used by your firm and provide a copy of your firm's safety training program.*

**Price Proposal – Primary Vendor Information**  
**(Place in a clearly marked, separate sealed envelope)**

**IF YOUR FIRM WAS SHORTLISTED FOR DIVISION 22 PLUMBING, DIVISION 23 HEATING, VENTILATION AND AIR CONDITIONING OR DIVISION 26 ELECTRICAL, PROVIDE COEFFICIENTS AND PRICING INFORMATION FOR BOTH DIVISIONS OR INDICATE IF THE COEFFICIENTS WILL BE IDENTICAL FOR BOTH DIVISIONS.**

**Price Proposal shall be submitted in a clearly marked, separate sealed envelope. Offeror shall provide a price proposal to include the following information:**

- 1. Name and Date of the Unit Price Book (UPB):**
- 2. Coefficient(s) to be applied to pre-priced items (items listed in the UPB) for work performed during:**
  - Normal business hours (Monday - Friday 7 a.m. - 5 p.m.)
  - Other hours (after hours, weekends, and holidays)
  - Note adjustments to the coefficient(s), if applicable, for work performed in different regions of the state.
- 3. Coefficient(s) to be applied to non pre-priced items (items not listed in the UPB) for work performed during:**
  - Normal business hours (Monday - Friday 7 a.m. - 5 p.m.)
  - Other hours (after hours, weekends, and holidays)
  - Note adjustments to the coefficient(s), if applicable, for work performed in different regions of the state.

**Notes:** Provide a brief explanation of the rationale for your coefficients. The rationale should indicate how you determined the cost of doing the work and the various elements that made up your coefficients. See Specification 1.2.13, Pricing, for additional information.

**4. Open Book Pricing Workbook:**

**NOTE: *The workbook contains cells that include formulas to calculate total costs. Do not override the formulas within these cells.***

If offeror is including the Open Book Pricing methodology in their price proposal, the Open Book Price workbook shall be completed as follows:

- Provide complete information in the worksheet titled, "*Price Summary*" in the electronic Open Book Price workbook titled, "*19F-0808 Open Book Price Summary.xlsx*" includes yellow highlighted cells for *General and Administrative Cost (G&A)* and *Profit*. Place the percentage value your firm will use to calculate overhead and profit for the Direct Project Costs and General Conditions.
- The worksheet titled, "*General Conditions*" in the electronic Open Book Price workbook titled, "*19F-0808 Open Book Price Summary.xlsx*", includes general conditions, services, or costs not identified or included in the subcontractor quotations.
- Provide the labor and/or service unit price for the yellow highlighted cells in the section titled, *Admin Fee Items: Unit Price*. Additionally, include the unit of measure (e.g. per hour, per day, per week) as applicable in the *Unit Of Measure* column.
- Provide additional costs as applicable for yellow highlighted cells in the section titled, *Non-Admin Fee Items*. Non-Admin Fee items include costs that are "passed-through" to member at cost to the contract vendor. *Mohave shall not collect administration fees on the above non-admin fee items.*
- Add line items to the Admin and/or Non-Admin Fee schedules as necessary.
- **Only services/costs identified in this price schedule will be allowed under an awarded contract.**
- This workbook will serve as your quoting template for all open book projects under an awarded contract.

**Price Proposal – Primary Vendor Information**  
**(Place in a clearly marked, separate sealed envelope)**

**5. Trade Service Price Guides for items and services not included in the UPB:**

- The pricing methodology to determine the Mohave price shall be:
  - Discount off list (specify discount).
  - Discount off Column Two (specify discount) when List Price is unavailable.

**6. Professional Services (Provide the applicable hourly rate for each service offered. No coefficient will be applied to these rates.)**

- Design Services
- Engineering Services
- Other Professional Services (specify service and rate)

**7. Maintenance Services and Extended Warranties (Provide the cost for all maintenance services and extended warranties that are available after the warranty period. No coefficient will be applied to these prices.)**

**8. Other Charges (Provide any additional costs, or incidental charges. Such charges may include the items listed below. No coefficient will be applied to these charges.)**

- 100% Performance and Payment Bonds
- Meals and incidental expenses (M&IE), transportation and lodging
- Mobilization (Indicate when mobilization charges would apply.)

*NOTE: Mobilization may only be used with projects priced using Trade Service and labor. Mobilization charges shall not be allowed with UPB or Open Book Pricing methodologies.*

- Other

**9. Will you offer members a quick pay discount if payment is made within 10 or 20 days? Yes \_\_\_ No \_\_\_**

- If Yes, what is the discount for 10 days? \_\_\_\_\_ 20 days? \_\_\_\_\_

**Travel Description**

If travel rates are applicable, describe how they are calculated, and when they are necessary, (e.g. 50 miles from origin). Include information regarding what the travel rates cover. (See **Pricing: Reimbursement for Transportation, Mileage, Lodging, Meals and Incidental Expenses** in the Special Terms and Conditions.)

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**Bond Methodology Description**

Provide detailed information explaining the methodology to be used when bonds are applied to projects. Describe in detail the method your surety company requires you to use (e.g., bonds are applied before sales tax is applied, bonds are applied after sales tax is applied). Mohave will use this information to verify that your firm is consistently charging bonds in the same manner under an awarded contract.

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**Technical Proposal – Supporting Contract Documents – Firm Information,  
Order Processing, Individual Contact, and Customer Support Information  
(Place after Tab 4a)**

1. Contact information for firm's headquarters:

Physical Address \_\_\_\_\_

Mail Address, if different \_\_\_\_\_

Main Phone Number \_\_\_\_\_

Website \_\_\_\_\_

2. Contact information for firm's Arizona branch office:

Physical Address \_\_\_\_\_

Mail Address, if different \_\_\_\_\_

Main Phone Number \_\_\_\_\_

Website, if different \_\_\_\_\_

Add additional contact information if firm has more than one Arizona branch office.

3. Contact information for purchase orders:

Physical Address \_\_\_\_\_

Email Address \_\_\_\_\_

Attention of \_\_\_\_\_

4. Payment remittance address \_\_\_\_\_

Attn: \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone (invoice questions) \_\_\_\_\_

5. Provide Arizona Transaction Privilege (sales) Tax License Number: \_\_\_\_\_

Do you collect city, county and/or other local sales tax in Arizona? Yes \_\_\_ No \_\_\_

*If yes, please check one:*

Our combined state, city, county and/or other local sales tax rate is \_\_\_% (local rate).

The sales tax rate varies by the location (e.g. ship to rate). Provide additional information below:

\_\_\_\_\_  
\_\_\_\_\_

6. Acceptance of Pcards for Payment:

Will you accept Pcards as a method of payment? Yes \_\_\_\_\_ No \_\_\_\_\_

**Technical Proposal – Supporting Contract Documents – Firm Information,  
Order Processing, Individual Contact, and Customer Support Information  
(Place after Tab 4a)**

7. Contacts for Mohave:

**Main Mohave representative contact:** \_\_\_\_\_

*(Shall be the main point of contact for members and be responsible for member information requests.)*

Title \_\_\_\_\_ Email address \_\_\_\_\_

Phone number \_\_\_\_\_ Fax \_\_\_\_\_

**Contract Administrator contact:** \_\_\_\_\_

*(Shall be the main point of contact for contract information requests.)*

Title \_\_\_\_\_ Email address \_\_\_\_\_

Phone number \_\_\_\_\_ Fax \_\_\_\_\_

**Accounting contact:** \_\_\_\_\_

*(Shall be the main point of contact for accounting issues.)*

Title \_\_\_\_\_ Email address \_\_\_\_\_

Phone number \_\_\_\_\_ Fax \_\_\_\_\_

**Open Order/Status Report contact:** \_\_\_\_\_

*(Shall be the main point of contact regarding open orders and status reports.)*

Title \_\_\_\_\_ Email address \_\_\_\_\_

Phone number \_\_\_\_\_ Fax \_\_\_\_\_

**Audit contact:** \_\_\_\_\_

*(Shall be the main point of contact for audit requests and clarifications.)*

Title \_\_\_\_\_ Email address \_\_\_\_\_

Phone number \_\_\_\_\_ Fax \_\_\_\_\_

**Reconciliation contact:** \_\_\_\_\_

*(Shall be the main point of contact for reconciliation report requests and/or clarifications and payment of administration fees.)*

Title \_\_\_\_\_ Email address \_\_\_\_\_

Phone number \_\_\_\_\_ Fax \_\_\_\_\_

**Escalation contact:** \_\_\_\_\_

*(Shall be the main point of contact when an issue needs to be escalated above the main contact and/or contract administrator for the RFP/contract. **This contact shall be a different individual than those named for the contacts listed above.** )*

Title \_\_\_\_\_ Email address \_\_\_\_\_

Phone number \_\_\_\_\_ Fax \_\_\_\_\_

**Marketing contact:** \_\_\_\_\_

*(Shall be the main point of contact for providing marketing information for Mohave's website.)*

Title \_\_\_\_\_ Email address \_\_\_\_\_

Phone number \_\_\_\_\_ Fax \_\_\_\_\_

**Technical Proposal – Supporting Contract Documents – Firm Information,  
Order Processing, Individual Contact, and Customer Support Information  
(Place after Tab 4a)**

**Provide the requested customer support information for warranty and maintenance service offered by your firm, as applicable.**

Do you provide warranty and maintenance for the items in the proposal?

**Yes**, the following is applicable to our offer. (If yes, please provide the information below.)

**No**, the following is not applicable to our offer.

Describe the steps a member should take to activate a warranty and how they obtain warranty and maintenance service.

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Provide the name and address of the facility that will provide warranty and maintenance service, under an awarded contract. Additionally, provide a contact person and phone number for warranty and maintenance service. If there is more than one facility, provide the names and addresses for all facilities. Attach a list if necessary.

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Do you provide technical assistance via phone?  Yes  No If yes, provide a phone number and contact.

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What is your service response time for metropolitan areas (e.g., Phoenix, Tucson) and rural areas?

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**Technical Proposal – Supporting Contract Documents**  
**Sample Supplemental or End User Agreement(s)**  
**(Place after Tab 4b)**

Will members be required to sign supplemental or end-user agreements (sales, maintenance)?  
(See **3.1 Contract vendor documents** in the Special Terms and Conditions)

Yes  No

If yes, review/revise your agreement(s) for terms that conflict with the Mohave terms and conditions. In addition, review for the following common issues:

Acceptable agreements **shall** include:

- Non-appropriations clause;
- Contract or agreement must be governed by the laws of the State of Arizona;
- Net payment is thirty (30) days.

Agreements **shall not** include:

- Terms beyond one year;
- Waiver of right for a jury trial;
- Requirement of upfront payment by member when purchase order is placed;
- Entire agreement language;
- Auto-renewal language.

Attach your reviewed/revise agreement(s). **Unacceptable agreement(s) may render your proposal nonresponsive.**

**Technical Proposal – Supporting Contract Documents**  
**Extended Warranty and Maintenance Plan Information**  
**(Place after Tab 4c)**

Do you offer extended warranty or maintenance service plans?  Yes  No

If yes, provide a summary of the plans here and/or copies of the plans after this page. Include pricing for extended warranty or maintenance service plans in your price schedule after **Tab 3a**. Place any supplemental end-user agreement forms, which include terms and conditions and/or member signature after **Tab 4b**.

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**Technical Proposal – Bid Bond**  
**(Place after Tab 1f)**

KNOW ALL MEN BY THESE PRESENTS:

THAT, \_\_\_\_\_  
(hereinafter called Principal), as Principal, and \_\_\_\_\_  
a corporation organized and existing under the laws of the State of \_\_\_\_\_, with its principal office in  
the city of \_\_\_\_\_, (hereinafter called the  
Surety), as Surety, are held and firmly bound unto Mohave Educational Services Cooperative, Inc. in the  
State of Arizona, (hereinafter called the Obligee) in the amount of \$100,000 for payment whereof the said  
Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns,  
jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for Job Order Contracting for Job Order Contracting for  
Various Construction Trades.

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter  
into a contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as  
may be specified in the bidding or contract documents with good and sufficient surety for the faithful  
performance of such contract and for the prompt payment of labor and material furnished in the prosecution  
thereof, or in the event of the failure of the Principal to enter into such contract and give such bond or  
bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the  
amount specified in said bid and such larger amount for which the Obligee may in good faith contract with  
another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise  
to remain in full force and effect.

The prevailing party in a suit on this bond shall recover as part of his judgment such reasonable attorney  
fees as may be fixed by a judge of the court.

Witness our hands this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
PRINCIPAL SEAL

\_\_\_\_\_  
BY

\_\_\_\_\_  
SURETY SEAL

\_\_\_\_\_  
BY

\_\_\_\_\_  
AGENCY OF RECORD

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**Technical Proposal – Special Terms and Conditions**  
**(Place after Tab 1d)**

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Some Special Terms and Conditions specify placement of information in tabs other than Tab 1d as noted in the title above. Pay close attention to placement information (identified in bold text) as indicated in select Special Terms and Conditions.

**1. BID BONDS AND BONDING CAPACITY**

**1.1. Bid Bond:** Offeror shall provide an original bid bond or alternate bid security in the amount of **\$100,000. Place after Tab 1f.** Note: Bid security as a percentage of the bid value (e.g. – 10% of contract award) is not acceptable.

**1.2. Bonding Capacity:** The required minimum single job bonding capacity for this contract shall be \$1,000,000. Bidder shall provide a letter from your bonding agency describing your current bonding capacity, as follows:

- Your single job bonding capacity.
- Your aggregate bonding capacity.
- An agent of your licensed bonding agency shall sign the letter.

If the original letter is not signed and/or has conflicting information, it shall render your technical proposal nonresponsive. **Place letter from bonding agency after Tab 1f.**

**2. DELIVERY**

**2.1. Default in one installment to constitute total breach:** Contract vendor shall deliver conforming materials in each installment or lot under this contract and may not substitute nonconforming materials. Mohave reserves the right to declare a breach of contract if contract vendor delivers nonconforming materials to any member under this contract.

**2.2. Defective goods:** Contract vendor agrees to arrange and pay for return shipment of goods that arrive in a defective or non-operable condition.

**2.3. Delivery time:** Failure to deliver any order within the time frame specified on the purchase order may result in cancellation of that purchase order.

**2.4. Improper delivery:** If the goods or tender of delivery fail in any respect to conform to this contract, member may reject the whole, accept the whole, or accept any commercial unit or units and reject the rest.

**2.5. Restocking fees:** A restocking fee may only be charged on products ordered and delivered to member's site. Restocking fees in excess of fifteen percent (15%) shall not be allowed. Contract vendor may waive restocking fees. Restocking and return shipping charges shall be identified in the price workbook.

**3. FORM OF CONTRACT**

**3.1. Contract vendor contract documents:** If a firm submitting an offer requires member to sign an additional agreement, a copy of the proposed agreement shall be included with the proposal.

If awarded a contract, any additional contract vendor's documents shall not become part of Mohave's contract unless, and until, an authorized representative of Mohave reviews and approves them.

Contract vendor agrees to provide Mohave a copy of any agreements that are revised during the term of an awarded contract, prior to having the member sign the agreement.

**3.2. Design and engineering services:** This is not a contract for design or engineering services. Upon request from member, and if included in the awarded contract, contract vendor shall provide design services related to the job order. Such services are only allowable as part of an executed JOC purchase order, for performing services within the specifications and scope of work.

**3.3. Form of contract:** The form of contract for this solicitation shall be the Request For Proposal, the awarded proposal(s), the Request for Qualifications (RFQ), and properly issued member purchase orders referencing the requirements of the Request For Proposal.

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**Technical Proposal – Special Terms and Conditions**  
**(Place after Tab 1d)**

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**3.4. Parol evidence:** The contract represents the final written expression of agreement. All agreements are contained herein and no other agreements or representations that materially alter it are acceptable.

**4. INSTALLATION**

Installation shall be scheduled directly with member and be done in a reasonable amount of time. Installation shall be in accordance with the manufacturer's instructions and shall be accomplished by skilled and properly licensed individuals.

**5. INSURANCE**

**5.1. Certificate:** Evidence of the required insurance shall be provided with your technical proposal by means of a current certificate of insurance with the coverage's as stated within the requirements below. Before any orders are processed under an awarded contract, contract vendor shall provide a certificate that names Mohave Educational Services Cooperative, Inc. as the certificate holder.

**Certificate (or certificates if using multiple carriers) shall include, at a minimum, coverage for:**

- General Liability
- Automobile liability
- Umbrella or Excess Liability
- Workers' Compensation

In addition, contract vendor must be willing to provide, upon request, identical certificate of insurance to any member using this contract. Contract vendor must also be willing, upon request, to add any member as an additional insured entity. Any costs for adding a member as an additionally insured entity shall be clearly identified in submitted contract pricing. If no pricing is identified, adding a member as an additionally insured entity shall be provided at no additional cost.

**Provide evidence of current insurance coverage after Tab 2d.**

**5.2. Deductibles:** Contract vendor shall pay the deductibles required by the insurance provided under this contract.

**5.3. Liability insurance:** Prior to commencing services under this contract, contract vendor shall procure and maintain during the life of this agreement, comprehensive general liability insurance, to include automobile liability, providing limits of an aggregate amount of not less than \$2,000,000.

**5.4. Scope of Insurance:** Contract vendor's insurance shall provide adequate protection for contract vendor against damage claims which may arise from operations under this contract, whether such operations are by the insured or by anyone directly or indirectly employed by the insured. All insurance must be written by companies incorporated within the United States (exclusive of Territories or Possessions) and licensed or authorized to do business in Arizona.

**5.5. Subcontractor insurance:** Prior to commencing any work, any subcontractor shall procure and maintain at its own expense until final acceptance of the work, insurance coverage in a form and from insurers acceptable to the prime contractor. All subcontractors will provide workers' compensation insurance, which waives all subrogation rights against the prime contractor, member and Mohave.

**5.6. Workers' compensation insurance:** Contract vendor shall also procure and maintain during the life of this agreement, workers' compensation insurance for all of contract vendor's employees engaged in work under the contract. All workers' compensation insurance will be in compliance with Arizona state statute and evidenced by a certificate of insurance.

**Technical Proposal – Special Terms and Conditions**  
**(Place after Tab 1d)**

**6. MAINTENANCE FACILITIES AND SUPPORT**

It is preferred that each contract vendor should have maintenance facilities and a maintenance support system available for servicing products throughout Arizona, or the regions specified in their offer. Maintenance facilities shall have sufficient parts inventory to provide quality service on products sold to members. Trained and qualified technicians shall be available to cover all parts of the state, or specific regions within the state for regional offers. It is preferred that maintenance services are available within 24 hours. If a third party is used to provide maintenance or warranty work, offeror shall include details of any such arrangement in the proposal.

**7. MANUFACTURER SUPPORT**

Offerors submitting proposals as a manufacturer's representative must be able, if requested by Mohave, to supplement the proposal with a letter from the manufacturer certifying that offeror is a bona fide dealer for the equipment offered, and that offeror is authorized to submit a proposal on such equipment.

**8. MEMBER AGREEMENTS**

Some members may request the addition of specific requirements that would apply to products and services purchased under an awarded contract. These additional requirements shall be addressed through the use of an additional member agreement. In any agreement between the contract vendor and a member based on this contract, the terms and conditions of this contract shall prevail. Contract vendor and member must agree to all provisions in any additional agreements. If agreement requirements result in additional costs to the contract vendor, the contract vendor shall be entitled to direct reimbursement for these costs, in addition and separately to approved contract pricing. A copy of the additional member agreement shall accompany the member's purchase order.

**9. OFFEROR QUALIFICATIONS**

It is preferred that the offeror has extensive knowledge and at least three (3) years experience with the provision, installation and maintenance of the equipment and Job Order Contracting services offered. Mohave reserves the right to accept or reject newly-formed companies based solely on information provided in the proposal and/or its own investigation of the company.

**10. PRICING**

**10.1. Administration fee:** Mohave's 1% administration fee shall be included in offeror's contract price. Contract vendor shall not add the administration fee to approved contract prices. The value of trade-ins or rebates shall not affect the amount of administration fee paid to Mohave.

**10.2. Application of pricing:** In Mohave's purchase order review process, the date of a valid contract vendor's quote or the date Mohave receives a member purchase order will generally be used to determine the contract pricing that is in effect for that order. The date Mohave receives a member purchase order will only be used to determine the contract pricing that is in effect for an order when a contract vendor's quote does not exist or is invalid. However, other factors may apply.

**10.3. Basis for pricing:** Contract pricing under this RFP shall be based upon:

1. Coefficient applied to a UPB; or
2. Open Book Pricing; or
3. Discount applied to *Trade Service* price guides; or
4. A combination of the above.

**10.4. Coefficients:** A coefficient will be applied to the UPB. The coefficient is the multiplier (e.g., .95) that is applied to all UPB prices to determine the member's contract price. Several coefficients may apply to the UPB. Coefficients shall be extended no more than two (2) decimal places.

**10.5. Coefficients, quarterly updates:** Quarterly updates to the CCI shall be required under an awarded contract. Mohave shall set the schedule for allowable quarterly CCI updates.

**10.6. Decimal places:** Pricing shall use a maximum of two (2) decimal places.

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**Technical Proposal – Special Terms and Conditions**  
**(Place after Tab 1d)**

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**10.7. New price lists:** New price lists, and workbooks shall only be submitted for review at the renewal anniversary of the contract. Contract vendor shall be bound to the pricing methodologies submitted in the price proposal. Contract vendor shall not be allowed to add new pricing methodologies to their price proposal. Contract vendor will be allowed to remove pricing methodologies. Mohave will review new price lists, and/or workbooks to determine if the new prices or an alternative option is in the members' best interests. New price lists, and/or workbooks shall apply to the contract only upon approval from Mohave. New price lists, and/or workbooks found to be non-competitive at any time during the contract shall be grounds for terminating the contract.

**10.8. Open Book Pricing:** In addition to UPB-based pricing, Open Book Pricing may be used as an optional pricing method. Member shall select the pricing method for a job order prior to requesting a price quote. Once selected, the pricing method for the job order may not be changed. Open Book Pricing shall consist of direct job cost, project-specific general conditions, a fixed general and administrative cost multiplier, and a fixed profit multiplier. Bond cost and transaction privilege tax (sales tax) will be added to Open Book Pricing for total job order cost. The factors used in Open Book Pricing shall be consistent with the factors used in determining the UPB coefficient originally awarded in the contract.

Projects that include preconstruction services shall use the UPB pricing methodology as the basis for that pricing. For projects using these preconstruction services, both UPB and Open Book Pricing methodology may be used: UPB for the preconstruction portion, and Open Book for the rest of the project.

**10.9. Price reduction and adjustment:** Price reduction may be offered at any time during a contract and shall become effective upon notice of acceptance from Mohave. Special time-limited reductions are permissible under the following conditions: 1) reduction is available to all members equally; 2) reduction is for a specific time period, normally not less than thirty (30) days; 3) original price is not exceeded after the time-limit; and 4) Mohave has approved the new prices prior to any offer of the prices to a member. Mohave shall be the sole judge on the acceptance of price reductions under an awarded contract.

**10.10. Preferred order of pricing methodologies:** The preferred order of pricing for UPB and *Trade Service* pricing may be as follows:

- a. Coefficient applied to a UPB
- b. Coefficient applied to UPB labor and equipment. *Trade Service* product pricing for materials
- c. Coefficient applied to UPB labor, equipment, and non pre-priced item
- d. *Trade Service* product pricing and labor rate

**10.11. Reimbursement for transportation, mileage, lodging, meals and incidental expenses (M&IE):** Contract vendor may charge for transportation, mileage, lodging and M&IE costs for employees that are required to travel to perform services at member site under this contract. An overnight stay is required for lodging reimbursement. Mileage reimbursement shall be at a specified rate. Transportation charges are separate from mileage, and may include airfare, car rental, etc.

Reimbursements under this section shall not exceed the rates listed in approved pricing, and shall not exceed the actual charge. To be eligible for reimbursement, estimated charges must be on the quote and approved by the member. Receipts for such reimbursements must be provided upon request from the member.

**10.12. Promotional pricing offers:** Promotional pricing offers (e.g., quantity discounts, time sensitive offers, bundles) must apply to all Mohave orders of similar size and scope. Promotional pricing limited to a single member is not acceptable. Mohave must approve promotional pricing before it is offered to any member.

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**Technical Proposal – Special Terms and Conditions**  
**(Place after Tab 1d)**

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**10.13. Trade Service** The successful contract vendor shall reimburse Mohave the current subscription rate for a *Trade Service eDataFlex* pricing to facilitate eligible procurement agencies in placing orders. Contract vendor agrees to maintain their own subscriptions to *Trade Service eDataFlex* pricing to quote products under an awarded contract. The data contained in the *Trade Service eDataFlex* will be used to archive historical pricing information for Mohave staff to confirm pricing and perform audits under an awarded contract. Mohave will attempt to spread the costs for the *Trade Service eDataFlex* pricing between all contract vendors awarded a contract. Mohave shall invoice the contract vendor accordingly based on the number of awarded contracts using *Trade Service*. Travel/drive rates and/or mobilization may only be used with projects priced using *Trade Service* and labor. Mobilization charges shall not be allowed with UPB or Open Book Pricing methodologies.

**10.14. Unit price book:** Offeror shall provide the name and date of the unit price book to which the coefficient will be applied. Submission of outdated unit price books may result in rejection of the proposal.

**10.15. Unit price book copies:** The successful contract vendor shall be responsible for providing UPB pricing for Mohave's use. Mohave may require multiple copies of the UPB. Mohave will attempt to spread the costs for the UPB pricing between all contract vendors awarded a contract by purchasing the required pricing and invoicing the vendor, based on the modules used by each vendor.

## **11. SITE REQUIREMENTS**

**11.1. Cleanup:** Contract vendor shall clean up and remove all debris resulting from their work as required or directed by member. Upon completion of the work, the premises shall be left in good repair and unobstructed condition.

**11.2. Contract vendor employee fingerprinting:** Contract vendor and its employees or subcontractors working under an awarded contract who are required to provide services on a regular basis at an individual school, shall obtain and present a valid Department of Public Safety fingerprint clearance card in accordance with ARS §15-512(H). The fingerprint card shall be issued pursuant to Title 41, Chapter 12, Article 3.1. Charges for such fingerprint checks will be the responsibility of the contract vendor, subcontractor or individual employee as determined by the member.

An exception to this requirement may be authorized in member's Governing Board policy, for persons who, *"as part of the normal job duties of the persons, are not likely to have independent access to or unsupervised contact with pupils."*

Contract vendor and its employees or subcontractors shall not provide services on school district property until so authorized by the school district. Additionally, contract vendor shall comply with applicable governing board fingerprinting policy(ies) at the school district where services are provided.

**11.3. Onsite Contract Vendor Responsibilities:** The contract vendor is responsible for ensuring that all onsite work performed under this contract meets or exceeds the current OSHA standards, and is responsible for ensuring safe work performance of employees and subcontract vendors.

Contract vendor and its employees or subcontractors shall report accidents and incidents immediately to the member's responsible staff or its administration. The contract vendor is responsible for providing and obtaining appropriate medical and emergency assistance and notifying fire and law enforcement agencies, when necessary. Except for rescue and emergency measures, the scene of the accident or incident shall not be disturbed, and the operation shall not resume until authorized by the member's responsible staff or administration. The contract vendor must assist and cooperate fully with the investigation of the accident/incident and ensure availability of all information, personnel and data pertinent to the investigation.

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## Technical Proposal – Special Terms and Conditions (Place after Tab 1d)

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For preemptive purposes, contract vendor and its employees or subcontractors shall immediately report to the member's responsible staff or administration all areas of concern that could potentially lead to accident or injury.

**11.4. Preparation:** Contract vendor shall not begin a project for which member has not prepared the site. Site preparation includes, but is not limited to: moving furniture, installing wiring for networks or power, and similar pre-installation requirements.

**11.5. Registered sex offender restrictions:** For work to be performed at an Arizona school, contract vendor agrees that no employee or employee of a subcontractor who has been adjudicated to be a registered sex offender will perform work at any time when students are or are reasonably expected to be present. Contract vendor agrees that a violation of this condition shall be considered a material breach and may result in the cancellation of the purchase order at the member's discretion.

**11.6. Safety measures:** Contract vendor shall take all reasonable precautions for safety on the worksite, and shall erect and properly maintain all necessary safeguards for protection of workers and the public. Contract vendor shall post warning signs against all hazards created by its operation and work in progress. Proper precautions shall be taken pursuant to current Arizona law and standard practices to protect workers, general public, and existing structures from injury or damage.

**11.7. Smoking:** Persons working under the contract shall adhere to current local smoking policies.

**11.8. Stored materials:** Upon prior written agreement between the contract vendor and member, payment may be made for materials not incorporated in the work but delivered and suitably stored at the site or some other location, for installation at a later date. An inventory of the stored materials shall be provided to member prior to payment. Such materials shall be stored and protected in a secure location, and be insured for their full value by the contract vendor against loss and damage. Contract vendor agrees to provide proof of coverage and/or addition of member as an additional insured upon member's request. Additionally, if stored offsite, the materials shall also be clearly identified as property of member and be separated from other materials. Member shall be allowed reasonable opportunity to inspect and take inventory of stored materials, on or offsite, as necessary.

Payment for stored materials shall not constitute final acceptance of such materials. The contract vendor shall be responsible for the protection of all material and equipment, whether stored on or off site. Title for all work, materials and equipment shall pass to the member only upon final inspection and payment of remaining job costs.

### **12. SUBCONTRACTORS**

**12.1. Awarding subcontracts:** Offeror agrees that any subcontract competitively solicited by contract vendor will not be awarded solely upon membership or non-membership in a union or professional association.

**12.2. Entering subcontracts:** Subcontracts shall incorporate by reference the terms and conditions of the Mohave contract.

**12.3. Prime contractor:** Contract vendor will be considered a prime contractor and not a subcontractor. Neither Mohave nor the member will establish a contractual relationship with subcontractors.

**12.4. Subcontracts:** No subcontracts shall be entered into with any unlicensed party. Contract vendor must use subcontractors openly, include such arrangements in the proposal, and certify upon request that such use complies with the current rules of the Arizona Registrar of Contractors and the Arizona procurement rules and code. No subcontracting costs may be hidden in a cost proposal to member.

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**Technical Proposal – Special Terms and Conditions**  
**(Place after Tab 1d)**

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**12.5. Subcontractor payment:** Contract vendor agrees to pay subcontractors within seven days after receipt of payment from member, as required in Arizona procurement rules and code. If contract vendor receives any interest monies for delay of payment from member, contract vendor will pay subcontractor the correct proportion of interest received. Complaints by subcontractor may be resolved as described in Arizona procurement rules and code. Failure to pay subcontractor for work faithfully performed and properly invoiced may result in the suspension or cancellation of this contract.

**12.6. Selection Process for Subcontractors:** Contract vendor shall select subcontractors based on qualifications alone or on a combination of qualifications and price and shall not select subcontractors based on price alone.

**12.7. Use of subcontractors:** If the contract vendor subcontracts or intends to subcontract part or all of the work under a job order:

The contract vendor has a duty to deliver promptly to each subcontractor invited to bid a coefficient to the contract vendor to do all or part of the work under one or more job orders.

Provide a copy of the descriptions of all standard individual tasks and a copy of the applicable current standard unit prices on which the subcontractor is invited to bid.

### **13. TERM OF CONTRACT AND EXTENSION**

**13.1. Contract period:** It is Mohave's intent to award a multi-term contract for the specified product, material, process, or services. The initial contract term shall be for one (1) calendar year from the effective date of contract award. By mutual written agreement between Mohave and contract vendor, the contract may be extended for up to four (4) consecutive additional 12-month periods, beginning immediately after expiration of the prior term. However, no contract extension (contract modification) exists unless and until contract vendor is so notified by Mohave.

**13.2. Contract extension (contract modification):** Conditions for contract extension (contract modification) may include, but are not limited to: contract usage, satisfactory performance of services during the preceding contract term, ability to continue to provide satisfactory services, continued adherence to the contract requirements, and continued competitive prices for the materials and services provided under the contract. Mohave shall prepare a performance report for all contracts prior to issuing any extension (contract modification). This performance report shall use past performance information gathered by your assigned Contract Specialist. Past performance information shall be used when determining whether a contract receives an extension (contract modification).

**13.3. Month-to-month extensions (contract modification):** Mohave reserves the right to offer month-to-month extensions (contract modification), if that is determined to be in the best interests of members.

### **14. TRADE-IN EQUIPMENT**

Member and contract vendor shall determine values placed on trade-in products. The value of trade-in shall not affect the amount of administration fee paid to Mohave. Trade-in equipment shall be dismantled and removed at contract vendor's expense. The condition of trade-in equipment at the time it is turned over to contract vendor shall be the same as when the original agreement was made, except for normal wear and tear from use between the time of the offer and trade-in.

### **15. WARRANTY/QUALITY GUARANTEE**

**15.1. Extended warranties contracts:** The contract vendor or a manufacturer may offer extended warranties available at extra cost for members that agree to a maintenance contract. The extended warranty contract shall be offered as a separate line item. Upon request, training must be offered by the contract vendor for the maintenance staff of the member and will be arranged before installation as part of the purchase contract. This training shall be priced per contract pricing.

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**Technical Proposal – Special Terms and Conditions**  
**(Place after Tab 1d)**

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**15.2. Fitness:** Contract vendor warrants that any equipment or material supplied to Mohave or its members shall fully conform to all requirements of the contract, all representations of contract vendor, and shall be fit for all purposes and uses required by the contract.

**15.3. Inspection:** The warranties set forth in this section shall not be affected by inspection or testing of, or payment, for the product or materials to contract vendor by member.

**15.4. Quality:** Unless otherwise specified, contract vendor warrants that for a period of two (2) years after acceptance of the equipment or materials by member, they shall be:

- Of a quality to pass without objection in the industry or trade normally associated with them;
- Fit for the intended purpose(s) for which they are used;
- Of even kind, quantity and quality within each unit and among all units, within the variations permitted by the contract;
- Adequately contained, packaged and marked as the contract may require; and
- Conform to the written promises or affirmations of fact made by contract vendor.

**15.5. Warranty requirements:** Contract vendor warrants that all products, materials, processes and services delivered under this contract shall conform to the specifications. Unless stated otherwise, all equipment shall carry a minimum two (2) year warranty that includes parts and labor. Contract vendor agrees to help member reach resolution in a dispute with the manufacturer over warranty terms. Any extended manufacturer's warranty shall be passed on to member without exception. Mohave reserves the right to cancel the contract if contract vendor charges member for a replacement part that the contract vendor received at no cost under a warranty.

**15.6. Warranty work:** The contract vendor shall perform all warranty work and remain available to the member should continue service be required after warranty obligations are met.

**Technical Proposal – Special Terms and Conditions Acceptance Form**  
**(Place after Tab 1d)**

*Signature on Page 2 certifies complete acceptance of the Special Terms and Conditions in this solicitation, except as noted below (additional pages may be attached, if necessary).*

**Check one of the following responses to the Special Terms and Conditions:**

- We take no exceptions/deviations to the Special Terms and Conditions.**

*(Note: If nothing is listed below, it is understood that no exceptions/deviations are taken.)*

- We take the following exceptions/deviations to the Special Terms and Conditions. All exceptions/deviations shall be clearly explained. Reference the corresponding Special Terms and Conditions that you are taking exceptions/deviations to. Clearly state if you are adding additional terms and conditions to the Special Terms and Conditions. Provide details on your exceptions/deviations below:**

*(Note: All requested exceptions/deviations must be clearly explained. Reference the specific special terms and conditions that you are taking exceptions/deviations to, detail any proposed substitute special terms and conditions, and clearly demonstrate how Mohave and its membership will be better served by the substituted special terms and conditions. Unacceptable exceptions/deviations shall remove your proposal from consideration for award. Mohave shall be the sole judge on the acceptance of exceptions/deviations and Mohave's decision shall be final.)*

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## Technical Proposal – General Terms and Conditions (Place after Tab 1c)

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Some General Terms and Conditions specify placement of information in tabs other than Tab 1c as noted in the title above. Pay close attention to placement information (identified in bold text) as indicated in select General Terms and Conditions.

### **1. ADVERTISING**

Offeror shall not advertise or publish information concerning this solicitation prior to an award being announced by Mohave. After award, contract vendor(s) may advertise the availability of products, materials, processes and services to members. Any promotional marketing materials using the Mohave logo shall be approved by a Mohave Contract Specialist in advance.

### **2. AVAILABILITY OF FUNDS**

Member fund availability is unknown to Mohave at the time this solicitation was issued. Use of any contract awarded by Mohave will be conditioned upon the availability of member funds.

### **3. CANCELLATION**

**3.1. Cancellation Process:** The following requirements shall apply to all cancellation notices issued under an awarded contract:

- A written notice of cancellation shall be sent to the contract vendor and the effective date of cancellation shall be the date specified within the written notice of cancellation.
- Upon cancellation, all products, materials, processes and services paid for by the member, along with documents, data and reports prepared by contract vendor under the contract shall become the property of the member.
- Contract vendor shall be entitled to receive just and equitable compensation in accordance with applicable contract pricing for authorized work in progress, authorized work completed and materials accepted before the effective date of the cancellation.
- Cancellation shall have no effect on projects in progress prior to the effective date of the cancellation.
- Contract vendor is obligated to continue submitting monthly reconciliation reports and administrative fee payments until all purchases are complete and closed.

**3.2. Cancellation for bankruptcy or acquisition:** Mohave reserves the right to cancel, or suspend the use of, any contract if contract vendor files for bankruptcy protection, or if the original contract holder is sold and ownership is transferred to a new party.

**3.3. Cancellation for conflict of interest:** Mohave may cancel this contract pursuant to ARS §38-511 for conflict of interest. Conflict of interest occurs if any person significantly involved in initiating, negotiating, securing, drafting or creating the contract on behalf of Mohave, is or becomes at any time while the contract or an extension (contract modification) of the contract is in effect, an employee of, or a consultant to, any other party to the contract, with respect to the subject matter of the contract. Members shall incur no penalty or further obligation if the contract is cancelled for conflict of interest.

**3.4. Cancellation for convenience:** Mohave reserves the right to immediately cancel the contract without penalty or recourse, in whole or in part, when Mohave determines that action to be in the best interests of its members.

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**Technical Proposal – General Terms and Conditions**  
**(Place after Tab 1c)**

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**3.5. Cancellation for non-performance or contract vendor deficiency:** Mohave may terminate any contract if members have not used the contract, or if purchase volume is determined to be “low volume” in any 12-month period. Mohave reserves the right to cancel the whole or any part of this contract due to failure by contract vendor to carry out any obligation, term or condition of the contract. Mohave may issue a written deficiency notice to contract vendor for acting or failing to act in any of the following:

- Failing to comply with the accepted terms and conditions of the contract;
- Providing material that does not meet the specifications of the contract;
- Providing work and/or material that was not awarded under the contract;
- Failing to adequately perform the services set forth in the scope of work and specifications;
- Failing to complete required work or furnish required materials within a reasonable amount of time;
- Failing to make progress in performance of the contract and/or giving Mohave reason to believe that contract vendor will not or cannot perform the requirements of the contract
- Failing to provide required performance bonds;
- Performing work or providing services under the contract prior to receiving a Mohave reviewed member purchase order for such work.

Upon receipt of a written deficiency notice, contract vendor shall have ten (10) days to provide a satisfactory response to Mohave to adequately address all issues of concern. Failure to adequately address all issues of concern may result in contract cancellation. Upon cancellation under this clause, all goods, materials and work paid for by the member, along with documents, data and reports prepared by contract vendor under the contract shall become the property of the member.

**3.6. Cancellation for replacement:** Mohave reserves the right to cancel a contract awarded under this solicitation, if a new solicitation has been issued and a contract has been awarded to the same contract vendor for similar products, materials, processes and services. Mohave may, at its option, either replace a contract resulting from this solicitation or delay a new award until the existing contract expires. The decision to delay or replace the contract rests solely with Mohave.

**3.7. Contract vendor cancellation:** Contract vendor may cancel this contract at any time upon thirty (30) days prior written notice to Mohave or at time of annual contract renewal (contract modification). Termination shall have no effect on projects in progress at the time the notice of cancellation is received by Mohave.

**3.8. Continuation of performance:** Contract vendor shall continue to perform in accordance with the requirements of the contract, up to the date of cancellation and as directed in the cancellation notice.

**3.9. Gratuities:** Mohave shall cancel this contract if it is found that gratuities in the form of entertainment, gifts or otherwise, were offered or given by contract vendor or any agent or representative of contract vendor, to any employee of Mohave or member with a view toward securing a contract or with respect to the performance of this contract. Officers, employees and agents are prohibited from soliciting or accepting gratuities, favors or anything of monetary value from contractors or parties of subcontractors under an awarded contract. Paying the expenses of normal business meals shall be in accordance with each member’s policy regarding gratuities. Samples as requested in the solicitation and provided to Mohave for demonstration or evaluation are not considered gratuities.

**4. CAPTIONS, HEADINGS AND ILLUSTRATIONS**

The captions, illustrations, headings, and subheadings in this solicitation are for convenience and ease of perusal only, and in no way define, limit or describe the scope or intent of the request.

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**Technical Proposal – General Terms and Conditions**  
**(Place after Tab 1c)**

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**5. CERTIFICATION**

By signing the *Offer and Acceptance Form* (page 2 of the RFP), offeror certifies the following:

- Offeror has examined and understands the terms, conditions, scope of work, specifications and other documents in this solicitation.
- The submission of the proposal did not involve collusion or other anticompetitive practices. Neither signatory nor any person on his behalf has connived or colluded to produce a deceptive show of competition in the matter of the bidding or award of a contract under this solicitation.
- Offeror has not given, offered to give, nor intends to give at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a public servant in connection with the submitted offer.
- Neither offeror, nor any officer, director, partner, member or associate of offeror, nor any of its employees directly involved in obtaining contracts with the State of Arizona, Mohave Educational Services Cooperative, Inc., or any subdivision of the state has been convicted of false pretenses, attempted false pretenses, or conspiracy to commit false pretenses, bribery, attempted bribery or conspiracy to bribe under the laws of any state or federal government for acts or omissions after January 1, 1985.
- Offeror agrees to comply fully with any and all provisions of ARS Title 32, Chapter 10 (Registrar of Contractors) that may regulate offeror's business.
- Offeror shall not discriminate against any employee, or applicant for employment, in violation of federal and state laws (see Federal Executive Order 11246; and ARS Title 41, Chapter 9, Article 4).
- Offeror is not currently suspended, debarred or otherwise precluded from participating in any public procurement activity with any federal, state or local government entity.
- If awarded a contract, offeror agrees to promote, offer and sell under Mohave contract only those materials and/or services awarded to contract vendor by Mohave.
- If awarded a contract, offeror shall provide the equipment, commodities, and/or services to members of Mohave in accordance with the terms, conditions, scope of work, specifications, and other documents of this Request For Proposal.
- If awarded a contract, offeror agrees that all staff and other individuals eligible to receive services shall have equal access to the services regardless of race, religion, color, sex, disability, age or national origin (including language minority individuals).
- Offeror and all proposed subcontractors comply and shall remain in compliance with the Federal Immigration and Nationality Act (FINA), all other federal immigration laws and regulations, ARS §41-4401, and ARS §23-214, which requires compliance with current federal immigration laws by Arizona employers, Arizona contractors and Arizona subcontractors in accordance with the E-Verify employee eligibility verification program.
- Offeror shall comply with ARS §35-393.01 and certify that they are not currently engaged in, and agree that for the duration of the contract to not engage in, a boycott of Israel. **(Note: Unless and until the District Court's injunction in *Jordahl v. Brnovich et al.*, Case No. 3:17-cv-08263 (D. Ariz.) is stayed or lifted, the Anti-Israel Boycott Provision (A.R.S. 35-393.01 (A)) is unenforceable and will take no action to enforce it. Compliance to this term and condition is not a mandatory part of the offer as long as the injunction remains in place. Offers will not be evaluated based on whether the offeror complied or deviated to this term and condition.)**
- If applicable to the products and services offered under this contract, Offeror shall comply with current applicable requirements of Health Insurance Portability and Accountability Act of 1996 (HIPPA), and accompanying regulations. Contract vendor agrees to work with the member in the course of performance so that the member and contract vendor are in compliance with HIPPA.

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**Technical Proposal – General Terms and Conditions**  
**(Place after Tab 1c)**

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**6. CONFIDENTIAL INFORMATION**

**6.1. Confidential information request:** If offeror believes that its proposal contains confidential trade secrets or other proprietary data not to be disclosed, a statement advising Mohave of this fact shall accompany the proposal, and the information shall be so identified wherever it appears. Mohave shall review the statement and notify the offeror of their determination in writing whether the information shall be withheld or disclosed. Requests to deem the entire proposal as confidential will not be considered.

**6.2. Pricing:** Mohave will not consider pricing to be confidential or proprietary.

**6.3. Public record:** All proposals submitted in response to this solicitation shall become the property of Mohave. They will become a matter of public record available for review, subsequent to award of all multiple contracts, with the exception of information deemed confidential by Mohave.

**7. CONFIRMATION**

If an apparent mistake in a proposal, relevant to the award determination is discovered after opening and before award, Mohave shall contact the offeror for written confirmation of the proposal. If offeror fails to act, the offeror shall be considered non-responsive.

Mohave may contact an offeror to confirm our understanding of the proposal. Such contact shall be prior to award. Mohave shall obtain written confirmation from the offeror and shall retain the confirmation in the procurement file. Correction of mistakes in a proposal shall only be allowed as described in Arizona procurement rules and code.

**8. CONTRACT MANAGEMENT**

**8.1. Applicable law:** The contract shall be governed by the laws of the State of Arizona, and suits pertaining to the contract may be brought only in courts in the State of Arizona.

**8.2. Application of law:** The Arizona Procurement Code, the Arizona State Board of Education School District Procurement Rules, and the Uniform Commercial Code (UCC) as adopted by the State of Arizona, are part of this document as if fully set forth herein. Any provision or clause required by law, rule or regulation to be included in the contract will be read and enforced as if in the contract, whether or not physically included. If any such provision is not included, or is not correctly included, contract will be amended in writing to make such inclusion or correction upon application from either party to contract.

**8.3. Arbitration:** After exhausting applicable administrative review, the parties to this contract may agree to resolve disputes arising out of or relating to this contract through arbitration, to the extent allowed by law.

**8.4. Assignment:** Contract vendor shall assign no right or interest in this contract without prior written permission from Mohave. No delegation of any duty of contract vendor shall be made without prior written permission from Mohave. Mohave shall not unreasonably withhold approval and shall notify contract vendor of its decision within fifteen (15) days of receipt of written notice from contract vendor.

**8.5. Contract claims or controversies:** The requirements of the Arizona procurement rules and code shall govern any contract awarded as a result of this solicitation, as well as any contract claims or controversies associated with it.

Formal contract claims and controversies between a member and contract vendor shall be resolved in accordance with R7-2-1155 through R7-2-1159, or ARS, Title 41, Chapter 23, Article 9, as applicable. The member's authorized representative shall serve as the district representative for resolution of such claims and controversies. ARS, Title 41, Chapter 23, Article 9 and the rules promulgated under it, or R7-2-1155 through R7-2-1159, as applicable, provide the exclusive procedure for asserting a cause against the member under the contract.

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**Technical Proposal – General Terms and Conditions**  
**(Place after Tab 1c)**

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**8.6. Contract placed on hold:** Mohave shall have the ability to place a contract on hold, if it is deemed necessary to address ongoing problems with an awarded contract. Details of the decision to place the contract on hold shall be provided in a written deficiency notice. A reasonable amount of time shall be provided to contract vendor to address issues in the written deficiency notice.

**8.7. Modification of contract:** An awarded contract may be modified for a variety of reasons. Contract modifications will be issued as deemed necessary by Mohave to address contractual issues that may arise.

**8.8. Novation:** If contract vendor sells or transfers all assets or the entire portion of the assets used to perform this contract, a successor in interest must guarantee to perform all obligations under this contract. Mohave reserves the right to accept or reject any new party. A simple change of name agreement will not change the contractual obligations of contract vendor.

**8.9. Order cycle overview:**

One, or both, of the following order cycles will apply to an awarded contract. A sample reconciliation report will be provided to contract vendors who have been awarded a contract. Instructions for filling out the purchase order, or Pcard process, will be contained in that sample reconciliation report.

**For Procurements made with purchase orders:**

1. Member forwards purchase orders to Mohave that lists the contract number, along with a copy of detailed contract vendor quote. Vendor listed on the purchase order is contract vendor.
2. Mohave reviews and emails member order with "*MESC Reviewed*" stamp, to contract vendor and member.
3. Contract vendor provides product/services.
4. Contract vendor invoices member.
5. Member pays contract vendor.
6. Contract vendor sends monthly Reconciliation Report to Mohave.
7. Contract vendor remits administration fee monthly, based on invoices paid.
8. Mohave audits selected invoices.

**For Procurements made with Pcards:**

1. Member purchases directly from contract vendor using a Pcard and forwards a copy of detailed contract vendor quote to Mohave (if applicable).
2. Mohave reviews and emails contract vendor quote with "*MESC Reviewed*" stamp, to contract vendor and member (if applicable).
3. Contract vendor provides product/services.
4. Contract vendor invoices member (if not previously paid with Pcard).
5. Member pays contract vendor (if not previously paid with Pcard).
6. Contract vendor sends monthly Reconciliation Report and copy of detailed Pcard transaction, invoice or quotation to Mohave.
7. Contract vendor remits administration fee monthly, based on Pcard purchases paid.
8. Mohave audits selected Pcard purchases.

**8.10. Overcharges by antitrust violations:** Mohave maintains that overcharges resulting from antitrust violations are borne by the purchaser. Therefore, to the extent permitted by law, contract vendor assigns to member any and all claims for such overcharges as to the products, materials, processes or services used to fulfill the contract.

**8.11. Relationship of the parties:** Vendors receiving contracts under this solicitation are independent contractors. Any party to the contract shall not be deemed to be the employee of another party to the contract.

**8.12. Severability:** The provisions of this contract are severable to the extent that any provision or application held to be invalid shall not affect any other provision or application of the contract which may remain in effect without the invalid provision or application.

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**Technical Proposal – General Terms and Conditions**  
**(Place after Tab 1c)**

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**8.13. Successful performance:** The sections of the solicitation defining the scope of services, requirements, or qualifications are not to be construed as a complete listing that exempts successful offeror from reasonable services required to ensure successful performance under the contract.

**9. COOPERATIVE PURCHASING**

**9.1. Cooperative purchasing:** This contract is based on the need for Mohave to provide the economic benefits of volume purchasing and reduction in administrative costs through cooperative purchasing to members. Any offer that prohibits to specific types of members (e.g., state agencies or local government units) may not be considered. Sales without restriction to any members are preferred.

**9.2. Cooperative purchasing agreements:** Cooperative Purchasing Agreements between Mohave and its members have been established under Arizona procurement rules and code for use of contracts.

**9.3. Most favored customer relationship:** Nothing in this solicitation is intended to establish a most favored customer relationship between Mohave and contract vendor. Contract vendor may respond to any solicitation without regard to this contract. Offeror agrees all prices, terms, warranties, and benefits granted by offeror to members through this contract are comparable to or better than the equivalent terms offered by offeror to any present customer meeting the same qualifications or requirements. If contract vendor offers lower prices to any of its other customers, it may lower its prices to Mohave at the same time by written notice.

**9.4. Eligible agencies:** Any contract awarded from this solicitation shall be available to all Mohave members. Members shall have a current signed Mohave Cooperative Purchase Agreement. Member is defined as a local or public procurement unit, or a governmental public entity that is a political subdivision for purposes of federal income tax, or a nonprofit educational or public health institution that is a political subdivision for purposes of federal income tax or meets the requirements of Section 115 of the Internal Revenue Code. Mohave has approximately 450 members including public school districts, community colleges, city and county governments and political subdivisions throughout Arizona. A list of members may be found on Mohave's website, [www.mesc.org](http://www.mesc.org). Actual use of any contract shall be at the sole discretion of Mohave's members.

**10. ESTIMATED QUANTITIES**

Mohave anticipates considerable activity resulting from this solicitation. An estimate of purchases is provided in the Scope of Work (page 8) of the requested materials or services. However, no commitment of any kind is made concerning quantities to be acquired. Mohave does not guarantee usage. Usage depends on the actual needs of members and marketing by contract vendor.

**11. EVALUATION and AWARD**

**11.1. Basis of award:** In accordance with Arizona Administrative Code, Article 11: School District Procurement R7-2-1111(J), ARS §34-604(F)(9) and §41-2579(F)(9), award(s) will be made to the responsive and responsible offeror(s) whose proposal(s) receive the highest score(s) under the method of scoring in the RFP. To qualify for evaluation, a proposal must have been submitted on time, and materially satisfy all mandatory requirements identified in this document.

**11.2. Competitive range:** Mohave reserves the right to establish a competitive range of acceptable proposals as part of the evaluation process. Proposals not in the competitive range are unacceptable and will not receive further award consideration.

**11.3. Exceptions/deviations to requirements:** All requested exceptions/deviations must be clearly explained. Unacceptable exceptions/deviations shall remove your proposal from consideration for award. Mohave shall be the sole judge on the acceptance of exceptions/deviations and Mohave's decision shall be final.

**11.4. Effect of price:** No contract shall be awarded solely on the basis of price.

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**(Place after Tab 1c)**

**11.5. Evaluation criteria:** The evaluation criteria for this solicitation, and the maximum points for each, are as follows:

<b>Criteria</b>	<b>Points</b>
<b>Technical Proposal Evaluation</b>	
Offeror’s qualifications and experience	40
Quality of the technical proposal (including all required documents)	20
Offeror’s contract management plan	10
Offeror’s quality management plan	10
Offeror’s subcontractor management plan	5
Offeror’s safety plan and record	5
Offeror’s financial capacity	5
References, past performance information and other pertinent information	5
<b>Technical Proposal Total</b>	<b>100</b>
<b>Price Proposal Evaluation</b>	
Cost (Coefficients, and Open Book Rates, <i>Trade Service</i> if offered)	65
Other appropriate evaluations described in R7-2-1046: Travel; meals and incidental expenses (M&IE); transportation costs; energy costs; ownership costs; life cycle costs	10
<b>Price Proposal Total</b>	<b>75</b>
<b>Grand Total</b>	<b>175</b>

**11.6. Evaluation process:** Before opening any price proposal, the selection committee shall open and separately evaluate the final technical proposals and score the final technical proposals using the scoring method in this Request for Proposal. No other factors or criteria shall be used in evaluation and scoring. After completion of the evaluation and scoring of all final technical proposals, the selection committee shall open, evaluate and score the price proposals, and complete scoring of the entire proposal using the scoring method in this Request for Proposal. No other factors or criteria shall be used in evaluation and scoring.

Mohave reserves the right to use a ranking system (the Heisman scoring method) for determining the final ranking of proposals. Each evaluator shall calculate their total assigned points for each proposal, applying a ranking of 1 to their highest score, a 2 to their next highest score, and so forth for all proposals. Each proposal shall have a final calculated rank determined by averaging each applied individual evaluator rank. Any final calculated rank ties shall be broken by using the grand total points (total of all evaluator assigned point totals for each proposal) for each of the tied proposals.

**11.7. Formation of contract:** A response to this solicitation is an offer to contract with Mohave based upon the terms, conditions, scope of work, specifications and amendment(s) contained in this request. A proposal does not become a contract unless and until Mohave accepts it. A contract is formed when a Mohave administrator signs the award document.

**11.8. Maximum job order:** The maximum dollar amount of an individual job order shall be one million dollars or such higher or lower amount prescribed by the purchasing agency in an action noticed pursuant to Title 38, Chapter 3, Article 3.1 or a rule adopted by the purchasing agency as the maximum amount of an individual job order. Requirements shall not be artificially divided or fragmented in order to constitute a job order that satisfies this requirement.

**11.9. Method of evaluation:** Mohave shall select a selection committee of not more than seven (7) members to evaluate the statement of qualifications. Composition of the selection committee shall be in compliance with Arizona Administrative Code, Article 11: School District Procurement R7-2-1107, ARS §34-604(C)(3) and §41-2579(C)(3).

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**11.10. Multiple award:** To assure that our contracts meet the requirements of all members, Mohave may award up to five contracts to individual firms receiving the highest number of points, for General Contracting and similar job-order-contracting construction services within specialty Division 22, Plumbing; Division 23, Heating, Ventilation and Air Conditioning; or Division 26, Electrical. Each of the multiple contracts will be awarded to a separate person/firm. Offeror should consider this fact in preparing their response. The decision to award multiple contracts, award a single contract, or make no award rests solely with Mohave.

Mohave is stating that three specialty contracting divisions will be considered beyond general contracting. Of these possible twenty contracts no more than five contracts will be awarded per division for multiple contracts for similar job order contracting construction services to separate persons/firms.

A multiple award shall be made only if the procurement officer determines in writing that a multiple award is necessary and is advantageous to Mohave members. A multiple award shall be limited to the least number of contracts necessary to meet the requirements of the using agencies. Mohave shall make the sole determination of the least number of contracts required to meet the need. Mohave's basis for determining whether to award multiple contracts shall be based upon considerations for the large number of members, diverse types of members, location of members throughout Arizona and members' past usage of similar contracts.

Criteria for selecting vendors for multiple contracts shall be based upon considerations for members' experience with existing products and systems, brand continuity for parts replacement and future expansion, contract vendor's ability to provide for our large, diverse membership, Mohave's past experience with contracts for similar product/services, and/or other relevant criteria.

**11.11. Non-exclusive contract:** Any contract resulting from this solicitation shall be awarded with the understanding and agreement that it is for the sole convenience of Mohave's members. Mohave and its members reserve the right to obtain like goods and services from other sources.

**11.12. Past performance information:** Past Performance Information (PPI) is relevant information regarding a contract vendor's actions under previously awarded contracts to public agencies. It includes contract vendor's record of performance under such contracts including, but not limited to: conformance to the terms, conditions, specifications and scope of work of the contracts, responsiveness to, and correction of, contract claims and controversies, and satisfaction of the contracting entities. PPI shall be a factor in evaluation and award.

**11.13. Price workbook:** All offerors shall submit their price proposal in paper, and in an electronic format. Provide a CD, USB, or similar electronic media device with the completed price proposal in your response. ***Place within your separately submitted price proposal.***

If awarded a contract, all future pricing updates shall be based on the electronic workbook, or similar approved format.

**11.14. Pricing extension errors:** In case of error in extension of prices in the proposal, unit prices shall govern.

**11.15. Reasonably susceptible of being awarded:** A proposal is acceptable if it is determined to be reasonably susceptible of being awarded a contract in accordance with the evaluation criteria and a comparison and ranking of original proposals. Proposals to be considered reasonably susceptible of being awarded a contract shall, at a minimum, demonstrate the following:

- Affirmative compliance with mandatory requirements designated in this solicitation.
- An ability to deliver goods or services on terms advantageous to members sufficient to be entitled to continue in the competition.
- That the proposal is technically acceptable as submitted.

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**11.16. Responsible offeror:** A responsible offeror is a firm or person who at the time of contract award has the capability to perform the contract requirements and the integrity and reliability that will assure good faith performance. Mohave shall determine an offeror to be responsible before awarding a contract to offeror.

**11.17. Responsive proposals:** A responsive proposal conforms in all respects to the material requirements of the solicitation. Proposals must be responsive to receive award consideration. Mohave reserves the right to waive minor informalities.

**11.18. Total costs:** Total member costs include energy, facilities, repair costs, present values of money, contract vendor charges, personnel costs and all other identifiable member costs. Contract vendor charges include all the costs of contract vendor support, materials, transportation and all other identifiable costs associated with the proposal.

*Contract vendor costs means the costs of all hardware, materials, software, transportation, contract vendor support and all other identifiable costs associated with the proposal.*

*Contract vendor support means services provided by the contract vendor, such as consulting, education, training, management of the system purchased and other integration and maintenance support.*

## **12. FEDERAL and STATE REQUIREMENTS**

**12.1. Affordable Care Act requirements:** Contract vendor understands and agrees that it shall be solely responsible for compliance with the Patient Protection and Affordable Care Act, Public Law 111-148 and the Health Care Education Reconciliation Act, Public Law 111-152 (collectively the Affordable Care Act "ACA"). Contract vendor shall bear sole responsibility for providing health care benefits for its employees who provide services to the member as required by state or federal law.

**12.2. Audit rights:** In accordance with applicable Arizona law, contract vendor's and subcontractor's books and records related to this contract may be audited at a reasonable time and place, for five years after completion of the contract.

**12.3. Clean Air Act, Clean Water Act and Environmental Protection Agency Regulations:** Contract vendor and its subcontractors shall comply with all applicable standards, orders or requirements issued under section 306 of the Clean Air Act, section 508 of the Clean Water Act, Executive Order 11738 and Environmental Protection Agency regulations (7 CFR 3016.36 (i) (12)). This shall only apply to federally funded projects subject to the Clean Air Act, Clean Water Act and current applicable EPA regulations.

**12.4. Compliance with federal and state requirements:** Contract vendor agrees, when working on any federally assisted projects with more than \$2,000 in labor costs, to comply with the Contract Work Hours and Safety Standards Act, the Davis-Bacon Act, the Copeland "Anti-Kickback" Act, the Housing and Urban Development Act of 1968, the Equal Opportunity Employment requirements as amended by Executive Order. In such projects, contract vendor agrees to post wage rates at the work site and submit a copy of their payroll to the member for their files.

In addition, to comply with the Copeland Act, contract vendor must submit weekly payroll records to the member. Contract vendor must keep records for three years and allow the federal grantor agency access to these records, upon demand. Contract vendor also agrees to comply with State of Arizona Executive Order 75-5, as amended by Executive Order 99-4.

When working on any projects funded with federal grant monies, contract vendor agrees to comply with the administrative requirements for grants and cooperative agreements to state, local and federally recognized Indian tribal government contract provisions.

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The forms listed below are incorporated by reference into this solicitation and any resultant contract.

- HUD-5369, Instructions to Offerors for Contracts, Public and Indian Housing Programs
- HUD-5369-A, Representations, Certifications, and Other Statements of Offerors, Public and Indian Housing Programs
- HUD-5369-B, Instructions to Offerors Non-Construction
- HUD-5369-C, Certifications and Representations of Offerors Non-Construction Contract
- HUD-5370, General Conditions of the Contract for Construction
- HUD-5370-C1, General Conditions for Non-Construction Contracts Section 1 (With or Without Maintenance Work)
- HUD-5370-C2, General Conditions for Non-Construction Contracts Section 1 (With Maintenance Work)

For federally funded projects only, the requirements of an applicable form shall supersede conflicting requirements in this solicitation. The forms may be accessed via HUDClips (<http://www.hud.gov>).

**12.5. Compliance with workforce requirements:** Pursuant to ARS §41-4401, contract vendor and subcontractor(s) warrant their compliance with all federal and state immigration laws and regulations that relate to their employees, and compliance with ARS §23-214 subsection A, which states, "...every employer, after hiring an employee, shall verify the employment eligibility of the employee through the E-Verify program." [To register for E-Verify, go to: <https://e-verify.uscis.gov/enroll/startpage.aspx>.]

Mohave reserves the right to cancel or suspend the use of any contract for violations of immigration laws and regulations. Mohave and its members reserve the right to inspect the papers of any contract vendor or subcontract employee who works under this contract to ensure compliance with the warranty above.

**12.6. Contract vendor employee work eligibility:** By entering into the contract, contract vendor warrants compliance with ARS §41-4401, ARS §23-214, the Federal Immigration and Nationality Act (FINA), and all other current federal immigration laws and regulations. Mohave and/or Mohave members may request verification of compliance from any contract vendor or subcontractor performing work under this contract. Mohave and its members reserve the right to confirm compliance. Should Mohave or its members suspect or find that the contract vendor or any of its subcontractors are not in compliance, Mohave may pursue any and all remedies allowed by law, including, but not limited to suspension of work, termination of the contract for default, and suspension and/or debarment of the contract vendor. All costs necessary for compliance are the responsibility of the contract vendor.

**12.7. Davis-Bacon wage decisions:** For federally funded projects subject to the Davis-Bacon Act, the member shall specify the applicable Davis-Bacon wage decision, prior to the contract vendor providing a firm price quotation for the proposed project. The wage decision shall be identified by the WD Number, modification number, and date of the wage decision. Davis-Bacon wage decisions may be accessed via [www.wdol.gov](http://www.wdol.gov) or by requesting a copy from the member.

**12.8. Energy Policy and Conservation Act:** Contract vendor and its subcontractors shall comply with mandatory standards and policies relating to energy efficiency (7 CFR 3016.36 (i) (13)). This shall only apply to federally funded projects subject to current applicable energy policies and the Energy Conservation Act.

**12.9. Non-compliance:** All federally assisted contracts with members that exceed \$10,000 may be terminated by the federal grantee for noncompliance by contract vendor. In projects that are not federally funded, offeror must agree to meet any federal, state or local requirements, as necessary. In addition, if compliance with the federal regulations increases the contract costs beyond the agreed on costs in this solicitation, the additional costs may only apply to the portion of the work paid by the federal grantee.

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**12.10. Offshore performance of work prohibited:** Due to security and identity protection concerns, direct services under this contract shall be performed within the borders of the United States. Any services that are described in the specifications or scope of work that directly serve the State of Arizona or its clients and may involve access to secure or sensitive data or personal client data or development or modification of software for the state shall be performed within the borders of the United States. Unless specifically stated otherwise in the specifications, this definition does not apply to indirect or 'overhead' services, redundant back-up services or services that are incidental to the performance of the contract. This provision applies to work performed by subcontractors at all tiers.

**12.11. Procurement of recovered material:** Contract vendor and its subcontractors shall comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, as stated in 2 CFR 200.321.

**12.12. Rights to inventions:** Rights to inventions made under a contract or agreement as specified under Appendix II to 2 CFR shall apply for federally funded projects.

**12.13. Subcontracts:** Prime Contractor, if subcontracts are to be let, will allow all business to have an equal opportunity to sign up as a prospective bidder for work assigned under this contract.

**12.14. Terrorism country divestments:** In accordance with ARS §35-392, Mohave and its members are prohibited from purchasing from a company that is in violation of the Export Administration Act. By entering into the contract, contract vendor warrants compliance with the Export Administration Act.

**12.15. Compliance to USDA solicitation requirements:**

- Offeror certifies that all pricing in their proposal has been arrived at independently, without consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other offeror or with any competitor certification regarding non-collusion.
- Offeror agrees to comply fully with U.S. Department of Agriculture, the Arizona Department of Education, U. S. Accounting Office, or any of their duly authorized representative to allow access to any books, documents, papers, and records of the offeror, which are directly pertinent to the specific contract, for the purpose of audits, examinations, excerpts, and transcriptions. Additionally, the offeror shall provide all documents as necessary for the independent auditor to conduct the school food authority (SFA) single audit (if applicable). In the event of any unresolved audit findings, the records shall be retained beyond the five (5) year period for as long as required for resolution of these issues raised by the audit.
- Offeror agrees to comply with all mandatory standards and policies relating to energy efficiency as cited in the State Energy Conservation Plan issued in compliance with the Energy Policy and Conservation Act (Public Law 94-163).
- Offeror shall comply with Executive Order 11246, entitled Equal Employment Opportunity, as amended by Executive Order 11375 of October 13, 1967, and as supplemented in Department of Labor regulations, 41 CFR Part 60 3016.36(i)(3).
- Offeror shall comply with the following civil rights laws as amended: Title VI of the Civil Rights Act of 1964; Title IX of the Education Amendments of 1972; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975; Department of Agriculture regulations on nondiscrimination 7 CFR 210.23 (b); Title 7 CFR parts 15, 15a, and 15b; the Americans with Disabilities Act; and the FNS Instruction 113-6; "Civil Rights Compliance and Enforcement in School Nutrition Programs".
- Offeror shall comply with the provisions of the Consumer Product Safety Act.

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- Offeror shall disclose all discounts, rebates, allowances and incentives received by the offeror from its suppliers. If the offeror receives a discount, rebate, allowance, or incentive from any supplier, the offeror shall disclose and return to the SFA, (if applicable), the full amount of the discount, rebate, or applicable credit that is received based on the purchases made on behalf of the SFA. The offeror shall identify the amount of each discount, rebate and other applicable credit on bills and invoices presented to the SFA for payment and individually identify the amount as a discount, rebate, or in the case of other applicable credits, the nature of the credit according to 7 CFR 210.21(f)(1)(iv).
- Offeror shall agree no expenditure may be made from the nonprofit school food service account for any cost resulting from a procurement failing to meet the requirements of the requirements for prohibited expenditures or as required in 7 CFR §210.21 or 7 CFR §210.21(f)(2).

### **13. FORCE MAJEURE**

Except for payments of sums due, neither party shall be liable to the other, nor be deemed in default under this contract, if and to the extent that such party's performance of this contract is prevented by reason of force majeure. The term "force majeure" means an occurrence that is beyond the control of the party affected and occurs without its fault or negligence, including, but not limited to the following: acts of God (e.g. fire, flood, snow, earthquakes, tornadoes, violent winds, hail storms); acts of the public enemy; war; riots; strikes; mobilization; labor disputes; civil disorders; lockouts; injunctions-intervention-acts, or failures or refusals to act by government authority; and other similar occurrences beyond the control of the party declaring force majeure, which such party is unable to prevent by exercising reasonable diligence. The force majeure shall be deemed to commence when the party declaring it notifies the other party of the existence of the force majeure, and shall be deemed to continue as long as the results or effects of the force majeure prevent the party from resuming performance in accordance with the contract. Force majeure shall not include late deliveries of equipment or materials caused by congestion at a manufacturer's plant or elsewhere, an oversold condition of the market, inefficiencies, or similar occurrences. If either party is delayed at any time by force majeure, the delayed party shall notify the other party in writing of such delay within forty-eight (48) hours.

### **14. INDEMNIFICATION**

**14.1. General indemnification:** To the extent permitted by law, Mohave and its members shall be indemnified and held harmless by contract vendor for its vicarious liability as a result of entering into this contract. Each party to the contract is responsible for its own negligence. Contract vendor agrees to save and hold harmless Mohave and/or its members from any and all liability for loss or damage to persons or property arising out of the work required by the contract. Contract vendor further agrees to waive any right of recovery against Mohave and/or its members for damage to the property of contract vendor, whether caused by negligence on the part of Mohave and/or its members or otherwise. This provision includes specifically the waiver of right of recovery against Mohave and/or its members for damage to property under contract and not yet formally accepted by member even though said property at the time of loss may be occupied, in whole or in part, by member.

**14.2. Modification by member:** Contract vendor shall have no obligation with respect to any patent and copyright infringement claim based upon member's modification of the equipment and/or software, or its operation or use with apparatus, data or programs not furnished by contract vendor. However, one member's action will not preclude contract vendor's obligation to members who have not modified their equipment or software.

**14.3. Patent and copyright indemnification:** To the extent permitted by law, contract vendor shall indemnify and hold harmless Mohave and its members against any liability, including costs and expenses, for infringement of any patent, trademark or copyright arising out of contract performance or use by Mohave and its members of materials furnished or work performed under this contract. Mohave and its members shall reasonably notify contract vendor of any claim for which it may be liable under this paragraph.

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**15. INTERVIEWS**

After receipt and opening of preliminary technical proposals, Mohave will not hold interviews during the evaluation of this RFP.

**16. LICENSES**

In accordance with the Arizona Administrative Code, Article 11: School District Procurement R7-2-1112(A)(2), ARS §34-605(E)(2) and §41-2580(E)(2): The contractor is required to be licensed to perform construction.

A contract vendor shall maintain in current status all federal, state and local licenses, bonds and permits required for the operation of the business conducted by contract vendor. The contract vendor shall remain fully informed of and in compliance with all current ordinances and regulations pertaining to the lawful provision of services under the contract. Mohave reserves the right to stop work and/or cancel the contract of any contract vendor whose license(s) expire, lapse, are suspended or terminated. Contact vendor shall immediately notify Mohave of any expiration, lapse, suspension or termination of license(s).

The contract vendor is not required to be registered to perform design services pursuant to A.R.S. Title 32, Chapter 1 if the person actually performing the design services on behalf of the contract vendor is appropriately registered.

**17. OFFER ACCEPTANCE PERIOD/WITHDRAWAL**

**17.1. Late proposals:** Except as authorized by Arizona procurement rules and code, late proposals shall not be considered. Offeror shall be responsible for all shipping costs when requesting the return of a late proposal.

**17.2. Withdrawal of proposal:** An offeror may withdraw a proposal in writing at any time before proposal opening if the withdrawal is received before the proposal due date and time at the location designated in the Request for Proposal for receipt of proposals. After the opening time and date, proposals may not be withdrawn, except as allowed by Arizona procurement rules and code.

**18. ORDER OF PRECEDENCE**

In the event of a conflict in the provisions of the contract as accepted by Mohave, the following order of precedence shall prevail:

1. Special terms and conditions
2. General terms and conditions
3. Scope of work and specifications
4. RFP response
5. Attachments and exhibits
6. Documents referenced or included in the solicitation

**19. ORDERING CYCLE**

**19.1. Acceptance of orders:** This contract is for the sole use of Mohave and its members. All quotations provided to members must be based on prices in the contract and include the correct Mohave contract number. Contract vendor may only refuse a Mohave reviewed order under this contract after providing written documentation acceptable to Mohave describing the circumstances that warrant refusal. Improper documentation and/or frequent refusals may result in contract cancellation. Mohave may require the contract vendor to reject any purchase orders received from members based on this contract that may not comply with Mohave's rules, processes or standards.

**19.2. Audit of contract activity:** Mohave will audit some of the invoices related to this contract. The contract vendor agrees to provide all documentation necessary for Mohave to audit purchases made under contract, including invoices and credits issued to members, in a timely fashion.

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**19.3. Contract vendor contacts:** Contract vendor agrees to assign only one contact person for each of the following: accounting, audit, contract administration, escalation, main member contact, open order/status report, and reconciliation. These contacts may be the same person, with the exception of the escalation contact. The name(s) of the contact persons will be provided to Mohave.

**19.4. Open order and status reports:** Mohave will send contract vendor open order and status reports on a periodic basis. Contract vendor agrees to reply to information requests in a timely fashion.

**19.5. Orders in process:** Member purchase orders dated on or before the contract cancellation and/or expiration date, will be processed and are considered valid until order fulfillment, or cancellation by the member. Any such order must be in the possession of Mohave within a reasonable amount of time. Acceptance of such orders shall be at the sole discretion of Mohave.

**19.6. Purchase verification:** It is the member's independent responsibility to verify that quotations and purchase orders comply with the terms of the award of a contract or procurement.

**19.7. Quotations:** Quotations with no end date are considered invalid after sixty (60) days from the issue date.

## **20. PAYMENT**

**20.1. Contacting member about payment:** Contract vendor may contact member for payment for a product or service delivered to the member under the contract. Such contact shall be professional and courteous.

**20.2. Contract vendor invoice:** All invoices shall list the applicable member purchase order number and Mohave contract number. Contract vendor will invoice members directly. All transactions are payable in U.S. currency only. Contract vendor shall invoice member after delivery of goods and/or services. Goods and services shall be invoiced at applicable contract prices, which include Mohave's 1% administration fee.

Mohave's administration fee is included in the invoice amount paid by the member. Contract vendor shall remit administration fee to Mohave monthly. Administration fee shall be calculated at .0099 of the subtotal amount. The Mohave administration fee shall not be calculated on ancillary charges (e.g. performance bonds, shipping, transaction privilege tax, transportation charges, mileage, lodging, meals and incidental expenses (M&IE), permits).

**20.3. Contract vendor payment:** Member shall issue payment to contract vendor after receipt of invoice.

**20.4. Correct invoicing:** Contract products/services may not be invoiced greater than the purchase order. If incorrect invoices are discovered, contract vendor must correct invoices resulting in excess charges, no matter the cause of the error. Any excess payment must be returned to member within the time allowed by law, in the form of a check or credit memo, as determined by the member.

If a member is invoiced at less than contract prices, contract vendor will invoice the member for the difference unless Mohave approves the undercharge.

If contract pricing in effect on the contract has gone down between the time of the order and the invoice date, contract vendor may invoice at the current contract price.

**20.5. Credit hold:** Contract vendor agrees to advise Mohave's Procurement Manager within five (5) days if member(s) are placed on credit hold.

**20.6. Payment time:** Payment terms are net thirty (30) days from receipt of contract vendor's invoice.

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**20.7. Prepayment:** In accordance with the Uniform System of Financial Records and ARS §15-905(N), prepayments may be requested on items that normally require prepayment in order to be procured or to receive a discounted price. Items not meeting these prepayment specifications may be paid only after receipt of goods and services.

**20.8. Progress payments:** Members may make progress payments under the following conditions: 1) Member and contract vendor agree to the terms of the progress payments prior to issuing a purchase order; 2) the purchase order describes the amounts/percentages to be paid and the dates/frequency of payment; 3) member accepts responsibility for verifying the validity of each payment application; 4) payments are made only after goods and/or services are verified; and 5) any such payments are made in full compliance with member's local governing entity rules and any and all other applicable state rules and regulations.

**20.9. Quick pay discounts:** Quick pay discounts may be offered to members, provided they have received the materials or services, and that such discounts are available equally to all members. Mohave must approve such discounts in writing and before they are offered to members.

**20.10. Reporting and payment of administration fees to Mohave:** The contract vendor agrees to provide a Reconciliation Report detailing activity under the contract, and payment for Mohave administration fees for invoices paid or Pcard transactions made in the previous month.

**Purchases made with purchase orders:** Items in the report must include member names, PO numbers, amounts, administration fees, invoice numbers, invoice dates and credit/return information for all invoices paid in the prior month.

**Purchases made with Pcards:** The report must be identified as Pcard (or as a credit card) when submitted. Items in the report must include member names, notation that the purchase was made with a Pcard, date of transaction, job number designation, amounts, administration fees, invoice numbers (if applicable), invoice dates (if applicable) and credit/return information for all invoices paid in the prior month. An electronic copy (e.g. PDF) of the detailed Pcard sales receipt, invoice, or quotation shall be provided for review.

Payment and report are due as per a schedule agreed upon by Mohave and contract vendor. The initial due date shall be the **10<sup>th</sup>, 15<sup>th</sup>, 20<sup>th</sup>, 25<sup>th</sup> or 30<sup>th</sup>** of the following month and will be specified in an award notification letter. If no invoices were paid under the contract in the previous month, the contract vendor will provide notice of no activity. A sample reconciliation report will be made available upon award of contract.

Make Mohave administration fees payable to Mohave Educational Services Coop., Inc. Payments shall be mailed to:  
625 E. Beale St.  
Kingman, AZ 86401

**21. PREPARATION OF PROPOSAL and PROPOSAL FORMAT**

**21.1. Modification of proposal:** An offeror may modify a proposal in writing at any time before proposal opening if the modification is received before the proposal due date and time at the location designated in the Request for Proposals for receipt of proposals.

**21.2. Cost of proposal preparation:** Mohave will not reimburse the cost of developing, presenting, or providing any response to this solicitation.

**21.3. Offeror responsibility:** Offeror shall examine the entire solicitation, seek clarification of any item or requirement that may not be clear, and check all responses for accuracy before submitting proposal. Failure to examine any requirements shall be at offeror's risk. Negligence in preparing a proposal confers no right of withdrawal after due date and time.

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**21.4. Proposal forms:** The forms and format contained in the solicitation shall be used. Offerors may reproduce the forms and retype the information, but all of the required information must be presented in the tab order requested. Electronic or faxed proposals shall not be considered. ***Each offeror shall submit separately a technical and a price proposal.*** When applying the scoring method, the committee will separately evaluate the technical and price proposals. The technical proposal will be evaluated and scored before opening the price proposal. To be considered responsive, the offeror's entire proposal must reasonably and substantially conform to all the terms and conditions in the solicitation.

### **Technical and price proposals:**

**Technical proposal consists of:** the offer and acceptance form; instructions to offeror and checklist form; scope of work and specification documents with exceptions/deviations noted; *scope of work and specifications acceptance form*; Method of Approach; Qualification and Experience; primary vendor information; Supporting contract documents; bid bond/alternate security; special terms and conditions; *special terms and conditions acceptance form*; general terms and conditions; standard terms and conditions for construction; *general terms and conditions and standard terms and conditions for construction acceptance form*; amendments (if any); single job and aggregate bonding capacity; certificate of insurance; company financials; past performance and management plans; sample supplemental agreements; and any additional required information.

**Price proposal consists of (submitted in a sealed package from the technical proposal):** all pricing related to the work/services to be provided under an awarded contract, and pricing methodologies.

## **22. PROPOSAL OPENING**

Proposals shall be opened immediately following the proposal due date and time. The name of each offeror shall be publicly read and recorded in the presence of witnesses. All information in the proposals shall remain confidential until after award of contracts, with the exception of review by Mohave staff and selected evaluators.

## **23. PROSPECTIVE BIDDERS REGISTRATION**

Any offeror submitting a perfunctory proposal with no serious intent of being accepted may be removed from Mohave's prospective bidders list. Any vendor not responding to two (2) consecutive Requests for Proposal for similar procurements may be removed from the prospective bidders list. A "no bid" response or request to remain on the list is sufficient to keep a vendor on the Prospective Bidders Registration.

## **24. PROTESTS**

Protests shall be filed with Anita McLemore, C.P.M., the Executive Director (the District Representative), and shall be resolved in accordance with Arizona Procurement rules and code, ARS, Title 41, Chapter 23, Article 9 (<https://www.azleg.gov/arstitle>) and State Board Rules R7-2-1001 through R7-2-1196 (<http://azsos.gov/rules/arizona-administrative-code>). *A protest must be in writing and must be filed with the Executive Director at 625 E. Beale Street, Kingman, Arizona, 86401.* Protests based upon alleged improprieties in a solicitation shall be filed before the due date and time for responses to the solicitation. The interested party shall file the protest within ten (10) days after Mohave makes the procurement file available for public inspection. A protest filed on the tenth day must be received by 5:00 p.m., local Arizona time. The interested party may file a written request for an extension. The written request shall be filed before the time limit specified above and shall set forth good cause as to the specific action or inaction of Mohave that resulted in the interested party being unable to file the protest before the time limit specified above.

A protest shall be in writing and shall include the following information:

- The name, address and telephone number of the interested party;
- The signature of the interested party or the interested party's representative;
- Identification of the solicitation by contract number;

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- A detailed statement of the legal and factual grounds of protest including copies of any relevant documents;
- The form of relief requested.

Should Mohave prevail in an appeal of a decision issued by the Executive Director, appellant waives any objection to the hearing officer awarding Mohave its reasonable attorneys fees and costs along with the costs for the hearing.

### **25. RIGHT TO ASSURANCE**

Whenever one party to the contract has a good faith reason to question the other party's intent to perform, they may demand that the other party give written assurance of its intent to perform. If a demand is made and no written assurance is given within ten (10) days, the demanding party may treat this failure as an anticipatory breach of the contract.

### **26. SAFETY STANDARDS**

Items supplied under the contract shall comply with current applicable Occupational Safety and Health Standards of the Arizona Industrial Commission, National Electric Code, and National Fire Protection Association Standards.

### **27. SHIPPING**

**27.1. Shipping terms/transfer of title:** Shipments shall be F.O.B. destination. Title and risk of loss of material shall not pass to member until member receives the material at delivery point, unless otherwise provided in the solicitation.

**27.2. Shipment under reservation:** Contract vendor is not authorized to ship materials under reservation and no tender of a bill of lading will operate as a tender of the materials.

**27.3. Shipping charges:** Prices that include shipping to any location in Arizona, delivered to the specific receiving point identified in the purchase order, are preferred. If shipping is charged, it shall be that member is not charged more than the actual invoiced amount for shipping, and is prepaid by the contract vendor (PP&A). It is the member's responsibility to confirm shipping charges under the contract.

**27.4. Shipping errors/risk of transportation:** Shipping errors will be at contract vendor's expense. If contract vendor ships a product that was not ordered, contract vendor shall pay for return shipment at the convenience of member. All risk of transportation and all related charges shall be contract vendor's responsibility. Contract vendor shall file all claims for visible or concealed damage. Member will notify contract vendor promptly of any damaged goods and shall assist contract vendor in arranging for inspection.

### **28. SUSPENSION OR DEBARMENT STATUS**

Offeror shall include a letter in its proposal notifying Mohave of any debarment, suspension or other lawful action taken by any federal, state or local government within the last five years that precludes offeror or its employees from participating in any public procurement activity. Such letter shall provide name and address of the public procurement unit, effective date, duration, and relevant circumstances of the suspension or debarment. Failure to supply such letter or not disclose all pertinent information shall result in cancellation of any contract. **Letter shall be placed after Tab 1a.**

### **29. TAXES**

**29.1. Federal Excise Tax:** Most members are exempt from paying Federal Excise Tax.

**29.2. Payment of taxes:** Member is responsible for payment of all taxes listed on the invoice. Contract vendor is responsible for collecting such taxes and shall forward all taxes to the proper revenue office. All applicable taxes must be listed as a separate item on all invoices and will be paid by member issuing the purchase order.

**29.3. Property taxes:** Arizona public agencies may not pay state property taxes. (Arizona Constitution, Article 9, Section 2).

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**Technical Proposal – General Terms and Conditions**  
**(Place after Tab 1c)**

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**29.4. Reservation or tribal tax:** If goods or services are subject to reservation or tribal tax, contract vendor shall include such taxes as a separate item on the original invoice to the member.

**29.5. Transaction Privilege Tax (Sales Tax):** Members may be liable for Arizona Transaction Privilege Taxes, which may include state, county and city taxes. Contract vendor is responsible for charging taxes correctly.

**29.6. Taxes on construction:** Contract vendors for construction-related projects must follow the latest tax requirements as described in current Arizona Administrative Code and Department of Revenue transaction privilege tax procedures.

**30. TIME (DEFINITION OF)**

Periods of time, stated as a number of days, shall be in calendar days, not business days.

**Technical Proposal – Standard Terms and Conditions for Construction**  
**(Place after Tab 1c)**

**1. BID SECURITY**

**1.1. Bid security requirement:** School procurement rules [R7-2-1102 (A)] and as applicable in ARS §34-608 and §41-2573, require that all competitive sealed bidding for construction have bid security, if the amount of the construction contract will exceed the amount established by ARS §15-213(A). Bid security as a percentage of the bid amount is unacceptable, as this is a term contract with no specific bid amount. Bid security must be in the amount stated in "*Bid Bonds and Bonding Capacity.*"

**1.2. Form of bid security:** Acceptable bid security for this RFP will be a certified or cashier's check, or an annual or one time bid bond underwritten by a surety company licensed to issue bid bonds in Arizona [R7-2-1102 (B, C), ARS §34-608 and §41-2573]. Bid security may be provided using the form found in this RFP, with the principal being the prime contractor and the Obligee being Mohave Educational Services Cooperative, Inc. An agent of your licensed bonding agency shall sign the bond. If the original bond is not signed and/or has conflicting information, it shall render your proposal nonresponsive.

**2. CHANGE ORDERS**

**2.1. Adherence to specifications and drawings:** The contract vendor shall follow the requirements of all specifications and drawings as closely as actual construction and work of contract vendors shall permit. Should existing conditions or limitations require a major change or rearrangement, the change shall be allowed only upon issuance of a written change order.

**2.2. Change order requirement:** Member and contract vendor shall establish a procedure for identifying and approving changes to the work. Said procedure shall include provisions for field change orders. Member shall notify Mohave of any change that revises the cost of the project. Contract vendor shall not begin the revised work prior to receipt of the Mohave reviewed member change order.

Contract vendor agrees to follow all applicable rules and regulations for any change orders, including R7-2-1005 and as applicable in ARS §41-2552.

Change orders shall be properly documented in writing. Minor changes mutually agreed between the member and the contract vendor that do not involve compensation may be made without informing Mohave.

**2.3. Costs for changes associated with improper checking or coordination:** The cost of any change in construction due to improper checking of site and/or other conditions, or coordination by contract vendor, shall be borne by the contract vendor, and the contract vendor shall not be entitled to reimbursement for such costs.

**3. CONSTRUCTION CONTRACTS**

**3.1. Cancellation by Mohave:** Mohave reserves the right to cancel a contract resulting from this RFP if the original contract holder is sold and ownership is transferred to a new party. If Mohave cancels the contract, the cancellation clause will be exercised, as required.

**3.2. Compensation:** Compensation for received goods, terms of progress payments, and a schedule of payments shall be described in the contract. The agreement shall state that Mohave will not be responsible for any late fees due the contract vendor by the member.

**3.3. Member delays:** As required by ARS §15-213 (D), the contract vendor shall negotiate with member for the recovery of damages related to expenses incurred by the contract vendor for a delay for which the member is responsible, which is unreasonable under the circumstances and which is not within the contemplation of the parties to the contract between the two parties. Any such negotiations shall not void any provisions between the parties that require notice of delays, provide for arbitration or other procedure for settlement or provide for liquidated damages.

**Technical Proposal – Standard Terms and Conditions for Construction**  
**(Place after Tab 1c)**

- 3.4. Construction contract requirement:** In any contract between the contract vendor and a member based on this contract, the terms and conditions of this contract shall prevail. In any contract between the member and the contract vendor, the scope of work shall include all specifications, drawings, and other official documents. All applicable codes around which the contract is made shall be included, as will any technical specifications and general conditions. The contract vendor shall acquire and pay for all permits and approvals from local, county, state and federal offices needed to accomplish the work. Contract vendor shall be entitled to direct reimbursement for the cost of such permits.
- 3.5. Form of construction contracts:** A contract between the member and the contract vendor for construction shall be an industry standard agreement. The parties may agree to use the American Institute of Architects (AIA) General Conditions of Contract for Construction Form A201 as a guide.
- 3.6. Member representative:** All formal contact between the contract vendor and/or contract vendor's personnel and the member shall be processed through the member representative. The member shall designate the member representative at the time of purchase.
- 3.7. Terms of acceptance:** Terms for acceptance by the owner and title to work must be clearly agreed upon and described in the contract. If any part of the construction requires the member to assume control before the completion, this shall be defined. Both parties shall agree on the definition of what constitutes final acceptance. Upon completion of the project, the worksite shall be left in a condition equal to or better than before the project.
- 3.8. Void provisions:** A provision, covenant, clause or understanding in, collateral to or affecting a construction contract that makes the contract subject to the laws of another state or that requires any litigation, arbitration or other dispute resolution proceeding arising from the contract to be conducted in another state is against public policy of the State of Arizona and is void and unenforceable. (ARS §15-213, §34-227, and §41-2583)
- 3.9. Work performed by the member:** Work to be performed by the member must be clearly described and agreed upon prior to project start up.

**4. CONSTRUCTION SCHEDULE**

- 4.1. Schedule adjustment:** The member retains the right to extend the schedule of work or to suspend the work, and to direct the contract vendor to resume work when appropriate. The agreement must describe an equitable adjustment for added costs caused by any suspension. Any increases shall be invoiced per approved contract pricing as allowed in the agreement.
- 4.2. Schedule requirement:** A schedule for performance of work that can be met without planned overtime is the responsibility of the contract vendor.
- 4.3. Work crew size:** The cost for each project shall include all costs of all necessary trained personnel to complete the project on, or before, the completion date(s) set forth in the contract. The member shall not incur additional expense for upsized crews, nor overtime costs, which might be necessary for the contract vendor to complete the project on schedule.

**5. COORDINATION**

- 5.1. Conflict with member activities:** The contract vendor and member shall coordinate activities so as to avoid conflicts. The contract vendor shall make every reasonable effort not to interrupt scheduled member activities with work under the contract. The contract vendor shall notify the member of any construction work that may negatively impact scheduled member activities.
- 5.2. Coordination with other vendors:** The contract vendor shall coordinate with other contractors.
- 5.3. Interruption of other work:** The contract vendor shall employ such methods or means as will not cause any interruption of, or interference with, work of any other contractor on the project site.

**Technical Proposal – Standard Terms and Conditions for Construction**  
**(Place after Tab 1c)**

**6. DELIVERY OF CONSTRUCTION MATERIALS**

- 6.1. Condition of materials on delivery:** The contract vendor shall deliver materials to the worksite in new, dry, unopened, and well-marked containers showing product and contract vendor's name. Damaged or unlabeled materials will not be accepted.
- 6.2. Delivery requirement:** The contract vendor shall deliver materials in sufficient quantity to allow for continuity of work. Delivery shall be coordinated with the member's representative.
- 6.3. Precautions:** The contract vendor shall take all necessary precautions to protect its materials from damage, theft and misuse. The member shall have no responsibility for such precautions or protection.
- 6.4. Rejected and damaged material:** Damaged or rejected materials shall be immediately removed from the work area.

**7. INSURANCE**

**Course of Construction Insurance:** Upon request from member, contract vendor shall purchase and maintain course of construction insurance equal to the estimated replacement cost of the property after completion of the entire work at the site as called for in the purchase order. The insurance form shall be an "all risk" type policy with standard exclusions. Coverage shall include temporary structures, scaffolding and office trailers at the site, as well as materials and equipment at the site destined to become a permanent part of the property. Any additional costs associated with course of construction insurance must be identified in the quote.

**8. LABOR PRACTICES**

- 8.1. Labor practices:** The contract vendor must agree to treat its labor in keeping with its labor contract agreement and to the best interest of the member. Any overtime practices or retroactive agreements with labor unions that would be to the detriment of the member must be limited to only those approved by the member.
- 8.2. Labor requirements:** The method and manner of performance must be stated in quotes and/or project documents: employees of the contract vendor are not employees of the member; the level of competency of the personnel will be subject to approval by the member; the contract vendor must agree to comply with all current applicable federal, state, and local laws; adjoining property owners must not be annoyed by noise, pollutants, material hauling operations; procedures for dealing with fire, theft, and storm damage must be established; methods the contract vendor will use to guarantee safe job practices relating to the health and welfare of the member employees and contract vendor employees will be clearly stated in quotes and/or project documents.
- 8.3. Quality of work:** All work under the contract shall be accomplished by experienced craftsmen, helpers and laborers under the supervision of the foreman or supervisor.
- 8.4. Removal of Employee or Representative:** The member shall have the right to require the contract vendor to remove from the project any employee or representative of the contract vendor, its subcontractors or suppliers that the member may deem incompetent, careless, insubordinate, or otherwise unacceptable.
- 8.5. Supervision:** The contract vendor shall furnish the services of an experienced foreman or supervisor who will continually be in charge of work on the project. The foreman or supervisor shall provide continuous supervision, coordination and inspection of the work required under the contract.

**9. LIQUIDATED DAMAGES**

Any agreements on liquidated damages and early completion incentives shall be between the member and the contract vendor and must be agreed upon in writing prior to start up. If the member declines liquidated damages or early incentive agreement, the contract vendor shall obtain a written and signed statement to this effect. Mohave shall not be a party to liquidated damages or early completion incentive agreements.

**Technical Proposal – Standard Terms and Conditions for Construction**  
**(Place after Tab 1c)**

**10. LITIGATION FOR NONPAYMENT OR NONPERFORMANCE**

All litigation for nonpayment or nonperformance shall be filed as allowed in R7-2-1103 (F), and in ARS title 34 or 41 as applicable.

**11. MEMBER COSTS**

Temporary electrical service and the cost for power, the cost for water, and other member costs shall be identified in writing and agreed upon.

**12. PERFORMANCE AND PAYMENT BONDS**

**12.1. Issuing performance and payment bonds:** It shall be the sole responsibility of the member to determine if any applicable performance and payment bonding requirements apply to the procurement under an awarded contract. Member must request that the contract vendor provide the performance and payment bonds that meets the requirements prior to project implementation.

The contract vendor shall supply Mohave with a copy of the procured bonds upon request. If the contract vendor fails to deliver any required performance or payment bonds requested by the member, the contract with Mohave may be cancelled.

**12.2. Payment bond requirement:** An irrevocable payment bond shall be executed in an amount equal to 100% of the price specified in the contract between the member and the contract vendor by a surety company authorized to do business in Arizona. This bond will protect all persons supplying labor and material to the contract vendor for the performance of the work provided in the contract.

**12.3. Performance bond requirement:** An irrevocable performance bond shall be executed in an amount equal to 100% of the price specified in the contract between the member and the contract vendor by a surety company authorized to do business in Arizona. The performance bond and payment bond for each job order shall cover the full amount of the project under the job order, and shall not include coverage of any amounts for design services, preconstruction services, finance services, maintenance services, operations services or other related services included in the job order. (The contract shall be available for use by any or all Mohave members. There is not an initial estimate of the amount of construction that will be done under the contract by the members. Therefore, the amount of performance and payment bonds must be based upon the amount of each job order.)

**13. PROGRESS PAYMENTS**

**13.1. Progress Payments on Construction:** R7-2-1105 and ARS §34-609 and §41-2577 allows for progress payments if the contract vendor agrees to adhere to ARS §34-609(B)(D)(F) and 41-2577(B)(D)(F) and as applicable in ARS §34-221. All progress payments must be invoiced to the member; it is the responsibility of the member to review and approve any estimates of work completed. If the member issues a written statement to the offeror that the estimate of work is not approved and certified, the member may withhold an amount from the progress payment the member reasonably expects to incur in correcting the deficiency set forth in the written finding, as permitted in R7-2-1105 (A) and ARS §34-609(B)(2) and §41-2577(A). In such cases, the offeror agrees to hold Mohave harmless for any deficiency of payment.

Progress payments may be made to the contract vendor on the basis of a duly certified and approved estimate of work performed during the preceding month. The contract vendor must agree to pay any subcontractors or material suppliers within seven days of their receipt of the progress payment, unless otherwise agreed on in writing between the parties.

**Technical Proposal – Standard Terms and Conditions for Construction**  
**(Place after Tab 1c)**

**13.2. Schedule of payments:** Once all bonds are in place, the contract vendor and the member will agree upon a schedule of payments based on identifiable milestones.

If any payment is delayed beyond 30 days from the due date, the offeror agrees not to charge Mohave interest on the late payment. Any late charges will be the total responsibility of the member. The offeror may extend any due date to avoid the requirement to pay interest in R7-2-1105 (D) and ARS §34-609(I) and §41-2577(E).

Acceptance of final payment is a waiver of all claims except unsettled claims previously made in writing.

**13.3. Subcontractor notification:** A subcontractor to the prime contractor may request, in writing, that member notify the subcontractor in writing within five (5) days from payment of each progress payment made to the prime contractor [R7-2-1105(C) and ARS §41-2577(C) and §34-609(G). Upon request, the prime contractor must provide Mohave or the members with a contact name, title, company name, mailing address and fax number for all subcontractors and suppliers that are covered by a payment bond.

**14. PROJECT ADVERTISING**

The contract vendor must agree that the member reserves the right to release information about the project and that any advertising of the project by the contract vendor must be approved by the member.

**15. PROJECT COMPLETION**

**15.1. Project documents:** Upon completion of the work, the contract vendor shall present the member with all documents necessary to closeout the project. Maintenance manuals, drawings, warranties on installed equipment, etc., shall be given to the member.

**15.2. Unfinished work:** Even if final payments are made, if the member discovers an unfinished job that should have been completed, the contract vendor shall complete the work in a timely fashion at no additional cost.

**16. PUBLIC WORKS**

**16.1. Preservation:** The contract vendor shall be responsible for the preservation of all public and private property included on or adjacent to the worksite. This requirement shall apply to the surface and hidden features of the property.

**16.2. Receipt of public funds:** Contract vendors and subcontractors will meet the requirements of ARS § 34, Article 3, for eligibility to receive public funds.

**16.3. Residency requirement:** ARS §34-302 states that only persons who have been for not less than one year a bona fide resident of Arizona shall be employed in the performance in any public work. A public works contract is defined in ARS §34-321 as "*a contract to which the state or a political subdivision is a party involving the employment of laborers, workmen or mechanics in the construction, alteration or repair of public buildings or improvements.*" It shall be the responsibility of the contract vendor to comply with these laws, when applicable.

**16.4. Restoration:** The contract vendor shall repair, rebuild or otherwise acceptably restore any property on or adjacent to the worksite that was damaged during the course of work on the project. Such restoration shall be at the contract vendor's expense, and is not subject to reimbursement by the member.

**Technical Proposal – Standard Terms and Conditions for Construction**  
**(Place after Tab 1c)**

**16.5. Public building rules, regulations and codes:** Construction work on public buildings shall be in compliance with the state fire code unless a fire code has been adopted by the city, town, county or fire district in which the building is located. Public buildings shall be constructed in compliance with applicable building, plumbing, electrical, fire prevention and mechanical codes adopted by the city, town, county or fire district in which the building is located. If a public building is built in an area that has not adopted local codes, the building shall be designed or constructed according to the state fire code adopted by the state fire marshal and the building, plumbing, electrical, fire prevention and mechanical codes that apply in the largest city in the county in which the building is located. Public buildings are subject to those codes that apply and are in effect when the building is designed or constructed and to the currently adopted codes when a building is found to be structurally unsafe, without adequate egress, or a fire hazard or are otherwise dangerous to human life. "Public Building" means a building or appurtenance to a building that is built in whole or in part with public monies (see ARS §34-461).

**17. RETENTION**

Retention shall not be allowed for any progress payments made under this contract.

**18. RULES, REGULATIONS AND CODES**

**18.1. Certification of personnel regarding renovations, repair, and painting:** Personnel performing renovations, repair, and painting activities that disturb lead-based paint in target housing and child-occupied facilities constructed before 1978, shall comply with Part II, Environmental Protection Agency, 40 CFR Part 745, Lead; Renovation, Repair, and Painting program; Lead Hazard Information Pamphlet (<http://www.epa.gov/>).

**18.2. Compliance:** All work will be accomplished in conformance to current applicable OSHA safety requirements, and any additional federal, state, or local fire or safety requirement. When specifications or scope of work will result in a violation of a code or result in an unsafe condition, the contract vendor must inform the member of the situation. The contract vendor will not construct any device or produce any condition that intentionally violates a fire or safety code or safety standard.

**18.3. Hazard notification:** Contract vendor must advise member whenever work is expected to be hazardous.

**18.4. Liens/serial numbers:** All materials shall be free of liens. Proposals must be for equipment on which the original manufacturer's serial number has not been altered in any way.

**19. SURETY COMPANIES**

Surety companies issuing bid bonds, performance bonds and/or payment bonds under this contract must be licensed by the Arizona Department of Insurance. Evidence of such license will be the name of the surety company as found in the license search database provided by the Arizona Department of Insurance ([www.insurance.az.gov](http://www.insurance.az.gov)).

**20. WORKSITE**

**20.1. Site access:** The member shall provide an all-weather road to the site and prepare the site with room for construction equipment.

**20.2. Site conditions:** The condition of the site before start up shall be agreed upon between the member and the contract vendor and shall be written into the contract.

**Technical Proposal – General Terms and Conditions and  
Standard Terms and Conditions for Construction Acceptance Form  
(Place after Tab 1c)**

*Signature on Page 2 certifies complete acceptance of the General Terms and Conditions and the Standard Terms and Conditions for Construction in this solicitation, except as noted below (additional pages may be attached, if necessary).*

**Check one of the following responses to the General Terms and the Standard Terms and Conditions for Construction:**

- We take no exceptions/deviations to the General Terms and Conditions and the Standard Terms and Conditions for Construction.

*(Note: If nothing is listed below, it is understood that no exceptions/deviations are taken.)*

- We take the following exceptions/deviations to the General Terms and Conditions and the Standard Terms and Conditions for Construction. All exceptions/deviations shall be clearly explained. Reference the corresponding General Terms and Conditions and/or Standards Terms and Conditions for Construction that you are taking exceptions/deviations to. Clearly state if you are adding additional terms and conditions to the General Terms and Conditions and the Standard Terms and Conditions for Construction. Provide details on your exceptions/deviations below:

*(Note: All requested exceptions/deviations must be clearly explained. Reference the specific terms and conditions that you are taking exceptions/deviations to, detail any proposed substitute terms and conditions, and clearly demonstrate how Mohave and its membership will be better served by the substituted terms and conditions. Unacceptable exceptions/deviations shall remove your proposal from consideration for award. Mohave shall be the sole judge on the acceptance of exceptions and Mohave's decision shall be final.)*

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**DIVISION 1-GENERAL REQUIREMENTS**

1.0 As required by member

**DIVISION 2-EXISTING CONDITIONS**

**Demolition**

- 1.0 DESCRIPTION OF WORK: This specification covers the dismantling, salvage, demolition, and disposal of designated structures, utilities, and/or materials as directed by the Authorized Member Representative.
- 2.0 PRODUCTS: (Not Used).
- 3.0 EXECUTION:
- 3.1 Submittals: Procedures proposed for the accomplishment of all demolition and salvage work, including a detailed description of the methods and equipment to be used for each operation and the scheduled sequence of operations, shall be submitted to the Authorized Member Representative for approval. Operations that involve interruption of utility services or the handling of toxic or hazardous materials shall be scheduled and approved by the Authorized Member Representative at least 48 hours prior to the start of such operations.
- 3.2 Clearances and Permits: Obtain as required from local authorities.
- 3.3 Salvage: Title to all materials and equipment to be demolished is vested in the member. Unsalvageable materials shall be disposed of as directed by the Authorized Member Representative. Materials and equipment for Member salvage or reuse shall be carefully removed and delivered to a storage site designated by the Authorized Member Representative.
- 3.4 Protection of Existing Work: All necessary precautions shall be taken to ensure against damage to existing work that is to remain in place or is to remain the property of the Member. Damaged areas shall be repaired or replaced with new products to match existing surrounding surfaces. Shoring, bracing, and supports shall be provided as required and structural elements shall not be overloaded. Care shall be taken to prevent unscheduled interruptions to any utility service.
- 3.5 Protection From Weather: The interior of buildings and all materials and equipment shall be protected from the weather at all times.
- 3.6 Dust and Dirt Control: Dust and dirt resulting from demolition operations shall be controlled to prevent spread into occupied portions of buildings and to avoid creation of a nuisance to the surrounding area. Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as ice, flooding, and pollution.
- 3.7 Burning: Burning at the project site for the disposal of refuse and debris will not be permitted.
- 3.8 Explosives: The use of explosives will not be permitted.
- 3.9 Hazardous Materials: Extreme care and caution shall be exercised at all times when handling toxic or hazardous materials in order to prevent harm to personnel and property and to prevent environmental contamination. Federal and state regulations governing handling, transportation,

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and disposal of such materials shall be rigidly adhered to.

- 3.10 Utilities: Temporary interruptions, disconnections, and relocation of existing utilities and removal of abandoned utility services shall be as directed by the Authorized Member Representative.
- 3.11 Cleanup: Debris and rubbish shall not be allowed to accumulate in buildings or on site. Local regulations regarding hauling and disposal shall be followed.

**DIVISION 3-CONCRETE**

**Concrete Formwork**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of structural cast-in-place concrete formwork. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Form Materials shall conform to ACI 301 and shall be made especially for concrete form use.
    - 2.1.1 Corrugated or Formed Steel Sheets: ASTM A 361, G90 Coating, with depth of corrugations not less than 1/2 inch.
    - 2.1.2 Plywood: DOC PS 1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade. Minimum thickness shall be 3/4 inch.
    - 2.1.3 Asbestos Cement Formboard: ASTM C 220, 1/4 inch thick, Type U or Type F.
    - 2.1.4 Cylindrical Columns and Supports: Round-section members with paper or fiber tubes, constructed of laminated plies using water-resistant adhesive with wax-impregnated exterior.
    - 2.1.5 Pan Type: 16-gauge steel with 1/4-inch thick concrete form hardboard conforming to AHA A135.4, or fiberglass at least 0.11 inch thick.
    - 2.1.6 Lumber: Straight, uniform width and thickness and free from knots, offsets, holes, dents, and other surface defects. Minimum thickness shall be 1 inch.
    - 2.1.7 Void Forms: Moisture-resistant treated paper faces, biodegradable.
  - 2.2 Formwork Accessories:
    - 2.2.1 Form Ties: Form ties shall be metal, factory-fabricated, removable or snap-off and will leave holes not less than 1/4 inch nor more than 1 inch in diameter and not more than 1 inch deep.
    - 2.2.2 Form coating shall be industrial colorless material that will not stain concrete, absorb moisture, or impair natural bonding.
    - 2.2.3 Fillets for chamfered corners shall be wood strips or rigid plastic type.
    - 2.2.4 Dovetail anchor slots shall be galvanized steel material with release-tape-sealed slots and bent tab anchors, securable to concrete formwork.
    - 2.2.5 Flashing reglets shall be galvanized steel with release-tape-sealed slots and alignment splines for joints, securable to concrete formwork.
    - 2.2.6 Anchorages, spikes, nails, and lag and through bolts shall be as required to maintain formwork in place.
- 3.0 EXECUTION:
  - 3.1 Inspection: forms shall be cleaned and reconditioned between usages. Temporary ports shall be provided in formwork to facilitate cleaning and inspection.
  - 3.2 Preparation:
    - 3.2.1 Formwork shall be constructed to maintain tolerances in accordance with ACI 301.
    - 3.2.2 Form coating shall be applied prior to placing reinforcing steel, anchoring devices, and embedded items. Do not apply form coating where concrete surfaces are scheduled to receive special finishes.
    - 3.2.3 Chamfer strips shall be provided on external corners that will be exposed.
  - 3.3 Form Removal: Forms shall be removed in a progressive manner that will prevent injury to the concrete.

**Concrete Reinforcement**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of concrete

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reinforcement. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendation. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Reinforcement Materials:

2.1.1 Billet-Steel Reinforcing Bars: ASTM A 615, minimum Grade 40 steel, plain or deformed bars, uncoated or galvanized finish.

2.1.2 Rail-Steel Reinforcing Bars: ASTM A 616, Grade 50 and 60 steel, plain or deformed bars, uncoated or galvanized finish.

2.1.3 Axle-Steel Reinforcing Bars: ASTM A 617, minimum Grade 40 steel, plain or deformed bars, uncoated or galvanized finish.

2.1.4 Welded Steel Wire Fabric: ASTM A 185 for plain type and ASTM A 497 for deformed type fabric.

2.1.5 Stirrup Steel: ASTM A 82.

2.1.6 Dowel Steel: ASTM A 675, Grade 80 or ASTM A 499. Steel pipes, if used for dowels, shall be closed at each end with mortar, metal, or plastic cap and shall conform to ASTM A 53, Schedule 80.

2.2 Reinforcement Accessories:

2.2.1 Wire Ties: 16 gauge black annealed wire.

2.2.2 Chairs, bolsters, bar supports, and spacers shall be provided in conformance with ACI SP-66. Supports for formed surfaces exposed to view shall be plastic protected wire or stainless steel. Precast concrete, if used for bar supports, shall be wedge-shaped, not larger than 3-1/2 inches by 3-1/2 inches in thickness and with an embedded hooked tie wire for anchorage.

3.0 EXECUTION:

3.1 Regulations:

3.1.1 Reinforcement detailing and placement shall conform to ACI 318.

3.1.2 Laps or splices shall conform to ACI 318.

3.1.3 Welding shall comply with AWS D1.4.

3.2 Installation:

3.2.1 Reinforcement shall be free from loose or flaky rust and mill scale.

3.2.2 In slabs, beams, and girders, reinforcing steel shall not be spliced at points of maximum stress.

3.2.3 Dowels and tie bars in slabs on grade shall be placed at right angles to construction joints.

3.2.4 Wire fabric reinforcement shall be continuous between expansion, construction, and contraction joints in slabs on grade and between expansion joints in other slabs.

3.2.5 Reinforcing bars shall not be continuous through expansion joints but shall be 2 inches clear from the joint.

**Concrete Accessories**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of concrete accessories. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Joint Materials:

2.1.1 Rubberized Asphalt Compound: ASTM D 1190.

2.1.2 Polyurethane-Base Elastomeric: Fed. Spec. TT-S-230.

2.1.3 Asphalt Compound: ASTM D 1190.

2.1.4 Liquid Neoprene: Applicable standards and/or specifications.

2.2 Sealer: Fed. Spec. TT-S-00227.

2.3 Waterstop:

2.3.1 Polyvinyl chloride: 1,750 psi minimum tensile strength, working temperature range from minus 51 F to plus 175 F, ribbed flaps on one side only.

2.3.2 Extruded neoprene: 2,000 psi minimum tensile strength, 60 Shore A hardness, flush or recessed from joint.

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3.0 EXECUTION:

- 3.1 Preparation: All surfaces of joints to which sealer is to be bonded shall be absolutely clean, dry, and free of loose concrete, dirt, oil, or other foreign material.
- 3.2 Application:
  - 3.2.1 All joints shall be in accordance with ACI 318.
  - 3.2.2 Accessible edges of expansion joint shall be sealed with sealer.
  - 3.2.3 The ambient temperature shall be between 50 and 100 F when the primer and joint sealing compound are applied.
  - 3.2.4 Contraction joints shall have a minimum width of 1/8 inch and a depth of 1/4 the slab thickness or 1-1/2 inches minimum, whichever is greater.
  - 3.2.5 Construction joints shall be doweled construction.
  - 3.2.6 Expansion joint filler shall be installed below the finished floor with a temporary wood strip to form a groove not less than 3/4 inch deep.
  - 3.2.7 Waterstops shall be installed so as to form a continuous water-tight diaphragm.

**Cast-in-place Concrete**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of cast-in-place concrete. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Concrete Admixtures:
    - 2.1.1 Air-Entraining Admixture: ASTM C 260.
    - 2.1.2 Accelerating Admixture (Calcium Chloride): ASTM D 98.
    - 2.1.3 Water-Reducing or Retarding Admixture: ASTM C 494.
  - 2.2 Concrete Mixture:
    - 2.2.1 Cement: ASTM C 150.
    - 2.2.2 Normal Weight Aggregate: ASTM C 33.
    - 2.2.3 Water: Potable, free from deleterious substances.
    - 2.2.4 Proportion of cement, aggregate, and water shall comply with ACI 318.
    - 2.2.5 Concrete shall have a compressive strength (28 day) as indicated on the drawings. Entrained air by volume shall be 6 percent, and the slump shall be a maximum of 4 inches and a minimum 1 of inch. All reinforcing steel shall be Grade 60.
  - 2.3 Concrete Accessories:
    - 2.3.1 Bonding agent shall be two component epoxy resin, two component polysulphide-epoxy, polysulphide polymer epoxy, or polysulphide polymer epoxy resin.
    - 2.3.2 Vapor barrier shall consist of 6-mil polyethylene sheet, complying with ASTM C 171, or heavy Kraft papers laminated together with glass fiber and overcoated with polyethylene.
    - 2.3.3 Floor Hardener:
      - 2.3.3.1 Metallic Floor Hardener: Magnesium fluosilicate and zinc fluosilicate with water.
      - 2.3.3.2 Non-metallic floor hardener shall be used when hardened floor is subject to light or medium floor traffic.
- 3.0 EXECUTION:
  - 3.1 Concrete Placement:
    - 3.1.1 Formwork, reinforcing steel, and embedment items shall be inspected before placing concrete.
    - 3.1.2 Concrete placement shall comply with ACI 304 and 301.
    - 3.1.3 Cold weather placing shall be in compliance with ACI 306. Concrete mixture temperature shall be not less than 50 F.
    - 3.1.4 Hot weather placing shall be in compliance with ACI 305. Concrete mixture temperature shall be not more than 80 F.
  - 3.2 Concrete finishes shall comply with ACI 301.
    - 3.2.1 Float finish shall be applied to monolithic slab surfaces receiving trowel finish or slab surfaces to be covered with membrane or elastic waterproofing.

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- 3.2.2 Trowel Finish: Power-driven troweling or hand troweling shall be applied to monolithic slab surfaces to be exposed to view and slab surfaces covered with resilient flooring.
- 3.2.3 Broom finish shall be applied to exterior concrete platforms, stairs, ramps, etc.
- 3.2.4 Rough Slab Finish: Slabs shall be screeded with straight edges so that no coarse aggregate is visible and slab is suitable to receive fill and mortar setting beds.

**Concrete Topping**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of concrete floor toppings. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Cement: Portland cement, ASTM C 150, Type I or III.
  - 2.2 Sand: ASTM C 33.
  - 2.3 Coarse Aggregate: ASTM C 33, maximum size 3/8 inch.
  - 2.4 Granolithic Material: Emery, hard mineral, or non-staining metallic material finely ground to produce non-skid surface.
- 3.0 EXECUTION:
  - 3.1 Integral Topping: Topping shall be a one part cement, one part sand, and two parts aggregate mix to produce a hard topping with a minimum 28-day compressive strength of 5,000 psi.
    - 3.1.1 Surface of base slab shall be roughened before placing topping.
    - 3.1.2 Spread topping mixture evenly over base, bring to required depth, and strike off level with a straightedge. Consolidate surface by power-float finishing.
    - 3.1.3 Hard trowel-finish slab topping.
    - 3.1.4 Control joints in topping shall be located directly above joints in base slab.
  - 3.2 Granolithic Finish: Topping shall be a one part cement, one part sand, and 1-1/2 parts aggregate mix. Topping shall be placed same as integral topping.
    - 3.2.1 Prior to final troweling, granolithic material shall be spread evenly over the topping surface.
    - 3.2.2 Granules shall be worked into the surface to provide complete bonding with the topping but also to provide an abrasion-resistant, non-skid surface.

**Exposed Aggregate Concrete**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of exposed aggregate finish on concrete. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Cement: ASTM C 150, Type I Portland cement.
  - 2.2 Admixtures: ASTM C 494, ASTM C 260.
  - 2.3 Aggregate: ASTM C 33.
  - 2.4 Water: Clean, potable.
  - 2.5 Cleaning Agent: Commercial grade muriatic acid, mixed 1 part acid to 10 parts water.
  - 2.6 Bonding Agent: Polyvinyl acetate emulsion.
  - 2.7 Surface Aggregate: As directed.
- 3.0 EXECUTION:
  - 3.1 Concrete shall be placed and vibrated to ensure that concrete is consolidated and that all voids are filled.
  - 3.2 Formed Concrete:
    - 3.2.1 Leave forms in place until removal can be effected without damage to the shape or strength of the concrete but, in no case, in less than 24 hours. Longer time periods will be required when lower ambient temperatures are experienced.
    - 3.2.2 Immediately after removal of form work, remove surface cement paste from around aggregate by

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- either washing with water and scrubbing with a stiff bristle brush, wetting and scrubbing surface with acid etch solution, or sandblasting surface.
- 3.2.3 Cover concrete and continue curing procedures.
  - 3.3 Slabs:
    - 3.3.1 Allow concrete to cure until slab can be loaded without structural damage but, in no case, in less than 24 hours.
    - 3.3.2 Uncover slab and remove surface cement paste from around aggregate, using methods described for the removal of paste from formed concrete.
    - 3.3.3 Cover concrete and continue curing procedures.
  - 3.4 Exposure: Do not expose more than 40 percent of aggregate surface.
  - 3.5 Surface-Applied Aggregate:
    - 3.5.1 Evenly distribute the aggregate on the prepared concrete surface.
    - 3.5.2 Work aggregate into surface to form permanent bond.
    - 3.5.3 Provide proper curing conditions for exposed aggregate surface.

**Rusticated Concrete Finishes**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of rusticated concrete finishes. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Overlaid Plywood: DOC PS 1, B-B High Density Overlaid Concrete Form, Class I.
  - 2.2 Plywood: DOC PS 1, B-B (Concrete Form) Plywood, Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection mark.
  - 2.3 Chamfer Strips: Clear white pine with surface against concrete to be planed, metal, PVC, or rubber.
- 3.0 EXECUTION:
  - 3.1 Form Construction: Forms shall be constructed to provide required sizes, shapes, lines, and dimensions and to provide continuous, straight, smooth exposed surfaces. Forms shall be fabricated for easy removal without hammering or prying against concrete surfaces. The number of joints shall be minimized. Joints shall be made watertight to prevent leakage of cement paste. Provisions shall be made for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, inserts, and other features required in the work.
  - 3.2 Form Coatings: Forms shall be oiled with form-coating compounds that will not bond with, stain, nor adversely effect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.
  - 3.3 Finish: Fins and other projections shall be completely removed and smoothed. A smooth rubbed finish shall be provided not less than one day after form removal. •03353

**Solid Board Concrete Finishes**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of solid board concrete finishes. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Overlaid Plywood: DOC PS 1, B-B High Density Overlaid Concrete Form, Class I.
  - 2.2 Plywood: DOC PS 1, B-B (Concrete Form) Plywood, Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection mark.
  - 2.3 Fiberboard: AHA A135.4, tempered, waterproof, screenback, concrete form hardboard.
- 3.0 EXECUTION:
  - 3.1 Form Construction: Forms shall be constructed to provide required sizes, shapes, lines, and dimensions and to provide continuous, straight, smooth, exposed surfaces. The number of joints shall be minimized. Joints shall be made watertight to prevent leakage of cement paste.

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- 3.2 Form Coatings: Forms shall be oiled with form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.
- 3.3 Finish: Fins and other projections shall be completely removed and smoothed. A smooth rubbed finish shall be provided not later than one day after form removal.

**Flexural Concrete**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of flexural concrete. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Cement: ASTM C 150.
  - 2.2 Fine and Coarse Aggregates: ASTM C 33.
  - 2.3 Admixtures:
    - 2.3.1 Air-Entraining Agents: ASTM C 260.
    - 2.3.2 Retarders: ASTM C 494.
    - 2.3.3 Pozzolans: ASTM C 618.
  - 2.4 Mixture Proportions: The concrete shall possess the required 28-day flexural strength and shall be tested in accordance with ASTM C 293 and ASTM C 192.
- 3.0 EXECUTION:
  - 3.1 Placing: Concrete shall be deposited in the forms or in front of slip-form pavers within 45 minutes from the time all ingredients are charged into the mixing drum. Concrete shall be deposited as close as possible to its final position. The placement of the concrete shall be continuous and at a uniform rate without unscheduled stops. Concrete shall be consolidated with mechanical vibrating equipment immediately after spreading.
  - 3.2 Finishing operations shall be started immediately after placement of the concrete. Finishing shall be by the machine method except that, where directed, the hand method will be permitted on odd slab widths or shapes and in event of breakdown of the mechanical equipment to finish concrete. The sequence of operations shall be as follows: finishing, floating, straightedging, texturing or troweling, and, where directed, edging of joints.
  - 3.3 Curing: Concrete shall be protected against loss of moisture and rapid temperature changes for at least 7 days from the beginning of the curing operation. Unhardened concrete shall be protected from rain and flowing water. Protection shall be provided as necessary to prevent cracking due to temperature changes during the curing period.

**Specially Placed Concrete**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of pumped concrete. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Concrete pumps shall pump a minimum of 100 cubic yards of concrete per hour.
    - 2.1.1 Piston Type: Pump shall draw alternately from a hopper into the discharge pipe by a piston, operated mechanically or hydraulically.
    - 2.1.2 Pneumatic Type: Air pressure shall force the concrete into the discharge pipe.
    - 2.1.3 "Squeeze" Type: Pump-powered rollers shall deform a concrete-filled flexible tube to push the concrete into the discharge pipe.
  - 2.2 Discharge Lines:
    - a. 3- to 6-inch steel pipe.
    - b. 5-inch aluminum pipe with acceptable coating.
    - c. 4- to 5-inch rubber hose.

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- 2.3 Hopper: 15 to 20 cu ft concrete capacity.
- 3.0 EXECUTION:
- 3.1 Slump loss shall be less than one inch while passing through the pumping system.
- 3.2 When concrete must be pumped long distance, a relay system shall be installed (one pump feeds into the hopper of another pump).
- 3.3 Placing concrete by pumping methods shall comply with ACI 304.2R.

**Second-pour Concrete**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of second-pour concrete. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Second-pour concrete shall match the materials and mix used for first-pour concrete. Use of second-pour concrete shall be in pre-planned situations in which a small section of the first pour must be interrupted for purposes of expediting construction. Alternating- section pours of large slabs or walls shall not be considered first- or second-pour concrete. Second-pour concrete planning shall be approved by the Authorized Member Representative.
- 3.0 EXECUTION:
- 3.1 Preparation:
  - 3.1.1 All bulkheads and keyways used as limits of the first pour shall be removed and contact surfaces prepared to receive the second-pour concrete.
  - 3.1.2 All forms, reinforcing, and embedments installed for the first pour that will be utilized in the second-pour shall be cleaned and prepared.
- 3.2 Erection:
  - 3.2.1 All additional forms, reinforcing, and embedments required for the second-pour concrete shall be installed.
  - 3.2.2 The second-pour concrete shall be placed in the manner specified for the first-pour concrete.
  - 3.2.3 The curing procedures used for the first-pour concrete shall be used for the second-pour concrete unless otherwise directed or approved by the Authorized Member Representative.

**Concrete Curing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for concrete curing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Impervious Sheet Materials: ASTM C 171.
  - 2.2 Burlap: Fed. Spec. CCC-C-467.
  - 2.3 Membrane-Forming Compound: ASTM C 309, Type I.
- 3.0 EXECUTION: Concrete shall be cured by protection against loss of moisture and rapid temperature change for a period of not less than 7 days for normal concrete or 3 days for high early strength concrete in accordance with ACI 301 procedures.
  - 3.1 Absorptive cover shall be placed to provide coverage of concrete surfaces and edges, with 4-inch lap over adjacent absorptive covers.
  - 3.2 Horizontal surfaces shall be cured by ponding, by covering with a 2-inch minimum thickness of continuously saturated sand, or by covering with polyethylene sheet, saturated burlap, or waterproof paper.
  - 3.3 Formed surfaces shall be cured by moist curing with forms in place for full curing period. Wooden forms shall be kept wet at all times during curing.
  - 3.4 Unformed surfaces, such as slabs and other flat surfaces, shall be cured by application of appropriate curing compound.
  - 3.5 Membrane-curing compound shall not be applied where a protective coat or waterproofing is to be

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expected.

**Miscellaneous Precast Items**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of miscellaneous precast items. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Precast items shall include, but not be limited to, stairs, planters, picnic tables, including base, seats and tops, handrails, splash blocks, and bumper curbs and shall be supplied by a manufacturer normally engaged in the fabrication of these items.
  - 2.2 Fabrication: PCI MNL-117.
  - 2.3 Each unit shall be complete and self-contained.
  - 2.4 Items shall be fabricated from concrete with a minimum strength of 3,000 psi and shall be reinforced as required to withstand both construction loads and design loads.
  - 2.5 Stairs shall be supplied in complete runs.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Provide anchors, devices, and openings required to install precast units.
    - 3.1.2 Precast units shall be hoisted at points provided by the manufacturer and in manner that avoids damage to the units.
    - 3.1.3 Temporarily brace precast units in proper position and alignment until permanent anchorage and supports are in place.
  - 3.2 Erection:
    - 3.2.1 Anchor units in final position by bolting, welding, grouting, or as otherwise directed. Remove temporary shims, wedges, and spacers as soon as possible after anchoring is completed.
      - 3.2.1.1 At bolted connections, use lock washers or other acceptable means to prevent loosening of nuts.
      - 3.2.1.2 At welded connections, apply rust-inhibitive coating on damaged areas, identical to shop-applied material. Use galvanizing repair coating on galvanized surfaces.
    - 3.2.2 Cleaning: Clean exposed facings to remove dirt and stains that may be on units after erection and completion of joint treatments. Do not use cleaning materials or processes that could change the character of exposed concrete finishes.

**Gypsum Concrete Decks**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of gypsum concrete decks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Gypsum Concrete: ASTM C 317, Class A.
  - 2.2 Formboards:
    - 2.2.1 Sheetrock: ASTM C 36.
    - 2.2.2 Mineral Fiber Board: ASTM C 612.
    - 2.2.3 Cement Fiber Board: ASTM E 1264, Type IX, Fire Class A.
    - 2.2.4 Glass Fiber Board: Lightweight, rigid, composed of pressed glass fibers.
  - 2.3 Bulb Tees: Hot-rolled from high-strength rail steel, ASTM A 499.
  - 2.4 Reinforcing Mesh:
    - 2.4.1 Welded Wire Fabric: ASTM A 185, galvanized, 12 x 48-W 0.5 x W 0.5.
    - 2.4.2 Woven Wire Fabric: ASTM A 82, galvanized, 19 gauge wire, 2-inch hexagonal mesh.
- 3.0 EXECUTION:
  - 3.1 Support System: Sub-purlins shall be spaced to support formboard and rigidly attached to main supports. Formboards shall fit snugly at sub-purlins and at wall, curbs, and openings.

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- 3.2 Reinforcement: Lay wire fabric continuously over subpurlins. Do not lap side of reinforcement.
- 3.3 Gypsum Concrete: Gypsum concrete shall be placed continuously without interruption until entire panel or section is complete. Immediately after placement, screed, level, and trowel smooth.

**Insulating Concrete Roof Decks**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of insulating concrete roof decks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Portland cement: ASTM C 150, Type I or III.
  - 2.2 Aggregate: ASTM C 332, Type I, perlite or vermiculite.
  - 2.3 Water: Clean, potable.
  - 2.4 Admixture: Air-entraining, ASTM C 260.
  - 2.5 Reinforcement: Welded wire fabric, ASTM A 185, galvanized, 12 x 48 - W 0.5 x W 0.5.
- 3.0 EXECUTION:
  - 3.1 Reinforcing Mesh: Place reinforcing mesh at right angles to structural supports, with end laps at least 6 inches and no side laps. Cut to fit around roof openings and projections. Terminate mesh at control joints.
  - 3.2 Place lightweight insulating concrete, using equipment and procedures to avoid segregation of mix and loss of air content. Deposit and screed in a continuous operation until an entire panel or section of roof area is completed. Do not vibrate or work mix except for screeding or floating. Leave top surface in acceptable condition to receive subsequent roofing application.
  - 3.3 Begin Curing Operations immediately after placement, and air cure for not less than 3 days.

**Precast Lightweight Roof Slabs**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of precast lightweight roof deck concrete channels, concrete planks, and gypsum planks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Channel Slabs: Slabs shall be composed of Portland cement and lightweight aggregate with minimum compressive strength 3,750 psi. Legs shall be reinforced with deformed bars; web shall have welded wire fabric reinforcement. Channels shall support a 30 psf live load plus a 20 psf superimposed dead load.
  - 2.2 Planks: Planks shall be composed of Portland cement and lightweight aggregate with a minimum compressive strength of 3,750 psi. Planks shall be reinforced with welded wire fabric. Planks shall support a 30 psf live load plus a 20 psf superimposed dead load.
  - 2.3 Gypsum planks shall be suitable for the intended use, factory-laminated to 2-inch thickness, 2-foot wide panels. Planks shall be continuously supported along sides.
  - 2.4 Subpurlins shall be bulb-tees, hot-rolled from high-strength rail steel, ASTM A 499.
  - 2.5 Grout shall be lightweight concrete or gypsum concrete.
- 3.0 EXECUTION:
  - 3.1 Concrete channels and planks shall be securely attached to support steel or concrete by metal clips or other approved attachments; minimum support bearing shall be 4 inches. Open joints between channels or planks shall be filled with lightweight concrete grout. Planks with tongue and groove edges may not require grouting.
  - 3.2 Gypsum planks shall be snugly fitted between bulb-tee subpurlins. Subpurlins shall be tack-welded or screw-attached to supporting steel or weld bar cast in supporting concrete. Joints at bulb-tees shall be grouted with gypsum grout.

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**Cementitious Wood Fiber Roof Deck Systems**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of cementitious wood fiberboard and tees for roof decks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Cementitious wood fiber planks shall be precast units composed of extra long wood fiber pressure bonded with Portland cement. Plank edges shall be either tongue and groove or rabbeted to receive bulb-tee subpurlins.
  - 2.2 Bulb-Tees: Hot-rolled from high-strength rail steel, ASTM A 499.
  - 2.3 Grout: Lightweight concrete.
- 3.0 EXECUTION:
  - 3.1 Subpurlin System: Planks shall be fitted between bulb-tees. Bulb-tees shall be securely fastened to supporting members. Spaces between planks at subpurlins shall be filled with lightweight concrete grout. Systems of planks and subpurlins shall support a 30 psf live load and a 10 psf superimposed dead load.
  - 3.2 Tongue and Groove System: Planks shall be erected directly on supporting members and securely attached with metal clips or other approved fasteners. The tongue and groove of both ends and sides of plank shall be snugly fitted to eliminate open cracks.

**Grout**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of grout for bases and joints. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Premixed grout shall contain cement, sand, and admixtures to produce a non-shrinking grout with the addition of potable water. Expansion shall be limited to 0.10 percent at 28 days.
    - 2.1.1 Metallic grout shall be non-rusting, containing finely graded metallic aggregate with a compressive strength of 12,000 psi at 28 days.
    - 2.1.2 Non-metallic grout shall have a compressive strength of 13,000 psi at 28 days.
    - 2.1.3 Fluid grout shall be a non-metallic grout with flowable consistency.
  - 2.2.4 Field-Mixed Grout: Grout shall contain 1 part cement to 3 parts sand by volume, with the water content such that a mass of mortar tightly squeezed in the hand will retain its shape but will crumble when disturbed.
- 3.0 EXECUTION:
  - 3.1 Baseplates shall be grouted with non-shrinking grout. Grout shall be placed so that all spaces and cavities below the top of base plates are completely filled without voids. Forms shall be provided where structural components of base plates will not confine the nonshrinking grout.
  - 3.2 Joints shall be filled with field-mixed grout by tamping or ramming with a bar or rod until the joint is completely filled. Grout surface shall be smooth-finished and level with the adjoining material.

**Concrete Restoration and Cleaning**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of concrete. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Epoxy Resin: Two-part epoxy adhesive containing 100 percent solids.
    - 2.1.1 Bond Strength: ASTM C 882, 2,700 psi.
    - 2.1.2 Tensile Strength: ASTM D 638, 6,600 psi.

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- 2.1.3 Elongation: ASTM D 638, two percent.
- 2.1.4 Flexural Strength: ASTM D 790, 8,000 psi.
- 2.1.5 Compressive Strength: ASTM D 695, 10,000 psi.
- 2.2 Bonding Agent: Polyvinyl acetate emulsion, water-resistant when applied and cured.
- 2.3 Concrete:
  - 2.3.1 Portland cement: ASTM C 150.
  - 2.3.2 Sand: ASTM C 33.
  - 2.3.3 Coarse Aggregate: ASTM C 33.
  - 2.3.4 Water: Clean and potable.
  - 2.3.5 Air-Entraining Admixture: ASTM C 260.
  - 2.3.6 Water-Reducing and Retarding Admixture: ASTM C 494.
- 2.4 Cleaning Agent: Commercial muriatic acid, mixed one part to ten parts potable water. •03705
- 2.5 Reinforcing Steel: ASTM A 615, Grade 40 or 60.
- 3.0 EXECUTION:
  - 3.1 Cleaning:
    - 3.1.1 Clean concrete surfaces of dirt, laitance, corrosion, oil, stains, or other contamination. Surface cleaning shall be accomplished by one or more of the following methods as appropriate for the contamination: wire brush using plain water or acid, sandblasting, high pressure steam cleaning with or without chemical additives, high pressure water, high pressure air, or scrub brush and detergent. When acids or chemicals are used, surface shall be thoroughly rinsed and neutralized. Care shall be taken when sandblasting to not etch the surface.
    - 3.1.2 Deteriorated or Spalled Concrete:
      - 3.1.2.1 Completely remove all loose, deteriorated, or unsound concrete down to sound concrete.
      - 3.1.2.2 Where removal Exceeds 1/4 inch or where resurfacing of the entire area is not anticipated, concrete shall be removed to a minimum depth of 2 inches. If cover for reinforcing bars is 2 inches or less, remove concrete to completely expose the reinforcing in the repair area. Remove concrete to a minimum of 1 1/2-inches clear beyond reinforcing. Edges of the repair area shall be cut sharp, perpendicular to the face of the concrete surface, and at least 1 inch deep. Make the perimeter cut with a concrete saw and in a manner to not cut the reinforcing. Clean reinforcing of all rust and scale. Clean repair area of all loose or foreign material using high pressure air or water.
  - 3.2 Resurfacing:
    - 3.2.1 Resurfacing for concrete floors shall be with either epoxy coating or cementitious materials.
      - 3.2.1.1 Epoxy resurfacing shall be applied to a clean hard surface to a minimum thickness of 1/8 inch.
      - 3.2.1.2 Cementitious material resurfacing shall be a minimum of 1 inch thick. Mix shall be one part Portland cement, one part sand, and 1-1/2 parts coarse gravel not exceeding 3/8-inch size crushed rock. Apply bonding compound and immediately place new surfacing. Curing shall be by burlap blanket method. Blankets shall be kept thoroughly saturated and in intimate contact with the concrete.
    - 3.2.2 Resurfacing of Columns: Resurfacing of spalled or deteriorated column surfaces shall be with epoxy grout prepared with the addition of sand to epoxy resin to obtain a mix consistency that will not sag when placed in thin layers on vertical surfaces. Trowel finish.
  - 3.3 Concrete Rehabilitation:
    - 3.3.1 Concrete Patching:
      - 3.3.1.1 Surface shall be prepared as specified for deteriorated concrete cleaning.
      - 3.3.1.2 Any existing reinforcing bars that have a loss of more than 25 percent of their cross section through corrosion shall be replaced. Clean reinforcing bars by sandblasting or wire brushing.
      - 3.3.1.3 Patch with Portland cement concrete if average patch thickness is 2 inches or greater; if less than 2 inches, patch with epoxy grout. Use bonding compound when placing Portland cement concrete patch.
    - 3.3.2 Crack Repair:
      - 3.3.2.1 Epoxy Resin Adhesive Injection: Provide temporary surface seal on crack with entry ports spaced equal to the approximate thickness of the concrete. Inject adhesive into ports under pressure. Continue from port to port until crack is filled, working from bottom to top. Remove temporary seal and clean surface.

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- 3.3.2.2 Epoxy Grout: The crack shall be cut out at the surface in a V-shape that extends to approximately 2 to 3 inches in width. Thoroughly blow out crack with high pressure air and wet with clean water. Completely fill the crack beyond the V-shaped portion with epoxy grout. The mix shall be thin enough to run freely into the crack for horizontal surfaces. Vertical cracks shall require a stiff mix tamped into place to fill all voids. Trowel finish.

**Bridge Piers, Abutments and Anchors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for the repair and maintenance of bridge piers, piles, caissons footings, abutments, and anchors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Treated Timber Piles: Comply with the state's standard specifications.
- 2.2 Steel H-Piles: ASTM A 36.
- 2.3 Steel Pipe Piles: ASTM A 252, Grade 1.
- 2.4 Precast Reinforced Concrete Piles: Comply with the state's standard specifications.
- 2.5 Precast Prestressed Concrete Piles: Comply with the state's standard specifications.
- 2.6 Steel Sheet Piling: ASTM A 328.
- 2.7 Wales, Plate Washers, and Tie Rods: ASTM A 36.
- 2.8 High Strength Steel Bolts, Nuts, and Washers: ASTM A 325.
- 2.9 Electrodes: AWS A5.1 or AWS A5.5.
- 3.0 EXECUTION:
- 3.1 Preparation:
- 3.1.1 Traffic Control: When traffic is maintained on bridge under repair or is directed over a temporary run-around, furnish, erect, and maintain all barricades, flags, torches, lights, guardrails, temporary pavement markings, and traffic control signs required for the protection of the public and for the direction of traffic. Number, type, color, size, and placement of all traffic control devices and the use of a flagman shall comply with USDOT FHA MUTCD "Traffic Controls for Highway Construction and Maintenance Operations." All traffic control devices in advance of the construction limits shall also be the responsibility of the Contractor.
- 3.1.2 Clearing and Dewatering: Scalp the area around timber pile bents and abutments. Remove from the vicinity all weeds and bushes as necessary to eliminate fire hazards. Keep work areas clear of water by using cofferdams, diversion channels, or other approved methods. Submit details of methods to be used to the Authorized Member Representative for approval prior to beginning work.
- 3.2 Maintenance and Repair Methods:
- 3.2.1 General: Preparation for pile driving, penetration of piles, tolerance in driving, splicing of piles, cut-offs, determination of bearing values, treatment of pile heads, and test piles shall comply with the state's standard specifications and these specifications. Drive new pile in the location and batter as directed. Pile shall not be pulled into location after driving.
- 3.2.2 Existing Timber Piles: Replace or repair decayed portions of piles as directed.
- 3.2.3 Existing Steel Piles: Remove corroded material by sandblasting or wire brushing. Strengthen the web and flanges of the corroded section by the addition of structural carbon steel or high strength steel and encase the piles in Class A concrete.
- 3.2.4 Caissons and Piers: Construct new caissons and piers in compliance with the Recommended Specifications of the Association of Drilled Shaft Contractors, Inc.
- 3.2.5 Footings: Repair spalling and rounding off of side spaces, transverse cracks, and deteriorated concrete as directed. Install additional reinforcing and drilled anchors where required. Provide formwork as required to restore concrete to its original shape to the extent practicable. New concrete shall cure at least 3 days prior to removal of forms and restoration of the stream channel to its proper course.
- 3.2.6 Concrete Abutments, Pile Bents, Walls, and Piers: Repair spalling, scaling, and pop-outs as directed. Remove concrete to a depth of 1-1/2 inches minimum clear distance behind the layer of reinforcing. Install additional reinforcing and drilled anchor rods as required. Replace concrete as

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described above for footings.

- 3.2.7 Bearing Seats: Remove all debris from around bearings and bearing seats. Widen bearing seat and repair spalling, scaling, and pop-outs as directed. New concrete that will be in direct contact with a bearing shall be 4,000 psi concrete with 4 to 6 percent entrained air and 4 inch maximum slump if patch thickness is greater than 4 inches or non-shrink grout if patch thickness is less than 4 inches.
- 3.2.8 Steel Piers, Pile Abutments, Walls, and Pile Bents: Remove corroded material by sandblasting or wire brushing. Strengthen plates and shapes of corroded sections by the addition of structural carbon steel or high strength steel. Reweld or bolt loose connections as directed. Remove and replace loose bolts or rivets.
- 3.2.9 Repair of Displaced Sheet Pile: Remove displaced sheet pile and drive new pile in position of the original pile before it became displaced. Remove and replace deteriorated backing material. Backing material shall be approved by the Authorized Member Representative. Where directed, drive new sheet piling and add backing material in the void between old and new sheet piling.
- 3.2.10 Anchorage System: Repair tie rods and deadmen as directed.

**Concrete Bridge Components**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of concrete bridge components. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Portland cement: ASTM C 150, Type I or Type III.
  - 2.2 Air-entraining Admixtures: ASTM C 260.
  - 2.3 Water-Reducing and Retarding Admixtures: ASTM C 494.
  - 2.4 Water: Potable water, free from injurious amounts of oil, acid, salt, alkali, organic matter, or other deleterious substances.
  - 2.5 Aggregate: ASTM C 33.
  - 2.6 Concrete Curing Materials:
    - 2.6.1 Membrane Curing Compound: Comply with ASTM C 309, Type I. Curing compound shall not be used where bituminous concrete surfaces will be added unless certified not to affect adherence of the surface.
    - 2.6.2 Vapor Barrier: A .004-inch thick polyethylene film complying with ASTM C 171.
    - 2.6.3 Burlap: Fed. Spec. CCC-C-467.
  - 2.7 Reinforcement:
    - 2.7.1 Reinforcement Bars: ASTM A 615, Grade 40 or 60.
    - 2.7.2 Welded Wire Fabric: ASTM A 185 for plain fabric; ASTM A 496 for deformed wire fabric.
    - 2.7.3 Accessories: Comply with CRSI "Manual of Standard Practice of Reinforced Concrete Construction."
    - 2.7.4 Prestressing Steel Strand: ASTM A 416, Grade 250.
  - 2.8 Formwork:
    - 2.8.1 Form Ties: Watersealing snap-in type with a minimum working strength of 3,000 psi.
    - 2.8.2 Plywood for Forms and Liners: DOC PS 1, minimum grade B-B High Density Concrete Form Overlay, Class I.
    - 2.8.3 Formwork Lumber: Straight and clean. All nails shall be withdrawn and surfaces in contact with concrete shall be thoroughly cleaned before reuse.
  - 2.9 Epoxy Bonding Compound: A 100 percent solids, moisture insensitive, epoxy resin system complying with Fed. Spec. FF-G-450.
  - 2.10 Concrete Sealer: A colorless liquid complying with Fed. Spec. TT-C-800.
  - 2.11 Poured Joint Sealers:
    - 2.11.1 Cold-Poured Joint Sealer: CE CRD-C-527.
    - 2.11.2 Hot-Poured Joint Sealer: AASHTO M173.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 General: Provide scaffolding, falsework, and cofferdams as required for access to the work.

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- 3.1.2 Traffic Control: When traffic is maintained on bridge under repair or is directed over a temporary run-around, furnish, erect, and maintain all temporary pavement markings and traffic control signs required for the protection of the public and for the direction of traffic. Number, type, color, size, and placement of all traffic control devices and the use of a flagman shall comply with USDOT FHA MUTCD "Traffic Controls for Highway Construction and Maintenance Operations." All traffic control devices in advance of the construction limits shall also be the responsibility of the Contractor.
- 3.1.3 Formwork: ACI 347 and ACI 318. Use plywood or metal forms for exposed surfaces. All exposed external corners of concrete shall be chamfered.
- 3.1.4 Reinforcement:
  - 3.1.4.1 Fabrication: ACI 315 and ACI 318.
  - 3.1.4.2 Cover: Concrete protection for reinforcement shall comply with AASHTO Standard Specifications for Highway Bridges, Section 1.5.6.
- 3.1.5 Concrete Mixtures:
  - 3.1.5.1 General: The proportions of cement, aggregate, and water shall be selected by the Contractor in compliance with ACI 318 to provide a plastic and workable mix. Concrete shall be mixed in compliance with ASTM C 94. Concrete not otherwise indicated shall be Class A Concrete. Final mix proportions shall be subject to the approval of the Authorized Member Representative.
  - 3.1.5.2 Class A concrete shall have a strength of 4,000 psi after 28 days and a maximum slump of 4 inches. Concrete shall contain 7 bags cement per cubic yard and 4 to 6 percent entrained air by volume.
  - 3.1.5.3 Class B concrete shall have a strength of 4,000 psi after 28 days, contain 8 bags of cement per cubic yard, and have a maximum slump of 4 inches. Concrete shall be 3/8 inch maximum aggregate size and contain 6 to 9 percent entrained air by volume.
  - 3.1.5.4 Class C concrete shall have a strength of 4,000 psi after 28 days, contain 8 bags of cement per cubic yard, and have a maximum slump of 4 inches. Concrete shall be 1-1/2 inch maximum aggregate size and contain 6 to 9 percent entrained air by volume.
  - 3.1.5.5 Patching mortar shall be a mix of 1 part cement and 2 parts fine aggregate.
  - 3.1.5.6 Grout for bonding new concrete to old shall consist of equal parts by weight of Portland cement and sand, mixed with sufficient water to form a stiff slurry.
  - 3.1.5.7 Non-shrink grout shall have a strength of 9,000 psi after 28 days. Mixtures to be placed in excess of 1 inch thick may include 3/8 inch pea gravel.
- 3.2 Installation:
  - 3.2.1 Placing Concrete:
    - 3.2.1.1 Deposit concrete as close as practicable to its final position to avoid segregation of materials. Do not retemper or remix concrete that has reached its initial set.
    - 3.2.1.2 Under Water: All concrete deposited under water shall be mixed in the proportions specified except that 10 percent additional cement shall be used in the mix. Concrete deposited under water shall be placed in still water and shall be carefully placed in its final position by means of a tremie and shall not be disturbed after being deposited. The tremie shall consist of a 10 inch or larger watertight tube. The discharge end shall be kept below the top of the deposited concrete until the batch is discharged. The flow shall be continuous and in no case shall be interrupted until the work is complete.
  - 3.2.2 Consolidating Concrete: Where practicable, thoroughly compact concrete with internal vibrators having a frequency of 8,000 vibrations per minute. Do not laterally move concrete with the vibrator. Where vibrators cannot be used, hand spade or rod concrete. Do not vibrate concrete placed under water.
  - 3.2.3 Protection and Curing: Concrete shall be cured for not less than 7 days for normal concrete or 3 days for high early strength concrete. Comply with ACI 305 and ACI 306 for protecting and curing concrete in hot and cold weather.
  - 3.2.4 Tests:
    - 3.2.4.1 Compressive Strength: Secure two specimens for each day's pour in compliance with ASTM C 172. Laboratory cure the specimens in compliance with ASTM C 31. Make compressive strength tests at the ages of 7 and 28 days in compliance with ASTM C 39.
    - 3.2.4.2 Slump Tests: Make two slump tests each day. Tests shall comply with ASTM C 143.

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- 3.2.4.3 Air Entrainment Tests: Make two air entrainment tests each day. Tests shall comply with ASTM C 231.
- 3.3 Maintenance and Repair Methods:
- 3.3.1 Repair of Deteriorated Concrete:
- 3.3.1.1 Remove deteriorated or unsound concrete down to sound concrete and to a minimum depth of 2 inches. If cover for reinforcing bars is 2 inches or less, remove concrete to completely expose the reinforcing in the repair area. Remove concrete to a minimum of 1-1/2 inches clear beyond reinforcing. Edges of the repair area shall be cut sharp, perpendicular to the face of the concrete surface, and at least 1 inch deep. Clean reinforcing of all rust and scale. Clean repair area of all loose or foreign material.
- 3.3.1.2 Formwork shall be of such size and shape to restore the original lines of the structure. If jacketing is used for repair of deteriorated columns, piers, or piling, jacket forms shall be held in position by spacers and bands.
- 3.3.1.3 Provide bonding coat of either epoxy-resin or Portland cement mortar bonding course.
- 3.3.1.4 Patch with Class A concrete if average patch thickness is 4 inches or greater; use Class B concrete if average patch thickness is less than 4 inches.
- 3.3.2 Repair of Transverse Cracks: Cut the crack in the shape of a "V" at the surface to approximately 2 to 3 inches wide. Completely fill the crack beyond the V-shaped portion with an epoxy bonding compound or epoxy grout. Apply epoxy bonding compound to the V-shaped portion of the crack and fill with a stiff mix of patching mortar.
- 3.3.3 Patching PCC Bridge Deck:
- 3.3.3.1 Saw cut along all areas to be patched not bounded by existing joints. Cuts shall be vertical and at right angles to the pavement. Make cuts to a depth of 3/4 inch or the top of reinforcing, whichever is less.
- 3.3.3.2 Completely remove loose and unsound concrete in the patch area. In no case remove less than 3/4 inch. Exercise care to prevent injury to load transmission devices, tie bars, or adjacent concrete to remain in place.
- 3.3.3.3 Reinforcing: All existing reinforcement bars shall remain in place except any existing reinforcing bars that have a loss of more than 25 percent of their cross section through corrosion shall be replaced.
- 3.3.3.4 Provide bonding coat of either epoxy-resin or Portland cement grout bonding course to all surfaces of existing concrete is to be in contact with new concrete.
- 3.3.3.5 After the grout bonding course has been applied, place Class B concrete in patches less than 2 inches deep and Class C concrete in patches 2 inches or deeper. Consolidate concrete. Finish the concrete to the elevation of the adjacent surface. The surface of the new concrete shall be broomed to produce a light, corrugated texture.
- 3.3.3.6 Cure the concrete by the burlap blanket method, AASHTO M182. Do not apply a waterproofing membrane or overlay until concrete has been allowed to dry 3 days after completion of curing.
- 3.3.4 Sealing Cracks and Joints in PCC Bridge Deck: Remove excess existing bituminous sealer, dirt, stones, or other foreign matter from the concrete surface along cracks and joints. The sealing material shall be placed so that joints are completely filled from the bottom to top. Place sufficient compound in the joint so that the compound will be flush with the surface of the adjacent surfacing upon completion of the pouring operation. Dust the sealant lightly with Portland cement, finely pulverized limestone dust, pulverized calcium carbonate, calcium silicate, or other finely divided inert material or cover with a tape that will adhere to the concrete.

**DIVISION 4-MASONRY**

**Unit Masonry**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of facing brick, concrete block, glazed concrete unit masonry, sound-absorbing unit masonry, clay wall tile, sound-absorbing structural glazed tile, glass unit masonry, and vitrified clay flue liners. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations.

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Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Facing Brick:

2.1.1 Facing brick units shall be of standard size, texture, and color and shall conform to ASTM C 216, Grade SW.

2.1.2 Glazed brick units shall be of standard size and color and shall conform to ASTM C 216, Grade S.

2.2 Concrete Block:

2.2.1 Solid Load-Bearing Concrete Block: ASTM C 145.

2.2.2 Hollow Load-Bearing Concrete Block: ASTM C 90.

2.2.3 Nonload-Bearing Concrete Block: ASTM C 129, Type I.

2.2.4 Patterned concrete block: compatible with existing in dimension and appearance.

2.2.5 Architectural or decorative concrete block: split face units shall be hollow concrete masonry units conforming to the applicable requirements of ASTM C90. Color, pattern, and texture shall be compatible with existing or as selected by the Authorized Member Representative.

2.3 Glazed Concrete Unit Masonry:

2.3.1 Factory-applied, pre-faced, concrete masonry units shall be of standard shapes and sizes conforming to ASTM C 90, Grade N or Type 1.

2.3.2 Facing components shall conform to ASTM C 744.

2.3.3 Units shall be smooth and colored with satin gloss finish.

2.4 Sound-Absorbing Unit Masonry:

2.4.1 Sound-absorbing masonry units shall be of standard shapes and sizes conforming to ASTM C 90 or ASTM C 129, as applicable.

2.4.2 Slots in the masonry unit cavities shall be narrow slots in empty cavities or wide slots with fibrous fillers in cavities, as applicable, for desired sound transmission absorption.

2.4.3 Prefinished units shall have ground-face or glazed surface.

2.5 Clay Wall Tile:

2.5.1 Load-Bearing Wall Tile hollow units shall be of standard shapes and sizes conforming to ASTM C 34, Grade LB or LBX.

2.5.2 Nonload-bearing wall tile shall be of standard shapes and sizes conforming to ASTM C 56, Grade NB.

2.5.3 Clay wall tile color shall conform to ASTM C 212 or ASTM C 126.

2.5.4 Plaster base Finish shall conform to ASTM C 34 and ASTM C 56.

2.6 Sound-Absorbing Structural Glazed Tile: Sound-absorbing tile units shall be of standard shapes and sizes conforming to ASTM C 212 or ASTM C 126. The required Sound Transmission Class (STC) shall be in accordance with ASTM E 90.

2.7 Glass Unit Masonry:

2.7.1 Glass block hollow units shall be classified for 3/4 hour of fire exposure in accordance with UL Fire Exposure Classification 9 (UL-9): "Fire Test for Window Assemblies."

2.7.2 Insulation R-values for the following unit face sizes shall be: 6 inches by 6 inches equals R-2; 8 inches by 8 inches equals R-1.96; and 12 inches by 12 inches equals R-1.92.

2.7.3 Unit face pattern shall be of a standard design to provide desired light transmission, brightness, and privacy.

2.7.4 Mortar shall be Type S in accordance with ANSI A41.1 and ASTM C 270.

2.8 Refractories: Vitriified clay flue lining shall be rectangular, round, or modular, of standard sizes, and shall conform to ASTM C 315.

2.9 Mortar Materials and Mixing:

2.9.1 Hydrated Lime: ASTM C 207, Type S or N.

2.9.2 Admixtures: Fed. Spec. SS-C-1960/1 and consisting of water-repellant stearates and pozzolanic plasticizers in powder form.

2.9.3 Portland cement shall comply with ASTM C 150, Type I or II. Masonry cement shall comply with ASTM C 91.

2.9.4 Coarse aggregate for masonry grout shall comply with ASTM C 404. Do not use aggregate containing any substance that will stain masonry.

2.9.5 Sand shall comply with ASTM C 144 or ASTM C 33, paragraph 3.1.

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- 2.9.6 Mortar shall comply with ASTM C 270 and in the proportions, measured in parts by volume, as required for the application.
- 2.10 Masonry Accessories:
  - 2.10.1 Reinforcement bars for lintels, bond beams, pilasters, and other masonry reinforcement shall comply with ASTM A 615, Grade 40.
  - 2.10.2 Joint reinforcement shall be prefabricated from zinc-coated cold drawn steel wire complying with ASTM A 641, Class 2 or 3 coating. Side wires shall be 8-gauge deformed wire; truss rods shall be 9-gauge smooth or deformed wire. 2.10.3 Wire-Mesh Ties shall be 16-gauge or larger diameter, zinc-coated steel wire woven into 1/2-inch mesh and cut into strips 1 inch narrower than the width of walls in which they are used. Zinc-coated wire shall comply with ASTM A 641, Class 2 or 3 coating.
  - 2.10.4 Rigid steel anchors shall be a minimum of 1 inch x 1/4 inch x 26 inches long with each end turned up not less than 2 inches. Anchors shall be zinc-coated complying with ASTM A 123.
  - 2.10.5 Seals and gaskets for control and expansion joint shall be of closed cell natural or synthetic rubber.
- 2.11 Water-repellent materials for concrete block shall be solvent type silicone complying with Fed. Spec. SS-W-110; transparent, nonstaining, 5 percent silicone resin.
- 3.0 EXECUTION:
  - 3.1 Water repellent application shall be spray or brush in a single coat, using not less than one gallon for each 80 square feet covered. A flood coating with a rundown of material on the surface of from 6 inches to one foot shall be produced.

**Scaffolding - Tubular Steel**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of tubular steel scaffolding. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Tubular steel or aluminum scaffolding system shall comply with OSHA Safety and Health Standards, Section 29 CFR, 1926/1910.
- 3.0 EXECUTION: (Section not used.)

**Brickwork**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of brickwork. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Face Brick: Compatible with existing in mechanical characteristics, permeability, and appearance and shall comply with ASTM C 216.
  - 2.2 Common Brick: Compatible with existing in mechanical characteristics, permeability, and appearance and shall comply with ASTM C 62.
  - 2.3 Concrete Brick: ASTM C 55.
  - 2.4 Mortar Materials and Mixing:
    - 2.4.1 Hydrated Lime: ASTM C 207, Type S or N.
    - 2.4.2 Admixtures: Fed. Spec. SS-C-1960/1 and consisting of water-repellent stearates and pozzolanic plasticizers in powder form.
    - 2.4.3 Portland cement shall comply with ASTM C 150, Type I or II. Masonry cement shall comply with ASTM C 91.
    - 2.4.4 Coarse aggregate for masonry-grout shall comply with ASTM C 404. Do not use aggregate containing any substance that will stain masonry.
    - 2.4.5 Sand shall comply with ASTM C 144.
    - 2.4.6 Colored masonry cement shall be a factory formulated mixture complying with Fed. Spec. SS-C-1960/1.
    - 2.4.7 Mortar shall comply with ASTM C 270 and in the proportions, measured in parts by volume, as

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required for the application.

2.5 Masonry Accessories:

- 2.5.1 Reinforcement bars for lintels, bond beams, pilasters, and other masonry reinforcement shall comply with ASTM A 615, Grade 40.
- 2.5.2 Joint reinforcement shall be prefabricated from zinc-coated, cold drawn steel wire complying with ASTM A 641, Class 2 or 3 coating. Side wires shall be 8-gauge deformed wire; truss rods shall be 9-gauge smooth or deformed wire.
- 2.5.3 Wire-mesh ties shall be 16-gauge or larger diameter, zinc-coated steel wire woven into 1/2-inch mesh and cut into strips 1 inch narrower than the width of walls in which they are used. Zinc-coated wire shall comply with ASTM A 641, Class 2 or 3 coating.
- 2.5.4 Rigid steel anchors shall be a minimum of 1 inch x 1/4 inch x 26 inches long with each end turned up not less than 2 inches. Anchors shall be zinc-coated complying with ASTM A 615, Class 2 or 3.
- 2.5.5 Seals and gaskets for control and expansion joint shall be of closed cell natural or synthetic rubber.
- 2.5.6 Nylon Rope for weep holes shall be 3/8 inch diameter by 12 inches long.
- 2.5.7 Wire brick ties shall be fabricated from 3/16-inch diameter zinc-coated steel wire conforming to ASTM A 641, Class 2 or 3 coating. Ties shall be at least 4 inches wide and embedded 4 inches into backup material.

2.6 Flashing:

2.6.1 Through-wall flashing shall be one of the following:

- 2.6.1.1 Five-ounce copper sheet shall comply with ASTM B 370, cold-rolled temper, coated both sides with a factory-applied elastic asphalt compound complying with ASTM D 449.
- 2.6.1.2 Ten-ounce rib-formed copper sheet shall comply with ASTM B 370, cold-rolled temper, with ribs approximately 3/16-inch high and spaced not more than 3 inches apart.
- 2.6.1.3 Rib-formed 32-gauge, Type 302 or 304 stainless steel sheet shall comply with ASTM A 167. Deformations shall be approximately 3/16 inch high and shall be spaced not more than 3 inches apart.

2.6.2 Flashing beneath coping stone shall be one of the following:

- 2.6.2.1 Stainless steel sheet shall comply with ASTM A 167, Type 302 or 304, finish No. 2P, dull, 26-gauge.
- 2.6.2.2 Copper sheet shall comply with ASTM B 370, cold-rolled temper, 16-ounce per square foot.
- 2.6.2.3 Aluminum-sheet shall comply with ASTM B 209, alloy 3003, temper H-14, .032 inch thick.
- 2.6.2.4 Galvanized steel Sheet, 26-gauge, shall comply with ASTM A 527, and coating shall comply with ASTM A 525, designation G90.

2.7 Caulking and sealants shall comply with Fed. Spec. TT-S-00227, Type II, Class A or Fed. Spec. TT-S-00230, Type II, Class A.

2.7.1 Backup material for sealants shall be closed-cell resilient urethane or polyvinyl-chloride foam, closed-cell polyethylene foam, closed-cell sponge of vinyl or rubber, polychloroprene tubes or beads, polyisobutylene extrusions, oilless dry jute, or rope yarn.

2.7.2 Bond preventative material shall be pressure sensitive polyethylene tape, aluminum foil, or wax paper.

2.8 Water-repellent materials for facing brick masonry shall be solvent type silicone complying with Fed. Spec. SS-W-110; transparent, nonstaining, 5 percent silicone resin.

3.0 EXECUTION:

3.1 Brick shall be laid with completely filled mortar joints in line with and of equal width to existing jointing.

3.2 3/8-inch nylon weep rope, 24 inches apart, shall be provided in the head mortar in the first course above the top of steel lintels, shelf angles, and ledge supports and where flashings and waterproofing terminate in horizontal joints. 3.3 Water Repellent Application shall be spray or brush in a single coat, using not less than one gallon for each 100 square feet covered. A flood coating with a rundown of material on the surface of from 6 inches to one foot shall be produced.

**Exposed Aggregate Surface Concrete Walls**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of exposed aggregate surface concrete walls. Products shall match existing materials and/or shall be as

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directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Concrete Materials and Mixing:

2.1.1 Portland cement: ASTM C 150, Type I or IA.

2.1.2 Shrinkage-Compensating Cement: Portland cement containing a stable expansive chemical compound such as calcium sulfoaluminate.

2.1.3 Aggregate: ASTM C 33; aggregate for exposed aggregate concrete shall match existing, if appropriate.

2.1.4 Admixtures: Submit manufacturer's literature for all fixtures proposed for the work.

2.1.5 Curing Compounds: ASTM C 309, Type 1.

2.1.6 Epoxy Bonding Agent: ASTM C 932.

2.2 Concrete Formwork, Reinforcement, and Accessories:

2.2.1 Formwork: plywood form and liners shall be minimum grade B-B High Density Concrete Form Overlay, Class I, complying with APA.

2.2.2 Reinforcement:

2.2.2.1 Reinforcement Bars: ASTM A 615, Grade 40 or Grade 60.

2.2.2.2 Welded Wire Fabric: ASTM A 185. Where welded wire fabric is needed, use No. 6 gauge wire at 6-inch spacing in each direction.

2.2.2.3 Accessories for proper installation of reinforcement shall comply with CRSI "Manual of Standard Practice for Reinforced Concrete Construction."

2.2.2.4 Reinforcement fabrication shall comply with ACI 318 and ACI 315.

2.3 Curing and Climatic Conditions:

2.3.1 Comply with ACI 306 and ACI 305 for protecting and curing concrete in cold and hot weather.

2.3.2 Immediately after finishing, begin curing slatwork by covering with constantly saturated moisture retaining fabrics, impervious sheeting, or membrane curing compounds.

2.3.3 Apply membrane curing compounds as required.

3.0 EXECUTION:

3.1 Preparation when attaching to existing surfaces:

3.1.1 Remove all defective material by chipping and cutting to sound concrete in order to secure a solid foundation.

3.1.2 Square cut or undercut the edges to a minimum depth of one inch to form a key.

3.1.3 Cut concrete out from behind exposed reinforcing bars and rods.

3.1.4 All exposed reinforcing shall be cleaned of rust and primed.

3.2 Installation:

3.2.1 Formwork Requirements:

3.2.1.1 Formwork shall comply with ACI 347. Joints in forms shall be horizontal or vertical.

3.2.1.2 Use plywood, fiberglass, or metal forms.

3.2.2 Reinforcement shall be repaired when rusted through. Rods at least 12 inches long shall be wired to the failed rods. In closing gaps, rods shall lap existing rods by at least 12 inches or 30 diameters, whichever is greater.

3.2.3 Mixing and Transporting Concrete: Ready-mixed concrete shall be mixed and delivered to the project in compliance with ASTM C 94. Job-mixed concrete shall comply with the requirements of ACI 318.

3.2.4 Mixing Epoxy-Resin Patching Mortar: Mix thoroughly with a power mixer at low speeds (150 - 400 rpm) until material attains uniform color and consistency (minimum time of two to three minutes at 70 F).

**Terra Cotta**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of terra cotta. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

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2.0 PRODUCTS:

- 2.1 Terra Cotta: Hard-burned, nonload-bearing clay building units.
  - 2.2 Material for Setting Terra Cotta:
    - 2.2.1 Cement shall be Portland cement complying with ASTM C 150, Type I or Type IA.
    - 2.2.2 Sand for mortar shall be tested in compliance with ASTM C 40 and C 117. Sand shall have a fineness modulus between 2.0 and 2.5.
    - 2.2.3 Lime shall comply with ASTM C 5.
    - 2.2.4 Hydrated lime, if allowed, shall comply with ASTM C 206.
  - 2.3 Mortar for the resetting of terra cotta shall be composed of one part Portland cement, 3 1/2 parts sand, and 1/2 part lime putty by volume.
- 3.0 EXECUTION:
- 3.1 Restoration of Terra Cotta Surface:
    - 3.1.1 Remove all loose chips or flaking pieces from the surface. Cut mortar out of all joints to a depth of 3/8 inch from the face of the terra cotta.
    - 3.1.2 Build up voids and Irregularities in the surface using successive coats of an epoxy caulk consisting of a 2-component 100 percent flexible-cured, thixotropic epoxy suitable for vertical surfaces.
    - 3.1.3 Give all patched surfaces of the terra cotta two coats of an epoxy glaze consisting of 2-component, 100 percent epoxy, high-solids content, flexible cured, interior-exterior, high-gloss glaze.
  - 3.2 Replacement of Terra Cotta:
    - 3.2.1 Terra cotta units required to be replaced shall be carefully removed to avoid disturbing adjacent units.
    - 3.2.2 Set replacement units plumb, level, true to line, and in a manner to match existing terra cotta.
  - 3.3 Sealing Terra Cotta Joints:
    - 3.3.1 Remove joint material to a depth of 3/8 inch or to the depth of sound material.
    - 3.3.2 Clean the joints thoroughly.
    - 3.3.3 RegROUT joints and tool surface to match appearance of adjacent floor.

**Stonework**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of stonework. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Indiana Limestone: ASTM C 568, Category II.
  - 2.2 Field Stone: Compatible with existing.
  - 2.3 Marble: ASTM C 503.
  - 2.4 Building Sandstone: Compatible with existing.
  - 2.5 Structural Granite: ASTM C 615.
  - 2.6 Masonry Accessories:
    - 2.5.1 Fastenings for Stone: Furnish and install all anchors, dowels, clamps, clips, bolts, and other attachments necessary to fasten and anchor stone in place. Steel wire shall be zinc-coated in compliance with ASTM Specification A 641 for Class 2 coating. Stainless steel shall be used to fabricate the sizes, shapes, and types of all anchoring and fastenings, except wire.
    - 2.5.2 Slots for dovetail anchors shall be of 24-gauge commercial galvanized sheet metal, formed to give double anchorage for shoulder to forms.
    - 2.5.3 Dovetail anchors for fastening masonry to concrete shall be compatible with anchor slots.
  - 2.6 Epoxy Mortar Patching Materials:
    - 2.6.1 Epoxy Adhesive shall be a two-component epoxy consisting of epoxy resin and hardener and complying with the following performance requirements:
      - 2.6.1.1 Tensile Elongation: 2.5 percent minimum per ASTM D 638.
      - 2.6.1.2 Tensile Strength: 3,500 psi minimum per ASTM D 638.
      - 2.6.1.3 Compressive Strength: 6,000 psi minimum per ASTM D 695.
      - 2.6.1.4 Water Absorption (24 hours): 0.5 percent ASTM D 570.
    - 2.6.2 Stone filler shall be stone of the same type and color as the stone being patched and shall be

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- ground to approximately the texture of coarse sand.
- 2.6.3 Pigments shall be of the type that will not react with the epoxy adhesive.
- 2.6.4 Thickening powder shall be silicon carbide powder or asbestos powder.
- 3.0 EXECUTION:
- 3.1 Preparation:
  - 3.1.1 Removal of Deteriorated Material: Chip out all deteriorated stone in areas to be patched to sound material. Square cut or undercut edges to a minimum 1-inch depth to form a key for patching material.
  - 3.1.2 Cleaning: Clean area to be patched and dry thoroughly.
- 3.2 Installation:
  - 3.2.1 Patching Stone:
    - 3.2.1.1 Within 30 minutes after mixing epoxy adhesive, apply mortar to the area to be patched. Build up mortar beyond the adjacent surface to allow grinding to match existing surface textures. 3.2.1.2 Allow patching mortar to cure for a minimum of 24 hours before grinding or chiseling.
  - 3.2.2 Replacing Stone:
    - 3.2.2.1 Cut replacement stone accurately to shape and dimensions with joints and bonding as required.
    - 3.2.2.2 Exterior sill stones, panels, copings, cornice, and similar stones with exposed top surfaces shall be cut to set on their natural beds and shall have a wash on the top surface.
  - 3.2.3 Setting Stone:
    - 3.2.3.1 Where stone is backed up with concrete or concrete blocks, coat the face of the backup material with an approved non-staining asphalt complying with ASTM D 449, Type D.
    - 3.2.3.2 Provide expansion or control joints in stonework as required.
    - 3.2.3.3 Install pressure sensitive polyethylene tape or aluminum foil bond breaker complying with Fed. Spec. QQ-A-1876, prime edges of stone, and fill remainder of joint with caulking and sealing compound.
  - 3.2.4 Pointing and Cleaning:
    - 3.2.4.1 Upon completion, all joints shall be carefully pointed.
    - 3.2.4.2 Clean stone surfaces using fiber brushes and trisodium phosphate solution.

**Masonry Restoration**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for general masonry restoration. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Abrasive blasting material shall be a combination of friable, finely graded, clean particles, containing approximately 97.8 percent silicates and other minerals by weight. The material shall contain no free silica nor any crushed or quarried sand.
    - 2.1.1 Sieve analysis for wet blasting aggregate shall be:

Sieve Mesh (Percent Retained)	Min.	Max.
28	5	1
35	22	32
48	73	90
    - 2.1.2 Aggregate for Dry Blasting: The size of aggregate for dry blasting shall be determined by careful material analysis for the given application.
  - 2.2 Mortar Materials:
    - 2.2.1 Hydrated Lime: ASTM C 207, Type S or N.
    - 2.2.2 Cement:
      - 2.2.2.1 Portland cement: ASTM C 150, Type I or II.
      - 2.2.2.2 Masonry Cement: ASTM C 91.
      - 2.2.2.3 Cement shall not have more than 0.60 percent alkali (sodium oxide) nor more than 0.15 percent water soluble alkali in the combination of lime and cement.
    - 2.2.3 Aggregate:

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- 2.2.3.1 Coarse Aggregate: ASTM C 404 and not containing any substance that will stain the masonry.
- 2.2.3.2 Sand for Use with Masonry: ASTM C 144. Sand shall not contain any substance that will stain masonry.
- 2.2.3.3 Sand for Use with Stone: ASTM C 33.
- 2.2.4 Admixtures: Fed. Spec. SS-C-1960/1 consisting of water-repellent stearates and pozzolanic plasticizers in powder form. Salt, anti-freeze liquid, accelerator, or other admixtures shall not be used.
- 2.2.5 Colored Masonry Cement: Fed. Spec. SS-C-1960/1, Type II. Mortar colors shall be high purity, chemically inert, color-fast, and alkali-proof mineral oxides. Color shall not exceed 15 percent of the cement weight; carbon black shall not exceed 3 percent of the cement weight.
- 2.2.6 Water shall be clean, fresh, and free from injurious amounts of oil, acid, salt, alkali, organic matter, or other deleterious substances.
- 2.2.7 Mortar proportions shall be as follows:

Portland	Hydrated	
Cement	Lime	Sand
1	1	6

Add pigments if required.
- 2.3 Grout: Grout shall be a flexible, non-shrink, non-staining grout specifically formulated for use in masking and grouting.
- 2.4 Masking material shall be a special masking tape, compatible with the grout technique.
- 2.5 Caulking and Sealants shall comply with Fed. Spec. TT-S-00227, Type II, Class A or Fed. Spec. TT-S-00230, Type II, Class A.
- 2.6 Backup material for sealants shall be closed-cell resilient urethane or polyvinyl-chloride foam, closed-cell polyethylene foam, closed-cell sponge of vinyl or rubber, polychloroprene tubes or beads, polyisobutylene extrusions, oilless dry jute, or rope yarn.
- 2.7 Bond preventive material shall be pressure sensitive polyethylene tape, aluminum foil complying with Fed. Spec. QQ-A-1876 or wax paper complying with Fed. Spec. A-A-883.
- 3.0 EXECUTION:
- 3.1 Preparation:
  - 3.1.1 General: Clean masonry surfaces free from efflorescence, mildew, fungus, graffiti, vines, tentacles, and all other blemishes. Wire brushing or sandblasting will not be allowed for paint removal.
  - 3.1.2 Deteriorated Material: For repointing, tuck pointing, masking, and grouting, cut out old mortar in brickwork to a minimum depth of 1/2 inch and cut out old mortar in stonework to a minimum depth of 1 inch. Deteriorated material shall be removed to the full depth of mortar disintegration. Following cleaning, blow joints clean to remove all dust, dirt, and remaining loose aggregate.
- 3.2 Masonry Cleaning:
  - 3.2.1 Washing: A specialized aeration type nozzle shall be used to project water at 1,000 or 1,200 psi pressure. Any evidence of masonry material damage or removal shall be cause for immediate work stoppage.
  - 3.2.2 Steam Cleaning: Scrub all surfaces to be cleaned with a mild soap or detergent. Apply steam at a pressure of 10 to 30 psi to thoroughly flush and remove all foreign matter and to neutralize and rinse away all cleaning solutions.
  - 3.2.3 Chemical Cleaning:
    - 3.2.3.1 Acidic products shall be used only on acid-tolerant materials such as granite, sandstone, and unglazed brick.
    - 3.2.3.2 Alkaline cleaners shall be used only on acid-sensitive materials such as limestone and marble.
    - 3.2.3.3 Surfactants shall be used only on polished granite or glazed brick.
  - 3.2.4 Abrasive Blasting:
    - 3.2.4.1 Wet aggregate blasting shall be performed using a specialized nozzle that combines specified aggregate, clean water and air. Water pressure shall not exceed 150 psi. Air pressure shall not exceed 70 psi. After cleaning, rinse surfaces to remove aggregate and loosened soil.
    - 3.2.4.2 Dry aggregate blasting shall be continuous bombardment of the masonry surface with a finely divided aggregate. Air pressure shall be between 20 and 100 psi. After cleaning, rinse surfaces to remove aggregate and loosened soil.

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3.2.5 Repointing and Tuckpointing:

3.2.5.1 Pointing of Brickwork: Compact new mortar in deep cuts in successive layers until a uniform joint depth throughout has been attained. After deep joints have been leveled, fill all joints with mortar and pack the back corners of the joint.

3.2.5.2 Pointing of stonework: compact new mortar in deep cuts in successive layers until a uniform joint depth throughout has been attained. After deep joints have been leveled, fill joints with a layer of mortar 1/2 inch deep and pack the back corners of the joint. Approximately 1 hour later, apply another layer of mortar completely filling the joint.

3.2.5.3 Tooling: Tool the joint to match the appearance of the adjacent mortar joints with a round jointer to produce smooth, dense, concave joints.

3.2.6 Masking and Grouting:

3.2.6.1 Masking: Mask the face of each individual masonry unit, keeping the edge of the tape 1/16 inch away from all edges of the masonry unit to allow an overlap of the grouting material onto the masonry.

3.2.6.2 Grouting: Completely fill all joints, cracks, and voids with grout.

3.2.6.3 Cleaning: Keep all exposed masonry clean and free of mortar as work progresses. Clean masonry surfaces using fiber brushes and trisodium phosphate solution. Rinse surfaces with clean water immediately after cleaning.

**DIVISION 5-METALS**

**Structural Steel**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of structural steel. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work. The contractor shall be responsible for all temporary shoring and/or bracing needed to support the construction. The structure may not be stable until all elements are in place.

2.0 PRODUCTS:

2.1 Structural Steel:

2.1.1 Carbon Grade Steel: ASTM A 36.

2.1.2 High-Strength Low-Alloy Steel: ASTM A 572.

2.1.3 Corrosion-Resistant High-Strength Low-Alloy Steel: ASTM A 242 or A 588.

2.1.4 Quenched and Tempered Alloy Steel: ASTM A 514.

2.1.5 Structural Tubing: ASTM A 500, Grade B or ASTM A 501.

2.1.6 Steel Pipe: ASTM A 53, Type E or Type S, Grade B.

2.2 Connections:

2.2.1 High-Strength Bolts: ASTM A 325 or A 490 including nuts and washers.

2.2.2 Carbon Steel Bolts: ASTM A 307, Grade A.

2.2.3 Carbon Steel Nuts: ASTM A 563, Grade A, Square or Hex Style.

2.2.4 Plain Washers, Other Than Those in Contact with High-Strength Bolts: ANSI B18.22.1, Type B.

2.3 Finish: Galvanized, ASTM A 123 and ASTM A 153 or ASTM A 386 or shop primer Fed. Spec. TT-P-86, Type I or II, or TT-P-645.

2.4 Fabrication: Fabrication shall be in accordance with the applicable provisions of the AISC Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings. Fabrication and assembly shall be done in the shop to the greatest extent possible. Ends shall be square within the tolerances for milled ends specified in ASTM A 6. Ungalvanized structural steelwork, except surfaces to be field welded or friction bolted, shall be prepared for painting in accordance with the AISC Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings and primed with the specified paint. All welding shall be in accordance with AWS D1.1 and shall be performed by certified welders for the type of welds and positions indicated.

3.0 EXECUTION: Erection of structural steel shall be in accordance with the applicable provisions of the AISC Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings.

3.1 Connections: Anchor bolts and other connections between the structural steel and foundations shall

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- be provided and shall be properly located and built into connecting work.
- 3.2 Base Plates and Bearing Plates: Column base plates for columns and bearing plates for beams, girders, and similar members shall be provided. Base plates and bearing plates shall be provided with full bearing after the supported members have been plumbed and properly positioned, but prior to placing superimposed loads. Separate setting plates under column base plates will not be permitted. The area under the plate shall be dry-packed solidly with bedding mortar.
  - 3.3 Galvanized Field Connections: Galvanized steel shapes shall be bolted connections only using galvanized bolts, nuts, and washers. No field welding of galvanized steel will be permitted.
  - 3.4 Welded Connections: Field welded structural connections shall be completed before load is applied. Quality of welds shall be as described in AWS D1.1. Welds determined to be defective shall be repaired at no additional expense to the member. All welds shall receive a visual examination. In addition to visual examination, fracture critical members shall receive other non destructive tests such as ultrasonic, radiographic and magnetic particle. Specific welds to receive this testing shall be as indicated on the drawings.
  - 3.5 Field Priming: After erection of ungalvanized structural steel, the field bolt heads and nuts, field welds, and any abrasions in the shop coat shall be cleaned and primed with paint of the same quality as that used for the shop coat.

**Steel Bridge Components**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of steel bridge components. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Structural Carbon Steel: ASTM A 36.
  - 2.2 High Strength Steel:
    - 2.2.1 High-Strength Low-Alloy Columbium-Vanadium Steel: ASTM A 572.
    - 2.2.2 High-Strength Low-Alloy Structural Steel with 50,000 psi Minimum Yield: ASTM A 588.
    - 2.2.3 High-Yield Strength Quenched and Tempered Alloy Steel Plate: ASTM A 514.
    - 2.2.4 Structural Steel for Bridges: ASTM A 709.
    - 2.2.5 High Strength Low-Alloy Structural Steel: ASTM A 242.
  - 2.3 Turned and Ribbed Bolts: High carbon steel turned and ribbed bolts shall comply with ASTM A 307.
  - 2.4 High Strength Steel Bolts, Nuts, and Washers: ASTM A 325.
  - 2.5 Electrodes for manual or arc welding shall comply with AWS A5.1 or AWS A5.5.
  - 2.6 Steel Forging: ASTM A 668 and of the class specified.
  - 2.7 Steel Castings: AASHTO M192 and of the class specified.
  - 2.8 Gray Iron Castings: AASHTO M105 and of the class specified.
  - 2.9 Malleable Castings: ASTM A 47, Grade 32510 or 35018.
  - 2.10 Rolled Copper-Alloy Plates: ASTM B 100, Alloy 510.
  - 2.11 Lead Plates: Comply with the requirements for common desilverized lead of ASTM B 29.
  - 2.12 Stud Shear Connectors: ASTM A 108, Grade 1015, 1017, or 1020, either semi- or fully killed.
  - 2.13 Rollers and Pins: ASTM A 36.
  - 2.14 Anchor Bolts:
    - 2.14.1 Cast-In-Place: ASTM A 307.
    - 2.14.2 Power Driven: Stainless steel with minimum penetration in concrete of 6 times bolt diameter.
  - 2.15 Rails: Section 4.2, Specifications for Steel Rails of AREA-01.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 When traffic is maintained on bridge under repair or is directed over a temporary run-around, furnish, erect, and maintain all barricades, flags, torches, lights, guardrails, temporary pavement markings, and traffic control signs required for the protection of the public and for the direction of traffic. Number, type, color, size, and placement of all traffic control devices and the use of a flagman shall comply with USDOT FHA MUTCD "Traffic Controls for Highway Construction and

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Maintenance Operations." All traffic control devices in advance of the construction limits shall also be the responsibility of the Contractor.

- 3.1.2 Structural metal work shall comply with the following:
  - a. AISC Code of Standard Practice.
  - b. AWS Structural Welding Code as modified by the AASHTO Standard Specifications for Welding of Structural Steel Highway Bridges.
  - c. AREA-01.
  - d. AASHTO Standard Specifications for Highway Bridges.
- 3.1.3 Fabrication: Form shapes with sharp lines and angles and finish with smooth surfaces. Drill or ream bolt holes 1/16 inch larger than the diameter of the bolt. Provide welded shop connections wherever possible.
- 3.2 Maintenance and Repair Methods:
  - 3.2.1 Erection: bearing surfaces and surfaces to be in permanent contact shall be clean and free from dirt and scale. Ream holes that must be enlarged to admit bolts.
  - 3.2.2 Correction of Loose Connections: Remove loose rivets by cutting rivet heads off and removing the shank or by drilling. Torches shall not be used. Remove loose bolts in bolted connections. Bolts shall not be retightened. Thoroughly remove rust and scale around bolt and rivet holes by sandblasting or wire brushing. Install a new high strength bolt of the same size as the removed bolt or rivet, unless the hole has become enlarged and a larger bolt can be used. Tighten bolts by the turn-of-nut method.
  - 3.2.3 Repair of Corroded Material: Remove all rust and corrosion by and blasting or wire brushing. Strengthen corroded members by the addition of structural carbon steel or high strength steel.

**Steel Trusses**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of steel trusses. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Steel Trusses:
    - 2.1.1 Structural Carbon Steel: ASTM A 36, unless otherwise indicated.
    - 2.1.2 High-Strength Low-Alloy Structural Steel: ASTM A 242, Grade 42.
  - 2.2 Steel Forgings: Forgings that are to be welded shall comply with Supplementary Provision S4 of ASTM A 668.
  - 2.3 Fasteners:
    - 2.3.1 High Strength Bolts, Nuts and Plain Hardened Washers: ASTM A 325.
    - 2.3.2 Anchor Bolts: ASTM A 307.
  - 2.4 Filler Metal for Welding: Electrodes for manual arc welding shall comply with AWS A5.1 or AWS A5.5.
  - 2.5 Field Repair of Shop Primer: Fed. Spec. TT-P-86.
- 3.0 EXECUTION:
  - 3.1 Structural Metals:
    - 3.1.1 Comply with AISC "Specifications for Design, Fabrication and Erection of Structural Steel for Buildings" and "Code of Standard Practice," both as modified herein.
    - 3.1.2 Piping and electrical wiring conflicting with erection of members shall be removed and placed in a new position approved by the Authorized Member Representative. Provide temporary utilities and coordination to prevent outages during this period.
    - 3.1.3 Shop and field connections shall be high strength steel bolted unless otherwise indicated.
    - 3.1.4 All metal parts shall be shop-fabricated. Assemblies shall be fitted together in the shop and delivered complete and ready for installation. Welds shall be made by operators who have been previously qualified in compliance with AWS standards to perform the type of work required. Welds exposed to view shall be dressed smooth.
    - 3.1.5 Before members are assembled or installed, bearing surfaces to be in permanent contact shall be

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clean and free from dirt, scale, and corrosion. Immediately after cleaning add a prime coat of red lead paint. Drifting to enlarge holes will not be permitted. Holes that must be enlarged to admit bolts shall be reamed. Poor matching of holes caused by either shop errors or erection errors shall be cause for rejection by the Authorized Member Representative. Steel erected under this contract shall be cleaned of any dirt, mud, or grease and left in a condition to receive coatings.

- 3.2 Strengthening of Deteriorated Members: Remove corrosion by wire brushing, sanding, or other approved method. Strengthen as directed.
- 3.3 Correction of Loose Connections: Remove loose rivets by cutting rivet heads off and removing the shank. If necessary, remove the rivet shank by drilling. Remove loose bolts in bolted connections. Bolts shall not be retightened. Install a new high strength bolt of the same size as the removed bolt or rivet, and tighten by the turn-of-the-nut method.
- 3.4 Repair of Bearings and Anchor Bolts: Remove corrosion by wire brushing, sanding, or other approved method. Additional repair requirements shall be as directed.
- 3.5 Repair of Tie Rods and Bracing: Tighten loose tie rods to the snug tight condition. Remove corrosion by wire brushing, sanding, or other approved method. Strengthen as directed.

**Steel Joists**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of steel joists. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Open Web Steel Joists: Steel joists shall conform to Steel Joist Institute SJI-01, K-Series. Joists shall be designed to support the loads given in the standard load table of SJI-01.
  - 2.2 Longspan Steel Joists and Deep Longspan Steel Joists: Steel joists shall conform to SJI-01, LH-Series or DLH-Series. Joists shall be designed to support the loads given in the standard load tables of SJI-01.
  - 2.3 Accessories and Fittings: Accessories and fittings, including end supports and bridging, shall be in accordance with the standard specifications under which the members were designed.
  - 2.4 Shop Painting: Joists and accessories shall be shop-painted with a rust-inhibiting primer paint.
- 3.0 EXECUTION: Joists shall be accurately set, and end anchorage shall be compatible with the bearing surface and the expansion requirements. Joist bridging and anchoring shall be secured in place prior to the application of any construction loads. Any temporary loads shall be distributed so that the carrying capacity of any joist is not exceeded. Loads shall not be applied to bridging. Abraded, corroded, and field-welded areas shall be cleaned and touched up with the same type of paint used in the shop painting.

**Steel Decks**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of steel roof and floor deck. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Deck Units: Deck material shall be ASTM A 611, Grade C for painted deck and ASTM A 446, Grade A for galvanized deck. Deck units shall conform to the SDI Design Manual for Composite decks, form decks, roof decks, and cellular metal floor deck with Electrical Distribution. units shall be fabricated of 22-gauge or thicker steel and shall be galvanized with ASTM A 525, G90 coating class or painted with one coat of manufacturer's standard paint.
  - 2.2 Accessories: Metal accessories shall be of the same material as the deck and have minimum gauge as follows: saddles, 18-gauge; welding washers, 10-gauge; cant strip, 22-gauge; other metal accessories, 20-gauge; unless otherwise indicated.
  - 2.3 Closure Plates: Voids above interior walls shall be closed with 22-gauge sheet metal where directed. Open deck cells at parapets, end walls, eaves, and openings through floors and roofs shall

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- be closed with 22-gauge sheet metal.
- 2.4 Miscellaneous steel shapes: ASTM A 36.
- 3.0 EXECUTION:
- 3.1 Erection of deck and accessories shall be in accordance with the SDI Design Manual for Composite decks, form decks, roof decks, and cellular metal floor deck with Electrical Distribution. The deck units shall be placed on secure supports, properly adjusted, and aligned at right angles to supports before being permanently secured in place. The maximum uniform distributed storage load shall not exceed the design live load.
- 3.2 Attachment: The deck units shall be welded or fastened with screws, powder-actuated fasteners, or pneumatically driven fasteners to supports in accordance with requirements of the SDI Design Manual for composite decks, form decks, roof decks, and cellular metal floor deck with Electrical Distribution.
- 3.3 Repair of Coatings: Welds and deck finish damage shall be touched up with an approved galvanizing repair paint for galvanized surfaces or the same type used for shop primer for painted surface.
- 3.4 Openings through deck: holes and openings required shall be drilled or cut, reinforced, and framed for rigidity and sufficient load-carrying capacity. Holes less than 6 inches across require no reinforcement. Openings 6 to 12 inches across shall be reinforced by 22-gauge steel sheet at least 12 inches wider and longer than the opening and be fastened to the steel deck a maximum of 12 inches on center. Openings larger than 12 inches shall be reinforced by steel angles on opposite sides of the opening and at a right angle to the deck ribs. Both sides of the angles shall be fastened to each rib. Angles shall extend at least two ribs beyond each side of the opening.

**Anchor Bolts and Expansion Anchors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of anchor bolts and expansion anchors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Anchor Bolts and Nuts: ASTM A 307; Hot-dipped galvanized, ASTM A 153.
- 2.2 Flat Washers: ANSI B18.2.1, of the same material as bolt.
- 2.3 Expansion Anchors:
- 2.3.1 Lead Shield Type: Fed. Spec. FF-S-325, Group I, Type 1, Class 1.
- 2.3.2 Wedge Type: Fed. Spec. FF-S-325, Group II, Type 4, Class 1 or 2.
- 2.3.3 Self-Drilling Type: Fed. Spec. FF-S-325, Group III, Type 1.
- 2.4 Fabrication:
- 2.4.1 Anchor bolts shall be "J" type for use in concrete or hooked type for use in masonry. All bolts shall be hot-dipped galvanized and furnished complete with nut and washer.
- 2.4.2 Expansion anchors shall be of standard manufacture and unless otherwise specified shall be galvanized or cadmium-plated in accordance with Fed. Spec. FF-S-92.
- 3.0 EXECUTION:
- 3.1 Anchor bolts shall either be cast in new concrete or regouted in place with non-shrinking grout.
- 3.2 Expansion anchors shall be of the type best suited for the work. Embedment shall be as directed but in no case less than six times the bolt diameter. Minimum distance between the anchor center line and the edge of concrete shall not be less than 4-1/2 times the diameter of the hole in which anchor is installed.

**Metal Stairs**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of metal stairs. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:

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- 2.1 Steel Plates, Shapes, and Bars: ASTM A 36.
- 2.2 Steel Bar Grating: ASTM A 569.
- 2.3 Gray Iron Castings: ASTM A 48, Class 30.
- 2.4 Malleable Iron Casting: ASTM A 47.
- 2.5 Cast Aluminum: ASTM B 26 or B 108.
- 2.6 Metal Pan Treads: Pressed or structural steel pans, ASTM A 446, Grade B, shop coated, with a minimum depth of 2 inches for concrete fill. 2.7 Cast Metal Treads shall have an integral non-skid surface.
- 2.8 Grating and metal pan treads shall have cast metal non-skid nosings. 2.9 Finish: Steel plates, shapes, bars, and grating shall be galvanized in accordance with ASTM A 386 or primed with fabricator's standard shop primer as directed.
- 2.10 Fabrication: stair units shall be shop welded or bolted. Units shall be shop-assembled to ensure fit. Stairs are to be shipped in the largest units practical to reduce field erection time. All fabrication shall conform to AISC Manual and ASTM A 6.
- 3.0 EXECUTION:
- 3.1 Erection: Erect stairs level and plumb. Treads shall be level both front to back and across the width. Stair units shall be securely fastened to floors and landings. Field erection shall be in accordance with AISC Manual except that connections shall be bolted only.
- 3.2 Repair of Coatings: Connections and abrasions in the shop coating shall be touched up with an approved galvanizing repair paint or primer to match shop primer.

**Pipe and Tube Railings**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of handrailings and ladders. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Post and Rails: Steel pipe, ASTM A 53, Type E or S, Grade B, Schedule 40.
- 2.2 Bars and Rungs: ASTM A 36.
- 2.3 Finish: Galvanized, ASTM A 123 or shop primer, Fed. Spec. TT-P-86, Type I or II; TT-P-645.
- 2.4 Fabrication:
- 2.4.1 Handrailings shall be smooth, with all projecting joints and sharp corners ground smooth. Welded joints shall be flush type. Members shall be neatly coped and continuously welded at all junctions of posts and rails. Flattening of the rail or post ends at junctions of posts and rails will not be permitted. Fittings or other connectors shall not be used at junctions of posts and rails.
- 2.4.2 Ladders: Rails shall be angle or flat bars. Rungs shall be round or square bars and shall project through rails. Welds shall be continuous.
- 2.4.3 Cages shall be provided as directed and shall be fabricated from flat bars. Vertical bars shall be inside supporting hoops. Bars shall be welded at each intersection.
- 3.0 EXECUTION: Hand rails and ladders shall be erected in accordance with the AISC Manual. Hand rails shall be rigidly attached to structure to provide unyielding obstruction. Ladders shall be bolted to structure unless otherwise directed.

**Grating**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of grating. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Aluminum Grating, Banding, and Kick Plate: Rectangular, pressure-locked bearing bars, ASTM B 221, 6063-T6, mill finish.
- 2.2 Steel Grating:
- 2.2.1 Grating: Rectangular, welded, ASTM A 569.

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- 2.2.2 Bands and Kick Plate: ASTM A 36.
- 2.2.3 Finish: Galvanized, ASTM A 123 or painted with fabricator's standard shop primer.
- 2.3 Fabrication: rectangular floor grating shall be in accordance with the Metal Bar Grating Manual published by the National Association of Architectural Metal Manufacturers (NAAMM). Where openings are directed in the grating, sections shall be laid out so that section edges will be centered on the openings. All openings shall be provided with kick plate or banding or required. All raw edges of grating shall be banded unless directed otherwise.
- 3.0 EXECUTION:
  - 3.1 Erection: grating shall be anchored in place with welded stud bolts and saddle clips or other acceptable fasteners.
  - 3.2 Touchup shall be either with an approved galvanizing repair paint or a primer to match shop primer.

**Castings**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of castings. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedure shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Frames, Covers, and Steps:
    - 2.1.1 Gray Iron: ASTM A 48, Class 30.
    - 2.1.2 Steel: ASTM A 36; Galvanized, ASTM A 123.
    - 2.1.3 Aluminum: ASTM B 26, 356-T6.
  - 2.2 Corner Protection: Steel angles with anchors, ASTM A 36; Galvanized, ASTM A 123.
  - 2.3 Ventilation Boxes: Extruded Aluminum, ASTM B 221, 2063-T6.
  - 2.4 Bituminous Paint: SSPC-Paint 12 (cold-applied asphalt mastic).
- 3.0 EXECUTION:
  - 3.1 Frames, steps, corner protection, or other castings to be embedded in concrete shall be accurately positioned and securely anchored to forms prior to placement of concrete.
  - 3.2 Castings to be located in masonry or other building material shall be temporarily braced and held firm to ensure accurate placement in final construction.
  - 3.3 Aluminum surfaces that will be in contact with grout, concrete, masonry, wood, or dissimilar metals shall be coated with a heavy coat of bituminous paint.

**Miscellaneous Metal Bridge Components**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of miscellaneous metal bridge components. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Structural Carbon Steel: ASTM A 36.
  - 2.2 High Strength Steel Bolts, Nuts, and Washers: ASTM A 325.
  - 2.3 Electrodes: Electrodes for manual or arc welding shall comply with AWS A5.1 or AWS A5.5.
  - 2.4 Anchor Bolts:
    - 2.4.1 Cast-In-Place: ASTM A 307.
    - 2.4.2 Power Driven: Stainless steel. When set in concrete or masonry, the minimum penetration shall be 6 times the diameter of the shank.
  - 2.5 Grid Flooring: ASTM A 36, galvanized, skid-resistant, unless otherwise directed.
  - 2.6 Aluminum for Railings:
    - 2.6.1 Aluminum Alloy Extruded Rail: ASTM B 221, Alloy 6061-T6 or 6351-T5.
    - 2.6.2 Cast Aluminum Railing Posts: AASHTO M193, Alloy A444-T4.
  - 2.7 Stainless Steel Hardware for Railings:
    - 2.7.1 Stainless Steel Machine Bolts and Cap Screws: ASTM A 193, Grade B8 or B8M, Class 2A threads,

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- except the minimum tensile strength shall be 100,000 psi.
- 2.7.2 Stainless Steel Threaded Bars: ASTM A 276, Type No. 302, Condition B, Class 2B threads.
  - 2.7.3 Stainless Steel Flat Washers and Lock Washers: ASTM A 240, Type 302.
  - 2.7.4 Carbon and Alloy Steel Nuts: ASTM A 194, Grades 6 and 6F.
  - 2.8 Steel Pipe for Railings and Posts: ASTM A 53, Grade B, or ASTM A 120, black or galvanized.
  - 2.9 Steel Plate Beam Guardrail:
    - 2.9.1 Guardrail: AASHTO M180, Class A, Type 1.
    - 2.9.2 Bolts, Nuts, and Washers: ASTM A 307, galvanized in compliance with ASTM A 153.
    - 2.9.3 Post Connectors: ASTM A 36, galvanized in compliance with ASTM A 123.
  - 2.10 Cables and Accessories for Cable Guardrail: AASHTO M30, Class A, Type I.
  - 2.11 Metal Posts: ASTM A 36 galvanized in compliance with ASTM A 123.
  - 2.12 Wood Posts: Comply with the specifications for treated wood posts contained in the state's standard specifications.
  - 2.13 Steel Traffic Treads: Not less than 3/16 inch thick, exclusive of the raised portions, not less than 24 inches wide, and the individual sections not more than 15 feet long. Treads shall have a non-skid surface with alternate projections at right angles to each other. The raised portions shall be formed in the rolling and not by punching or pressing from the underside. Treads shall be punched 7/16 inch for lag screws or bolts. The holes shall be placed not less than 1-1/4 inches nor more than 1-1/2 inches from the edge of the tread. The spacing of holes on both sides of the tread shall not be more than 15 inches and on both ends of each section not more than 6 inches. The weight of the treads shall be approximately 8-3/4 pounds per square foot.
- 3.0 EXECUTION:
- 3.1 Preparation:
    - 3.1.1 Traffic Control: When traffic is maintained on bridge under repair or is directed over a temporary run-around, furnish, erect, and maintain all barricades, flags, torches, lights, guardrails, temporary pavement markings, and traffic control signs required for the protection of the public and for the direction of traffic. Number, type, color, size, and placement of all traffic control devices and the use of a flagman shall comply with USDOT FHA MUTCD "Traffic Controls for Highway Construction and Maintenance Operations." All traffic control devices in advance of the construction limits shall also be the responsibility of the Contractor.
    - 3.1.2 Structural metal work shall comply with the following:
      - a. AISC Code of Standard Practice.
      - b. AWS Structural Welding Code as modified by the ANSI/AASHTO/AWS D1.5.
      - c. AREA-01, Chapter 15 .
      - d. AASHTO Standard Specifications for Highway Bridges.
    - 3.1.3 Fabrication: Form shapes with sharp lines and angles and finish with smooth surfaces. Drill or ream bolt holes 1/16 inch larger than the diameter of the bolt. Provide welded shop connections wherever possible. Fabricate rail elements parallel to grade line. Posts shall be normal to parapet.
      - 3.1.3.1 Steel Railing: Rails and posts shall be jointed by either mechanically fastened flush fittings or welding. Grind welds smooth and flush. Lay flex beam railing in the direction of traffic.
      - 3.1.3.2 Aluminum Railing: Join railings and posts by either slip type fittings, mechanically fastened fittings, or inner-wedge system. Fastenings shall be stainless steel, set flush or recessed.
  - 3.2 Erection:
    - 3.2.1 Connections: Bearing surfaces and surfaces to be in permanent contact shall be clean and free from dirt and scale. Ream holes that must be enlarged to admit bolts. Field correction of fabrication errors shall be made only with approval of the Authorized Member Representative.
    - 3.2.2 Coat aluminum surfaces that will be in contact with dissimilar materials as follows:
      - a. Contact with Steel: One coat of zinc chromate primer, Fed. Spec. TT-P-645 or one coat of a suitable nonhardening joint compound, Fed. Spec. TT-S-
      - b. Contact with Wood, Fiberboard, Masonry, or other Porous Material: Alkali-resistant bituminous paint, ASTM D 2939.
      - c. Aluminum Embedded in Concrete: One coat of zinc chromate primer, Fed. Spec. TT-P-645, alkali-resistant bituminous paint, ASTM D 2939, or wrapped with a suitable plastic tape.
  - 3.3 Maintenance and Repair Methods:

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- 3.3.1 Open Grid Bridge Floor: Realign grids that are not in proper alignment. Replace broken clips connecting grids to grid support system. Reweld cracked or broken welds between grid and grid support system. Remove and replace deficient rectangular grid decking as directed.
- 3.3.2 Concrete Filled Grating: Repair or remove and replace grating as directed. Replace concrete with 4,000 psi concrete with 4 to 6 percent entrained air.
- 3.3.3 Railing:
  - 3.3.3.1 Remove damaged and deteriorated railing and install new railing as directed.
  - 3.3.3.2 Anchor Bolts and Connections: Tighten all loose nuts. Replace all corroded anchor bolts with drilled anchor bolts to concrete, ASTM A 307 bolts to steel for steel railing, and stainless steel bolts for aluminum railing.
- 3.3.4 Repair of Corroded Material: Remove all rust and corrosion by sandblasting or wire brushing. Strengthen corroded members by the addition of structural carbon steel or high strength steel.

**Ornamental Handrail and Railings**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of ornamental handrail and railings. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Tubing, Bars, and Shapes:
    - 2.1.1 Aluminum: ASTM B 221, 6063-T6, T-52.
    - 2.1.2 Steel: ASTM A 36, A 500, A 501.
    - 2.1.3 Bronze: ASTM B 135, Alloy C23000.
    - 2.1.4 Stainless Steel: ASTM A 554, Grade MT304; ASTM A 312, Grade TP304; ASTM A 167, Type 304.
    - 2.1.5 Brass: ASTM B 135, Alloy C28000 and ASTM B 455, Alloy C38500.
  - 2.2 Castings:
    - 2.2.1 Aluminum: ASTM B 26, 356-T6.
    - 2.2.2 Steel: Gray Iron, ASTM A 48, Class 30; Malleable Iron, ASTM A 47.
    - 2.2.3 Bronze: ASTM B 584, Alloy C92300.
    - 2.2.4 Stainless Steel: ASTM A 743, Grade CF8 or CF20.
    - 2.2.5 Brass: ASTM B 584, Alloy C85700.
  - 2.3 Wood handrails shall be hardwood handrail of species and profile selected from manufacturer's standards, bonded to metal subrail, with manufacturer's standard transparent finish, unless otherwise directed.
  - 2.4 Fasteners: Furnish fasteners of basic metal and alloy, matching finished color and texture as the metal being fastened, unless otherwise directed. Unless otherwise directed provide Phillips flat-head screws for exposed fasteners.
  - 2.5 Bituminous Paint: SSPC-Paint 12 (cold-applied asphalt mastic).
  - 2.6 Fabrication: Stainless steel and steel handrails shall have welded connections. Aluminum handrails shall be either welded or non-welded. Bronze and brass handrail shall have non-welded connections.
    - 2.6.1 Welded Connections: Fabricate handrails and railings of materials indicated for interconnections of members by welding. Preassemble railing units, to maximum extent practicable, consistently with shipping and handling limitations. Welding shall comply with applicable AWS specifications, using method appropriate for metal and finish indicated. Grind exposed welds smooth and flush to match and blend with adjoining surfaces.
    - 2.6.2 Nonwelded Connections: Fabricate railings and handrails for interconnection of members by means of railing manufacturer's standard concealed mechanical fasteners and fittings unless otherwise directed. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
    - 2.6.3 Protective Lacquer: Metal handrails shall be shop-coated with clear non-yellowing lacquer, of type recommended for protection of the finished metal surface.
- 3.0 EXECUTION:
  - 3.1 Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

Attachment 1: Specifications for the Work

- 3.2 Expansion Joints: Provide expansion joints at locations directed or at intervals not to exceed 40 feet. Provide internal sleeve type slip-joint extending 2 inches beyond joint on either side; fasten internal sleeve securely to one side, locate joint within 6 inches of post.
- 3.3 Provide Anchorage Devices and Fasteners where necessary for securing ornamental metal items to in-place construction, including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.
- 3.4 Form Tight Joints with exposed connections accurately fitted with uniform reveals and spaces for sealants and joint fillers. Where cutting, welding, and grinding are required for proper shop fitting and jointing of the work, restore finishes to eliminate any evidence of such corrective work.

**Ornamental Sheet Metal**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of ornamental sheet metals. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Materials:
    - 2.1.1 Steel Sheet: ASTM A 527, galvanized.
    - 2.1.2 Aluminum Sheet: ASTM B 209, Alloy 5052-H32.
    - 2.1.3 Extruded Aluminum: ASTM B 221, Alloy 6063-T6, T-52.
    - 2.1.4 Bronze: ASTM B 455, Alloy C38500 and ASTM B 135, Alloy C8000.
    - 2.1.5 Stainless Steel: ASTM A 554, Grade MT304; ASTM A 312, Grade TP304; ASTM A 167, Type 304.
  - 2.2 Wall Louvers: Weather-resistant type, with bird screens and made to withstand a wind load of not less than 30 lb/sf. Wall louvers shall bear the AMCA certified rating program seal for air performance and water penetration in accordance with AMCA-500 and AMCA-511. The rating shall show a water penetration of 0.20 or less at 800 fpm.
    - 2.2.1 Extruded Aluminum Louvers: Fabricated of extruded 6063-T6 or 6063-T52 aluminum with a wall thickness of not less than 0.080 inch thick.
    - 2.2.2 Formed Metal Louvers: Formed of zinc-coated steel sheet not thinner than 16 U.S. gauge, or aluminum sheet not less than 0.08 inch thick.
    - 2.2.3 Mullions: Same material and finish as louvers.
    - 2.2.4 Screens and Frames: Minimum 1/4-inch square mesh and minimum 16-gauge aluminum bird screen. Mount screens in removable, rewirable frames of same material and finish as the louvers.
  - 2.3 Door Louvers: Inverted "Y" or "V" sightproof type not less than 1-3/8 inch thick with matching metal trim. Louvers for exterior doors shall be weather-resistant type.
    - 2.3.1 Extruded Aluminum Door Louvers: Minimum 0.050 inch thick 6063-T6 or 6063-T52 aluminum alloy. Frame and trim shall be clamp-in "L" type.
    - 2.3.2 Formed Metal Door Louvers: Minimum 20 U.S. gauge steel sheet or minimum 0.050 inch thick sheet aluminum. Trim shall be beveled "Z" molding both sides.
    - 2.3.3 Screens and Frames: Screen shall be aluminum, RR-W-365, Type VII. Mount screens in removable, rewirable frames of same material and finish as the louvers.
  - 2.4 Fasteners: Stainless steel screws and fasteners as required.
  - 2.5 Finishes:
    - 2.5.1 Aluminum: Factory-applied anodic coating or organic coating.
      - 2.5.1.1 Anodic Coating: AA-M10-C22-A31, Architectural Class II, clear finish or AA-M10-C22-A32, Architectural Class II, integral color finish.
      - 2.5.1.2 Organic Coating: AAMA 605.2, 0.8 mil minimum dry film thickness, baked enamel finish.
    - 2.5.2 Steel: Factory-applied coating, rust-inhibitive primer and baked enamel finish coat, 1 mil minimum total dry film thickness.
  - 2.6 Motorized Louvers: Electric motor shall be completely encased in the louver sill. Motor shall be U.L. approved, 120 volt, 60 hertz with a transformer.
- 3.0 EXECUTION:
  - 3.1 Copper or Copper-Bearing Alloys: Paint copper or copper-bearing alloys in contact with dissimilar

Attachment 1: Specifications for the Work

- metal with heavy-bodied bituminous paint or separate with inert membrane.
- 3.2 Aluminum: Where aluminum contacts metal other than zinc, paint the dissimilar steel with a primer and two coats of aluminum paint.
- 3.3 Metal: Paint metal in contact with mortar, concrete, or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint.
- 3.4 Wood: Paint wood or other absorptive materials that may become repeatedly wet and in contact with metal with two coats of aluminum paint or a coat of heavy-bodied bituminous paint.

**Expansion Control**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of building expansion joint covers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Frames and Covers:
    - 2.1.1 Aluminum: ASTM B 221, 6063-T6.
    - 2.1.2 Bronze: ASTM B 455, Alloy C 38500.
    - 2.1.3 Stainless Steel: ASTM A 167, Type 304.
  - 2.2 Resilient Filler: Neoprene, elastomeric, or extruded vinyl.
  - 2.3 Bituminous Paints: SSPC-Paint 12 (cold-applied asphalt mastic).
  - 2.4 Fabrication: Shop assemble components and package with anchors and fittings. Provide joint components in single lengths whenever practical.
- 3.0 EXECUTION:
  - 3.1 Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.
  - 3.2 Installation: Rigidly anchor expansion assembly to both sides of expansion joints to prevent misalignment.

**Bridge Expansion Devices, Bearings and Anchors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of bridge expansion devices, bearings, and anchors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Joint Filler:
    - 2.1.1 Preformed Bituminous: AASHTO M33.
    - 2.1.2 Preformed Fiber and Preformed Bituminous Inorganic Fiber: AASHTO M213.
    - 2.1.3 Preformed Cork: AASHTO M153, Type II.
    - 2.1.4 Preformed Self-Expanding Cork: AASHTO M153, Type III.
    - 2.1.5 Preformed Sponge Rubber: AASHTO M153, Type I.
    - 2.1.6 Preformed Closed Cell Plastic: Low density, extruded, closed cell expanded polyethylene plastic foam that is chemically inert.
  - 2.2 Cold-Poured Joint Sealer: CE CRD-C-527.
  - 2.3 Hot-Poured Joint Sealer: AASHTO M173.
  - 2.4 Preformed Elastomeric Compression Joint Sealer: AASHTO M220.
  - 2.5 Neoprene Expansion Joints:
    - 2.5.1 Elastomer shall have the following physical properties:
      - a. Tensile Strength (ASTM D 412): 1,800 psi minimum.
      - b. Elongation at Break (ASTM D 412): 400 percent minimum.
      - c. Hardness (ASTM D 2240): 40 to 50 points Durometer A.
    - 2.5.2 Sealant: A two-component polysulfide liquid sealant complying with Fed. Spec. TT-S-00227, Type II.

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- 2.6 Fabric bearing pads shall consist of a fabric and rubber body made with unvulcanized rubber and unused fabric fibers. The rubber body shall be natural polyisoprene or polychloroprene. Average hardness shall be 80 to 90 Shore A Durometer. Ultimate breakdown limit under compressive loading shall be no less than 7,000 psi. Tolerance on thickness shall be plus or minus 1/16 inch.
- 2.7 Graphited Asbestos Bearing Pads: Asbestos fibers bonded together with synthetic rubber elastomer. One face of each pad shall be impregnated with graphite. The surface hardness shall be 95-100 Shore A Durometer. Tolerance on thickness of pads shall be plus or minus 1/16 inch. Graphited surfaces shall be in contact.
- 2.8 Bronze Bearings and Expansion Plates: AASHTO M107, Alloy B.
- 2.9 Rolled Copper-Alloy Bearings and Expansion Plates: AASHTO M108, Alloy 510.
- 2.10 Bearing and Expansion Plates: Sliding bearings shall have a surface roughness value not exceeding 125 per ANSI B46.1.
- 3.0 EXECUTION:
- 3.1 Traffic Control: When traffic is maintained on bridge under repair or is directed over a temporary run-around, furnish, erect, and maintain all barricades, flags, torches, lights, guardrails, temporary pavement markings, and traffic control signs required for the protection of the public and for the direction of traffic. Number, type, color, size, and placement of all traffic control devices and the use of a flagman shall comply with USDOT FHA MUTCD "Traffic Controls for Highway Construction and Maintenance Operation." All traffic control devices in advance of the construction limits shall also be the responsibility of the Contractor.
- 3.2 Maintenance and Repair Methods:
  - 3.2.1 Expansion Devices:
    - 3.2.1.1 Remove all dirt and debris from joints to be repaired. Adjust joint width accurately for temperature at time of setting. Cut joint filler to fit exactly and completely fill the joint.
    - 3.2.1.2 Expansion Devices, Including Elastomeric and Steel: Repair or replace as directed.
  - 3.2.2 Bearing Devices:
    - 3.2.2.1 General: Remove all debris from the bearing seats. Tighten loose connections. Loose high strength bolts shall be removed and replaced.
    - 3.2.2.2 Steel Components: Remove rust and corrosion by sandblasting or wire brushing.
    - 3.2.2.3 Bearing Devices, Including Bearing Plates, Roller Expansion Bearings, Rocker Expansion Bearings, Pins and Hanger Bearings, and Anchor Bolts: Repair or replace as directed.

**Water Treatment Plant Debris Racks**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation materials for repair and maintenance of debris racks for water treatment plant intake structures. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Manually Cleaned Racks: Repair or replacement parts for manually cleaned racks shall be galvanized or alloy steel rods, bars, or structural shapes. Galvanized material shall comply with ASTM A 153 and B 633. Alloy steel material shall comply with ASTM A 193, A 480; and A 564, as applicable.
  - 2.2 Fasteners shall comply with ASTM A 307 or A 325 for bolts and A 502 for rivets.
- 3.0 EXECUTION:
  - 3.1 Silt Removal: Cofferdams and temporary bypass inlets shall be provided to allow dewatering. Water level shall be lowered, and silt and debris shall be pumped, shoveled, or otherwise removed from around rack.
  - 3.2 Repair or replacement of structural members, rods, and shapes shall be by welding or riveting, as applicable to the existing construction. All welding shall be in compliance with AWS D1.1.

**DIVISION 6-WOOD AND PLASTICS**

**Light Wooden Structures Framing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for light wooden structures framing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Grading and Marking: Materials shall bear the grademark, stamp, or other identifying marks indicating grades of material and rules or standards under which they were produced, including requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification. The inspection agency for lumber shall be certified by the Board of Review, American Lumber Standards Committee, to grade species used. Except for structural laminated members, plywood, and lumber, bundle marking or certificates will be permitted in lieu of marking each individual piece. Species and grades are listed in Table 1 at the end of this section.
  - 2.2 Sizes: Lumber sizes shall conform to the requirements of the rules or standards under which produced, and unless otherwise specified, lumber shall be surfaced on four sides.
  - 2.3 Moisture Content: At the time lumber and other materials are delivered and when installed in the work their moisture content shall be as follows:
    - 2.3.1 Treated and Untreated Lumber 2 Inches or Less in Thickness, Except Roof Planking: 19 percent maximum.
    - 2.3.2 Treated and Untreated Lumber Over 2 Inches in Thickness, Except Roof Planking: 25 percent maximum.
    - 2.3.3 Roof Planking 2 Inches or More in Thickness: 15 percent maximum.
    - 2.3.4 Materials Other Than Lumber: In accordance with standard under which product is produced.
  - 2.4 Wood Member Design:
    - 2.4.1 Trussed Rafters: As an option to standard rafters, trussed rafters may be provided. Connections shall be made with light metal plate connectors. Light metal plate connected wood trusses shall be designed in conformance with TPI Design Specifications for Metal Plate Connected Wood Trusses and fabricated in conformance with the TPI Quality Standard for Metal Plate Connected Wood Trusses.
    - 2.4.2 Non-stress graded members shall include plates, caps, bucks, studs, framing for skirting and other miscellaneous framing, blocking, nailers, sleepers, and grounds. Members shall be standard grade or No. 2 grade except studs may be stud grade. Non-stress member grades shall conform to the National Grading Rule for Dimension Lumber established in conformance with the rules or standards under which produced and as applied in individual grading rules of applicable grading agencies.
    - 2.4.3 Structural glued laminated members shall be in accordance with AITC A 190.1. Members shall be sealed with a penetrating sealer and wrapped in accordance with AITC 111.
  - 2.5 Preservative Treatment: Lumber not over 5 inches thick and plywood, when in contact with soil, shall be treated in accordance with AWPB LP-22, LP-33, or LP-44; when specified to be painted or used in built-up roofing systems, AWPB LP-2 or LP-22; and for all other purposes, AWPB LP-2, LP-3, or LP-4. Except as otherwise specified, lumber over 5 inches thick shall be pressure preservative-treated in accordance with AWPB C2. Structural glued laminated timber shall be treated in accordance with AWPB C28. Wood treated with oil-borne preservatives shall be clean, free from surface oil, and properly seasoned for use in building construction. Wood treated with water-borne preservatives shall be marked with the word "Dry." Creosote or coal-tar solutions shall not be used. Surfaces of lumber that will be exposed shall not be incised. Exposed areas of treated wood that are cut or drilled after treatment shall receive a field treatment in accordance with AWPB M-4. Items of all-heart material of cedar, cypress, or redwood will not require preservative treatment, except when in direct contact with soil. Unless otherwise specified, all wood members exposed to weather or in contact with soil, water, masonry, or concrete, and all wood framing members

Attachment 1: Specifications for the Work

directly above soil when the bottom elevation is 18 inches or less above soil shall be pressure preservative-treated. The following items will always be treated:

- a. All wood members set into concrete regardless of location, including flush-with-deck wood nailers for roofs.
  - b. All wood members in contact with slabs-on-grade, including wood floor sleepers over waterproofed slab surface.
  - c. All wood members in contact with foundation walls.
  - d. Furring strips used on walls or partitions below grade.
  - e. Furring strips used on exterior walls above grade.
  - f. All wood members used for rough framing of openings in exterior concrete or masonry walls.
  - g. All wood members used in exterior exposed construction such as steps, platforms, walkways, railways, and framing for skirting and other miscellaneous framing.
  - h. Nailing strips used over fiberboard or gypsumboard wall sheathings as a base for wood shingles.
- 2.6 Fire-Retardant Treatment: Fire-retardant treated wood shall be pressure-treated in accordance with AWPA C20 for lumber and AWPA C27 for plywood. Treatment and performance inspection shall be by an independent and qualified testing agency that establishes performance ratings. Each piece or bundle of treated material shall bear identification of the testing agency to indicate performance in accordance with such rating. Treated materials to be exposed to rain wetting shall be subjected to an accelerated weathering technique in accordance with ASTM D 2898 prior to being tested for compliance with AWPA C20 or C27.

3.0 EXECUTION:

- 3.1 All nailing shall be in accordance with the recommended nailing schedule as contained in NFOPA Manual for Wood Frame Construction.
- 3.2 Installation of timber connectors shall conform to applicable requirements of the NFOPA National Design Specification for Wood Construction.
- 3.3 Members shall be framed for passage of ducts and pipes and shall be cut, notched, or bored in accordance with applicable requirements of the NFOPA Manual for Wood Frame Construction.
- 3.4 Framing shall be kept at least 2 inches away from chimneys and 4 inches away from fireplace backwalls.
- 3.5 Leveling of joists, beams, and girders on masonry or concrete shall be with slate or steel; on wood or metal, leveling shall be without shims.

Grading Rules	Species	No. 1	No. 2
NHLA	Red Oak	X	
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NELMA	Northern Pine		X
	Eastern Hemlock-Tamarack		X
SPIB	Southern Pine	X	
WCLB	Douglas Fir-Larch		X
	Hem-Fir		X
WWPA	Douglas Fir-Larch		X
	Hem-Fir		X
	Douglas Fir-South		X
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**Sheathing, Siding and Subflooring**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of sheathing, siding, and subflooring. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 General: Materials shall bear the grademark, stamp, or other identifying marks indicating grades of material and rules or standards under which produced. Such identifying marks on material shall be in accordance with the rule or standard under which the material is produced, including

Attachment 1: Specifications for the Work

- requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification. The inspection agency for lumber shall be certified by the Board of Review, American Lumber Standards Committee, to grade species used. Bundle marking or certificates will be permitted in lieu of marking each individual piece, except for structural laminated members, plywood, and lumber. Size and moisture content shall conform to requirements of the rules or standards under which materials are produced.
- 2.2 Plywood shall be in accordance with DOC PS 1, Grade C-D for wall sheathing and Grade C-D with exterior glue for roof sheathing, unless otherwise specified.
  - 2.3 Roof decking design stresses shall be as specified for structural members. Decking shall be tongue and groove, V-jointed, and matched and dressed where exposed. As an option, fabricated, laminated lumber decking with interlocking tongue and groove joints may be provided.
  - 2.4 Sheathing shall be of either fiberboard, gypsum board, plywood, V-structural-use panels, or wood for wall sheathing; and either plywood, structural-use panels, or wood for roof sheathing and skirting for temporary structures including access doors through skirting as required.
    - 2.4.1 Fiberboard shall be in accordance with ASTM C 208, sheathing grade, or ASTM D 2277; asphalt-impregnated or asphalt-coated to be water-resistant but vapor permeable.
    - 2.4.2 Gypsum board shall be in accordance with ASTM C 79.
    - 2.4.3 Structural-use panels shall meet the qualification requirements of APA Performance Standards and Policies for Structural-Use Panels. Panels shall conform to APA Product Guide for Performance Rated Panels for Sheathing, Exp 1 or 2, or Ext; or Structural I or II Rated Sheathing, Exp 1 or Ext.
    - 2.4.4 Wood shall be center-matched, ship-lapped, or square-edge, except exposed roof sheathing shall be V-jointed, matched and dressed. Species and grade shall be in accordance with Table 1 at the end of this section.
  - 2.5 Shear wall panels shall be of plywood or sheathing conforming to APA Product Guide for Performance Rated Panels for Sheathing, Exp 1 or 2, or Ext; or Structural I or II Rated Sheathing, Exp 1 or Ext.
  - 2.6 Subflooring shall be of either plywood, structural use panels, or wood.
    - 2.6.1 Plywood shall conform to DOC PS 1; Grade C-D for uses not otherwise specified, Grade C-D with exterior glue for reception of underlayment as wood flooring, underlayment grade with exterior glue or C-C (Plugged), and exterior grade for use as a combination subfloor-underlayment under resilient flooring.
    - 2.6.2 Structural-use panels shall be APA Rated structural-use panels qualified for subflooring or combination subfloor-underlayment under APA Performance Standards and Policies for Structural-Use Panels.
    - 2.6.3 Wood shall be center-matched, ship-lapped, or square-edge. Species and grade shall be in accordance with Table 1 at the end of this section.
    - 2.6.4 Adhesive shall conform to APA AFG-01.
  - 2.7 Underlayment shall be either hardboard, particleboard, or plywood.
    - 2.7.1 Hardboard shall be in accordance with ANSI A135.4, service class, sanded on one side, 1/4-inch thick and 4 feet wide.
    - 2.7.2 Particleboard shall be in accordance with ANSI A208.1, Grade 1-M-1, 1/4-inch thick, and 4 feet by 4 feet.
    - 2.7.3 Plywood shall be in accordance with DOC PS 1, underlayment grade with exterior glue, or C-C (Plugged) exterior grade, 3/8-inch thick and 4 feet wide.
  - 2.8 Moisture barrier of building paper shall be asphalt-saturated felt conforming to ASTM D 226, Type I or polyethylene sheeting shall conform to ASTM D 2103, 4 mil thick.
  - 3.0 EXECUTION:
    - 3.1 Nailing shall be in accordance with the Recommended Nailing Schedule as contained in NFOPA Manual for Wood Frame Construction.
    - 3.2 Sheathing Installation:
      - 3.2.1 Fiberboard sheathing shall be applied with edges 1/8 inch apart at joints, fitted snugly at abutting frames of openings, and nailed or stapled. Sheets 2 feet wide shall be applied horizontally with the tongued groove up and with vertical joints over supports and staggered. Sheets 4 feet wide shall be applied vertically, extended over top and bottom plates, and with all vertical and horizontal

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- joints over supports.
- 3.2.2 Gypsum board sheathing shall be applied with edges in light contact at joints and nailed. Sheets 2 feet wide shall be applied horizontally with tongued edge up and with vertical joints over supports and staggered. Sheets 4 feet wide shall be applied vertically, extended over top and bottom plates, and with all vertical and horizontal joints over supports.
- 3.2.3 Plywood sheathing shall be applied with edges 1/8 inch apart at side joints, 1/16 inch apart at end joints, and nailed at supported edges at 6 inches on center and at intermediate supports 12 inches on center. Nailing of edges shall be 3/8 inch from the edges. Wall sheathing shall extend over top and bottom plates. If applied horizontally, the vertical joints shall be made over supports and staggered. Wall sheathing over which wood shingles are to be applied shall be applied horizontally. Roof sheathing shall have face grain at right angles to supports with end joints made over supports and staggered.
- 3.2.4 Structural-use panels shall be applied with edges 1/4 inch apart at side joints, 1/8 inch apart at end joints, and nailed at supported edges at 6 inches on center and at intermediate supports 12 inches on center. Nailing of edges shall be 3/8 inch from the edges. Wall sheathing shall extend over top and bottom plates and, if applied horizontally, the vertical joints shall be made over supports and staggered. Wall sheathing over which wood shingles are to be applied shall be applied horizontally. Roof sheathing shall have end joints made over supports and staggered.
- 3.2.5 Wood Sheathing: End joints shall be made over framing members and so alternated that there will be at least two boards between joints on the same support. Each board shall bear on at least three supports. Boards shall be nailed at each support using two nails for boards 8 inches and less in width and three nails for boards more than 8 inches in width.
- 3.3 Subflooring Installation: A clearance of 1/4 inch shall be provided at walls. Plywood subflooring and structural-use panel subflooring may be installed with adhesive conforming to APA AFG-01 and nails spaced at 12 inches on center. Installation of subflooring with adhesives shall be in accordance with APA Design/Construction Guide: Residential and Commercial. Each plywood or structural-use panel shall have end joints made over supports and staggered. Where finish flooring of different thicknesses is used in adjoining areas, wood trips of the thickness required to bring the finish flooring surfaces to the same plane shall be used under the subfloor panels. Plywood subflooring shall be applied with the face grain at right angles to the supports, with edges 1/8 inch apart at side joints and 1/16 inch apart at end joints. Structural-use panel subflooring shall be applied over two or more supports with the long dimension across supports and with edges 1/4 inch apart at side joints and 1/8 inch apart at end joints. Wood subflooring shall bear on at least three supports.
- 3.4 Installation of Underlayment shall be applied with edges 1/32 inch apart at joints and a clearance of 1/4 inch at walls. Joints at underlayment shall not be located directly over parallel joints at subflooring. Power driven wire staples of lengths recommended by the underlayment manufacturer may be used in lieu of nails. Any surface roughness at nail heads or joints shall be lightly sanded to blend with the undisturbed surface. When plywood combination subfloor-underlayment is used in lieu of separate layers, it shall be installed as specified for plywood subfloor, except all joints shall be made over supports with edge joints spaced 1/8 inch apart and end joints spaced 1/16 inch apart. When plywood combination subfloor-underlayment is tongued and grooved, only end joints shall require support. Tongued and grooved combination subfloor-underlayment shall be applied with joints spaced 3/32 inch apart.
- 3.5 Installation of Shear Wall Plywood or Structural-Use: Panels shall be installed with the long dimension parallel or perpendicular to the supports. Blocking shall be provided behind edges not located over supports.
- 3.6 Moisture barrier shall be applied over all wood wall sheathing, over studs to directly receive horizontal siding or board siding, over any wall sheathing to receive an unbacked stucco base, and over square edge wood subflooring to receive wood strip flooring. Moisture barrier over sheathing shall be applied horizontally, starting at the bottom, lapped 6 inches at edges and ends, and nailed at laps 16 inches on center. Moisture barrier over subfloor shall be applied as the strip flooring installation progresses and lapped 2 inches at edges and ends.
- SPECIES AND GRADE**

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Subflooring, Roof Sheathing, Wall Sheathing, Furring

Grading Rules	Species	Standard	Const Comm	No.2 Board	No.2 Comm	No.3 Comm
NHLA	Cypress					X
NELMA	Northern White Cedar					X
	Eastern White Pine	X				X
	Northern Pine	X				X
	Balsam Fir					X
NHPMA	Eastern Hemlock-Tamarack					
	Eastern White Pine					
	Northern Pine					
	Balsam Fir					
	Eastern Hemlock-Tamarack					
RIS	Redwood		X			
SCMA	Cypress				X	
SPIB	Southern Pine			X		
WCLB	Douglas Fir-Larch	X				
	Hem-Fir	X				
	Sitka Spruce	X				
	Mountain Hemlock	X				
	Western Cedar	X				
WWPA	Douglas Fir-Larch					X
	Hem-Fir					X
	Idaho White Pine					X
	Lodgepole Pine					X
	Ponderosa Pine					X
	Sugar Pine					X
	Englemann Spruce					X
	Douglas Fir South					X
	Mountain Hemlock					X
	Subalpine Fir					X
	Western Cedar					X

**Wood Trusses**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for maintenance and repair of wood trusses. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Structural glue-laminated timber shall comply with ANSI/AITC A190.1. Lumber for laminating shall be of a stress grade providing glue-laminated members with allowable stress values of 2,000 psi in bending, 1,600 psi in tension, 1,500 psi in compression parallel to grain, and 385 psi in compression perpendicular to grain for dry condition of service.

2.1.1 Adhesives shall meet requirements for dry condition of service.

2.1.2 Appearance of members shall be Industrial Grade. Plywood shall comply with DOC PS 1.

2.1.3 Surfaces of members shall be sealed with a penetrating sealer. Members shall be delivered individually wrapped. Do not unwrap until members are installed and adequate protection is provided.

2.2 Timber Connections:

2.2.1 Split-ring connectors shall be SAE 1010 hot-rolled carbon steel. Rings shall be of standard

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manufacture and shall fit snugly into pre-cut groove.

2.2.2 Shear Plate:

2.2.2.1 Pressed steel type shall be SAE 1010 hot-rolled carbon steel. Shear plates shall be of standard manufacture.

2.2.2.2 Malleable Iron Type: Casting shall comply with ASTM A 47, Grade 35018. Casting shall be of standard manufacture.

2.3 Fasteners:

2.3.1 Nails: Fed. Spec. FF-N-105.06135

2.3.2 Anchor Bolts, Lag Bolts, and Miscellaneous Bolts and Screws: ASTM A 307. Type, size, and finish shall be best suited for the intended use.

2.4 Saw Lumber:

2.4.1 Lumber shall be one of the following species and commercial grades:

2.4.1.1 Douglas Fir or Larch: Select structural (1500 f) or better.

2.4.1.2 Southern Pine: No. 1 (1500 f) or better.

2.4.1.3 Western Hemlock: Select structural (1500 f) or better.

2.4.2 Sizes, grading and marking shall comply with the requirements of the rules or standards under which produced, and unless otherwise indicated, lumber shall be surfaced on four sides. Dressed sizes shall be accepted as the minimum net sizes conforming to nominal sizes. Lumber shall be free from warp. All timber materials shall bear a grademark or other identifying marks indicating grades of material and standards under which produced. If lumber is treated, treatment and retention shall be indicated.

2.5 Preservative Treatment: All lumber shall be preservative-treated unless otherwise indicated. Pressure treat with water borne salt preservative. The retention shall be a minimum of 0.25 pounds per cubic foot. Treatment shall comply with Fed. Spec. TT-W-00571 and AWWA P5. Give all cuts and abrasions 2 brush coats of the same preservative as used at the factory.

2.6 Moisture Content: The moisture content of wood shall not exceed 15 percent at the time of treatment or installation.

3.0 EXECUTION:

3.1 Wiring Conflicts: Piping and electrical wiring conflicting with erection of members shall be removed and placed in a new position approved by the Authorized Member Representative. Provide temporary utilities and coordination to prevent outages during this period.

3.2 Connections: Drive nails and spikes with just sufficient force to set the heads flush with the surface of the wood. Drill bolt holes a maximum of 1/16 inch larger than the diameter of the bolt. A washer not less than a standard cut washer, or in lieu thereof a metal plate or strap, shall be between the wood and the bolt head and between the wood and the nut. Lag screw holes for the unthreaded portion of the shank shall be the same diameter as the shank and the same depth as the length of the unthreaded shank. The lead hole for the threaded portion of the shank shall be properly sized for species of lumber involved. Insert the threaded portion of the lag screw into its lead hole by turning with a wrench.

3.2.1 Nails: Use 8-penny or larger nails for nailing through 1-inch thick lumber and for toe nailing 2-inch thick lumber; use 16-penny or larger nails for nailing through 2-inch thick lumber. Size and spacing of nails shall comply with NFOPA Specification for Stress-Graded Lumber and its Fastenings.

3.2.2 Wood Screws: Lead holes for withdrawal resistance shall have a diameter of 70 percent of the root diameter of the wood screw. Lead holes for lateral resistance shall have a diameter of 7/8 of the root diameter of the wood screw. The part of the hole receiving the shank shall be about 7/8 the shank diameter. Insert screws in the lead holes by turning with a screw driver or other tool.

3.2.3 Timber Connections: Install the split ring and shear plate in grooves cut by the Contractor.

3.3 Truss Connections and Splices: Tighten all loose bolts and screws, adding washers as required. Remove and replace severely corroded or deteriorated bolts and screws.

3.4 Repair of Bearings and Anchor Bolts: Remove corrosion by wire brushing, sanding, or other approved method. Additional repair requirements shall be as directed.

3.5 Repair of Excessive Truss Deflection: Install tension turnbuckles or install a strengthening system as required to correct deflection.

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**Timber Bridge Components**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of timber bridge components. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Timber for bridges shall comply with the specifications for timber bridges contained in the state's standard specifications.
  - 2.2 Preservative treatment shall comply with the specifications for preservative treatment contained in the state's standard specifications. All timber shall be treated unless specified otherwise.
  - 2.3 Hardware and Castings:
    - 2.3.1 Castings: Cast steel shall comply with ASTM A 27, Grade 70-36, or gray iron castings shall comply with AASHTO M105 Class No. 30, unless otherwise specified.
    - 2.3.2 Hardware:
      - 2.3.2.1 Machine bolts, drift-bolts, and dowels may be either wrought iron or rolled steel. Machine bolts shall have the square heads and nuts unless otherwise specified.
      - 2.3.2.2 Cast washers shall be made of malleable or gray iron. The outside diameter shall not be less than 3 1/2 times the bolt diameter and its thickness equal to the bolt diameter. Plate washers shall be made of wrought iron or rolled steel. The outside diameter shall not be less than 3 1/2 times the bolt diameter, and they shall not be less than 1/4 inch thick.
      - 2.3.2.3 Nails and spikes shall comply with Fed. Spec. FF-N-105.
      - 2.3.2.4 Finish: Unless otherwise specified, all hardware for treated timber bridges shall be galvanized or cadmium-plated. Galvanizing shall comply with ASTM A 123 or A 153. Cadmium plating of steel shall comply with ASTM B 766.
  - 2.4 Timber connectors shall be ring type or plate type and shall be galvanized in compliance with ASTM A 123 or A 153.
    - 2.4.1 Split Ring: SAE 1010 hot-rolled carbon steel of standard manufacture.
    - 2.4.2 Tooth Ring: Stamped cold form 16-gauge steel sheet complying with SAE 1010 hot-rolled carbon steel of standard manufacture.
    - 2.4.3 Shear-plate timber connectors:
      - 2.4.3.1 Pressed steel type shall be SAE 1010 hot-rolled carbon steel of standard manufacture.
      - 2.4.3.2 Malleable iron type shall be ASTM A 47, Grade No. 36018 of standard manufacture.
  - 2.5 Structural glue-laminated timber shall comply with ANSI/AITC A190.1. Lumber for laminating shall be of such stress grade as to provide glue-laminated members with allowable stress values of 2,000 psi in bending, 1,600 psi in tension, 1,500 psi in compression parallel to grain, and 385 psi in compression perpendicular to grain for dry condition of service.
    - 2.5.1 Adhesives shall meet requirements for wet condition of service.
    - 2.5.2 Surfaces of members shall be sealed with a penetration sealer or sealed with a sealer coat.
  - 2.6 Ties: Comply with Section 3.1.1 of AREA-01 Manual. Ties shall be treated with creosote, creosote-petroleum solution, or pentachlorophenol in compliance with Section 3.9 of AREA-01.
  - 2.7 Asphalt cement shall comply with AASHTO M20, penetration grade 85-100.
  - 2.8 Surface coat aggregate shall be ASTM D 692, except the gradation shall be as follows:

Sieve Size	Percent Passing (Wt.)
1/2 in.	100
3/8 in.	94-100
No. 4	15-45
No. 16	0-4
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Traffic Control: When traffic is maintained on bridge under repair or is directed over a temporary run-around, furnish, erect, and maintain all barricades, flags, torches, lights, guardrails, temporary pavement markings, and traffic control signs required for the protection of the public and for the

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- direction of traffic. Number, type, color, size and placement of all traffic control color, size, and placement of all traffic control devices and the use of a flagman shall comply with USDOT FHA MUTCD "Traffic Controls for Highway Construction and Maintenance Operations." All traffic control devices in advance of the construction limits shall also be the responsibility of the Contractor.
- 3.1.2 Treated Timber: Give all cuts, abrasions, and holes made after treatment 2 applications of 60 percent creosote oil and 40 percent roofing pitch or brush coat with 2 applications of hot creosote oil and covered with hot roofing pitch. Any unfilled holes, after being treated with preservative oil, shall be plugged with treated plugs.
- 3.2 Erection:
- 3.2.1 Holes:
- 3.2.1.1 Drift Bolts and Dowels: Bore holes for round drift bolts and dowels with a bit 1/16 inch less in diameter than the bolt or dowel to be used. The diameter of holes for square drift bolts or dowels shall be equal to the least dimension of the bolt or dowel.
- 3.2.1.2 Machine Bolts and Rods: Bore holes for field fabrication with a bit the same diameter as the bolt. Holes for fabrication prior to treatment shall be 1/16 inch larger than the bolt diameter.
- 3.2.1.3 Lag Screws: Bore hole with a bit not larger than the body of the screw at the base of the thread.
- 3.2.2 Nuts and Washers: Use a washer of the size and type specified under all bolt heads and nuts except carriage bolts. The nuts of all bolts shall be locked by scoring threads after they have been finally tightened.
- 3.2.3 Countersinking: Paint all recesses in treated timber formed for countersinking with hot creosote oil. Fill recesses likely to collect injurious materials with hot pitch.
- 3.2.4 Framing: All lumber and timber shall be accurately cut and framed to a close fit in such manner that the joints will have even bearing over the entire contact surfaces. Place stringers in position so that knots near edges will be in the top portions of the stringer. Screw type fastenings shall be screwed into place for the entire length of the fastener. Install the split ring and the shear plate in grooves cut by the Contractor. Force the toothed ring into the contact surfaces of the timbers jointed by means of pressure equipment.
- 3.2.5 Nailing: Nails and spikes shall be driven with just sufficient force to set the heads flush with the surface of the wood.
- 3.3 Maintenance and Repair Methods:
- 3.3.1 Timber Deck:
- 3.3.1.1 Remove existing plank floor deck and fasteners and replace with new planks and fasteners. Lay the floor planks at 45 degrees to centerline of roadway. When more than one length of plank is required, stagger joints between abutting ends at least 3 feet in any two adjacent lines of plank.
- 3.3.1.2 Standard wrought washers shall be used under the heads of all lag screws and under the heads or nuts of all machine bolts. Where machine bolts are used for fastening the floor plank all nuts used shall be locknuts. Countersink heads of all lag screws and bolts in the surface of the floor. Fill recesses formed for countersinking with hot pitch.
- 3.3.1.3 Bituminous Surface Coat: Clean the floor of foreign materials. Apply asphalt cement at a temperature of 275 F to 350 F and at a rate of approximately 1/4 gallon per square yard of surface. The deck shall be dry at the time of bitumen application. Cover the entire surface with a thin coating of aggregate in a sufficient quantity to take up any free bitumen.
- 3.3.2 Hardware: Remove all corrosion by sandblasting or wire brushing. Replace all loose bolts and screws, adding washers as required. Replace deteriorated hardware.
- 3.3.3 Metal Tread Plates: Remove and replace treads as directed. Before installing treads, remove high spots and rough spots in the plank floor so that the treads will be in contact with the floor for their full length and width. Treads shall be laid in a heavy mop coat of asphalt filler. Treads shall be laid with a space of 1/4 inch between adjacent ends and shall be fastened by means of 3/8-inch galvanized bolts. Where bolts cannot be used, use 3/8-inch by 3-inch galvanized lag screws.
- 3.3.4 Timber Railroad Bridge Deck: Remove defective ties and guardrail, including fasteners, and replace with similar ties, guardrail, and fasteners as directed.
- 3.3.5 Repair of Structural Timber Members: Repair, including removal and replacement, shall be as directed.

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**Millwork**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of millwork. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 General: All millwork products shall be marked with manufacturer's identification and grade, in compliance with Architectural Woodwork Institute (AWI) quality grade. Products shall conform to applicable requirements of AWI Architectural Woodwork Quality Standards, Guide Specifications, and Quality Certification Program and Woodwork Institute of California (WIC) Manual of Millwork.
  - 2.2 Millwork: Millwork shall include the following representative examples of architectural woodwork:
    - a. Exterior cornices, fasciae, and soffits.
    - b. Trim for exterior and interior openings.
    - c. Frames for exterior and interior doors and other openings.
    - d. Casework.
    - e. Wood shelving.
  - 2.3 Wood Moisture Content: Lumber for millwork shall be kiln-dried to an average moisture content range of 9 percent to 13 percent for exterior work and 6 percent to 11 percent for interior work.
  - 2.4 Grade of Work: Interior millwork surfaces that are to receive transparent finishes shall be premium grade of the species selected. Millwork surfaces that are to be painted shall be custom grade of the species selected.
  - 2.5 Fire-Retardant Marking: Each unit of fire-retardant treated wood and plywood shall be marked with the producer's label and UL label showing grade and rating.
  - 2.6 Preservative Treatment: Exterior millwork and designated interior millwork shall be preservative-treated in accordance with NWWDA I.S.4. Use a preservative that will not interfere with the designated finish. Apply brush coat on surfaces cut after treatment.
- 3.0 EXECUTION: Millwork shall be installed plumb, level, true, and straight with no distortions. Millwork that abuts adjoining work shall be scribed and cut to fit. Millwork shall be installed with a minimum number of joints, coped at returns, mitered at corners, and shall comply with quality standards for joinery.

**Cabinets**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of cabinets. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Cabinets shall comply with ANSI/NKCA A161.1.
  - 2.2 Countertops shall comply with ANSI A161.2.
  - 2.3 Materials:
    - 2.3.1 Particleboard shall be ANSI A208.1 mat-formed particleboard, Grade 1-M-2 with minimum density of 40 lbs/cu ft, internal bond of 60 psi; and minimum screw holding capacity of 225 lbs on faces and 200 lbs on edges.
    - 2.3.2 Plastic laminate shall be NEMA LD 3.
    - 2.3.3 Hardwood plywood shall be HPMA FE.
    - 2.3.4 Hardwood lumber shall be clear, dry, sound, and free of defects, First Grade Lumber (NHLA).
    - 2.3.5 Hardboard shall be ANSI A135.4, Class 1, tempered.
    - 2.3.6 Decorative boards shall be low pressure melamine plastic laminate composite panels.
    - 2.3.7 Medium density fiberboard shall be ANSI A208.2.
  - 2.4.8 Transparent finish construction wood cabinet:
    - 2.4.1 Solid lumber and plywood face veneer shall be selected for compatible grain and color of the species.
    - 2.4.2 Semi-Exposed Materials:
      - 2.4.2.1 Solid Lumber: Dry, sound, selected to eliminate appearance defects, of any species of hardwood

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- or softwood, with color and grain characteristics similar to exposed portions.
- 2.4.2.2 Plywood: Species to match color and grain of exposed members; with particleboard core or veneer core.
- 2.4.3 Style of Face Construction: Provide base, wall, and full height units with drawer fronts, doors, and fixed panels overlaying and concealing face frames of cabinet body, as required.
- 2.4.4 Face Frame Style: Provide base, wall, and full height units with face frames of cabinets exposed around drawer fronts and doors.
  - 2.4.4.1 Drawer Fronts and Doors: Surface applied or recessed flush with cabinet front, as required.
  - 2.4.4.2 Flush Style Door Construction: Lumber core plywood, 5-ply with hardwood face veneers and crossbanding.
  - 2.4.4.3 Flush Style Drawer Fronts: Same construction as door, or solid or glued-up lumber, not less than 1/2 inch thick.
  - 2.4.4.4 Stile and Rail Drawer Fronts and Doors: Of design selected, with stiles and rails of solid lumber, 3/4 inch thick for doors and 5/8 inch thick for drawer fronts.
- 2.5 Countertop Construction:
  - 2.5.1 Exposed Surfacing Material: High pressure plastic laminate, 0.050 inch thick, general purpose type (GP50); except where postformed countertop configuration is required, when 0.042 inch thick, postforming type (PF42) shall be used.
  - 2.5.2 Substrate (Core) for Exposed Surfacing Material: Particleboard.
  - 2.5.3 Countertop Configuration: Provide countertops with front styles (nose), cove, and backsplash style, as required.
  - 2.5.4 Countertop Thickness: Not less than 1-1/2 inches with substrate (core) not less than 3/4 inch thick.
- 2.6 Cabinet Hardware: ANSI/BHMA A156.9.
- 2.7 Accessories: Provide designated accessories.
- 3.0 EXECUTION: (Section not used.)

**Wood Paneling**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of wood paneling. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 General: Paneling shall bear a stamp, brand, or other identifying mark indicating quality, construction and compliance with the grading rules of the respective grading and inspecting agency for the species and product indicated. Marking shall be placed on blind sides only.
  - 2.2 Plywood paneling shall be of softwood or hardwood veneers, as designated. Plywood shall comply with PS 1 and ANSI A199.1. Hardwood plywood shall comply with PS 51.
  - 2.3 Board type paneling shall be of softwood or hardwood, as designated. Softwood shall comply with PS 20. Hardwood shall comply with National Hardwood Lumber Association rules.
  - 2.4 Hardboard products type paneling shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less when tested in accordance with ASTM E 84.
- 3.0 EXECUTION:
  - 3.1 Preparation: Backprime material when exposed to moisture and high relative humidity.
  - 3.2 Installation:
    - 3.2.1 Plywood Paneling: Where grain character or color variations are noticeable, select and arrange panels on each wall for best match of adjacent panels. Install in accordance with manufacturer's instructions.
    - 3.2.2 Board Type Paneling: Arrange in random-width pattern unless boards are of uniform width. Install in accordance with manufacturer's instructions.
    - 3.2.3 Hardboard Products Type Paneling: Install in accordance with manufacturer's instructions.

**DIVISION 7-THERMAL AND MOISTURE PROTECTION**

**Bituminous Waterproofing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of bituminous waterproofing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Asphalt Waterproofing:
    - 2.1.1 Primer: Asphalt waterproofing material shall comply with Fed. Spec. SS-A-701.
    - 2.1.2 Bitumen: A heavy-bodied bituminous compound of trowel consistency, heavily reinforced with fiber, complying with Fed. Spec. SS-C-153, Type I.
  - 2.2 Tar Waterproofing:
    - 2.2.1 Primer: Creosote complying with ASTM D 43.
    - 2.2.2 Bitumen: Coal-Tar Pitch complying with ASTM D 450.
- 3.0 EXECUTION:
  - 3.1 Primer:
    - 3.1.1 Diluted Asphalt: Apply by brush or power spray in a continuous unbroken film, free from pinholes or other surface breaks.
    - 3.1.2 Creosote: Apply by brush, roller, or power spray.
  - 3.2 Bitumen:
    - 3.2.1 Asphalt: Apply a 1/16 inch coating by trowel in a continuous unbroken film. Wait 24 hours and apply a second 1/16 inch coating.
    - 3.2.2 Coal-Tar Pitch: Apply with mop or roller in a continuous, unbroken film, free from pinholes over any exposed surface area. Wait 24 hours and apply second coat.

**Bituminous Membrane Waterproofing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of bituminous membrane waterproofing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Asphalt Membrane Waterproofing:
    - 2.1.1 Primer: Asphalt waterproofing compound complying with Fed. Spec. SS-A-701.
    - 2.1.2 Joint Covering: Asphalt saturated felt, complying with ASTM D 250.
    - 2.1.3 Membrane: Burlap fabric, complying with ASTM D 1327; open mesh fiberglass, smooth, evenly woven to permit complete penetration of asphalt compound complying with ASTM D 1668, Type I; or asphalt-coated or saturated felt, complying with ASTM D 250.
    - 2.1.4 Bitumen: A heavy-bodied bituminous compound of trowel consistency complying with Fed. Spec. SS-C-153, Type I.
    - 2.1.5 Protection: A rigid or semi-rigid board for protection of membrane waterproofing from penetration by sharp objects during backfilling and later settlement. The board shall be an asphaltic core board or asphalt-saturated fiberboard complying with ASTM C 208. Thickness shall be 1/8 inch.
  - 2.2 Tar Membrane Waterproofing:
    - 2.2.1 Primer: Creosote complying with ASTM D 43.
    - 2.2.2 Joint Covering: Coal-tar saturated felt, complying with ASTM D 227.
    - 2.2.3 Membrane: Burlap fabric complying with ASTM D 1327; open mesh fiberglass, smooth, evenly woven to permit complete penetration of coal-tar compound; or coal-tar coated or saturated felt.
    - 2.2.4 Bitumen: Coal-tar pitch complying with ASTM D 450.
    - 2.2.5 Protection: A rigid or semi-rigid board for protection of membrane waterproofing from penetration by sharp objects during backfilling and later settlement shall be provided. The board shall be an asphaltic core board or asphalt saturated fiberboard. If used with coal-tar products, the board shall

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be faced with a polyethylene film to separate dissimilar materials. Thickness shall be 1/8 inch.

3.0 EXECUTION:

3.1 Installation:

3.1.1 Primer:

3.1.1.1 Diluted Asphalt: Apply by brush or power spray in a continuous unbroken film, free from pinholes or other surface breaks.

3.1.1.2 Creosote: Apply by brush, roller, or power spray.

3.1.2 Bitumen and Membrane:

3.1.2.1 Reinforce all inside and outside corners, joints, cracks, or places where stresses are likely to occur, with no less than two plies of fabric in alternate coats of bitumen.

3.1.2.2 All penetrations through the wall such as pipes, conduits, etc., shall be sealed with two additional plies.

3.1.2.3 Apply the specified number of plies of membrane material in alternate coats of bitumen.

3.1.2.4 For vertical applications, secure membranes near the top of each course.

3.1.2.5 Coat last ply of membrane with a thorough coat of bitumen.

3.2 Protection: As the membrane is completed, apply the protection course. Apply the protection board in a solid coating of asphalt or coal-tar pitch. All coatings must be dry before application of the protection board. Apply protection board by the lap method (lap each sheet 6 inches over preceding sheet) or by the batten method (butt each sheet then apply a 6-inch strip of protection board in adhesive over all joints).

**Plastic Sheet Waterproofing**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of plastic sheet waterproofing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Butyl Sheet shall be an impermeable butyl rubber membrane 1/16 inch thick having a tensile strength of 1,200 psi minimum, complying with ASTM D 412, and an elongation of 300 percent minimum, complying with ASTM D 412. Butyl sheet shall be resistant to ozone and remain flexible to 40 F below zero.

2.2 Neoprene Sheet shall be an impermeable, self-extinguishing, ozone-resistant material 1/16 inch thick. Neoprene shall have a tensile strength of 1,500 psi minimum, complying with ASTM D 412, and an elongation of 250 percent minimum, complying with ASTM D 412.

2.3 Ethylene Propylene Diene Monomers (EPDM) Sheet shall be an impermeable membrane resistant to ozone and ultraviolet. EPDM shall have a tensile strength of 1,400 psi minimum, complying with ASTM D 412, and an elongation of 300 percent minimum, complying with ASTM D 412.

2.4 Vinyl sheet shall be heavy-duty polyvinyl chloride sheet, complying with ASTM D 3083.

2.5 Primers: As required.

2.6 Adhesives:

2.6.1 Adhesive for cold application shall be a non-setting bitumen cut-back asphalt.

2.6.2 Adhesive for hot application shall be asphalt complying with ASTM D 312, Type III.

2.7 Butt Joint Tape: Elastomeric vapor barrier in 6-inch wide rolls. Tape shall be self-adhesive and require no additional adhesive.

3.0 EXECUTION:

3.1 Primer: Apply primer by brushing or spraying uniformly over surface to receive membrane. Allow primer to dry before applying membrane.

3.2 Membrane:

3.2.1 At footings, shape the membrane to conform to the surface by cutting a strip of sufficient width to seat over the footing and at least six inches up the wall.

3.2.2 On vertical surfaces, apply adhesive to both wall and membrane.

Attachment 1: Specifications for the Work

**Fluid-applied Waterproofing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of fluid-applied waterproofing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Two-Component Polyurethane: Two component, self-curing urethane system to form a seamless, permanently flexible and waterproof coating. Compound shall be a light-weight, 99 percent solids, liquid-applied system.
  - 2.2 Single Component Polyurethane: One-part moisture cured elastomeric urethane for adhesion to concrete or wood. Compound shall be hard, flexible material with resistance to weather, gas, oil, and salt water having a temperature range of -65 F to +200 F.
  - 2.3 Two-Component Polyurethane Rubber Base: Liquid-applied, elastomeric two component urethane rubber, 100 percent solids materials containing no coal-tar or asphaltic extenders. After proper mixing, with activators that are supplied as a unit, it shall cure to an elastomeric urethane rubber.
  - 2.4 Two-Component Polysulfide Base Liquid Polymer: Two-component, chemically-curing, high-solids compound containing liquid polysulfide polymer. Product shall be furnished in two components: Part 1, consisting of the cure agent and suitable reinforcing agents; Part 2, the base component, incorporating liquid polysulfide polymer.
  - 2.5 Modified Polyurethane Coal-Tar (Spray Grade): Two-part product, consisting of: Part 1, a blend of polyurethane resins, and Part 2, containing a selected blend of coal-tars, catalysts, and modifiers. The cured membrane shall be a seamless, low modulus, high elongation, physically and chemically resistant synthetic rubber.
  - 2.6 Modified Polyurethane Coal-Tar (Trowel Grade): One component polyurethane coal-tar modified compound that forms a continuous seamless, flexible, impervious membrane when applied to vertical or horizontal surfaces.
  - 2.7 Elastomeric Sheet Reinforcing: Smooth, evenly woven, open mesh glass fiber fabric weighing 1/4 ounce per square foot and which permits complete penetration of waterproofing compounds.
  - 2.8 Protection Board: Rigid or semi-rigid board for protection of membrane waterproofing shall be an asphaltic core board or an asphalt saturated fiberboard complying with ASTM C 208. Protection board shall be 1/8 inch thick. If used with coal-tar products, the board shall be faced with a polyethylene film to separate dissimilar materials.
- 3.0 EXECUTION:
  - 3.1 Two-Component Polyurethane:
    - 3.1.1 Prime surfaces as required.
    - 3.1.2 Spray machine mixed membrane coating directly onto the prepared surfaces to the desired thickness.
    - 3.1.3 Apply the second spray coat after application of the first coat.
  - 3.2 Single Component Polyurethane:
    - 3.2.1 Prime surfaces as required.
    - 3.2.2 Application shall be spray-applied.
    - 3.2.3 Below grade exterior applications shall receive two coats.
  - 3.3 Two-Component Polyurethane Rubber Base:
    - 3.3.1 Prime surfaces as required.
    - 3.3.2 Apply compound by hand trowel to a thickness of 1/16 inch.
    - 3.3.3 Before membrane is completely cured, place protection board over the surface.
  - 3.4 Two-component Polysulfide Base Liquid Polymer:
    - 3.4.1 Fill all joints and cracks over 1/8 inch in width with a polysulfide polymer base sealant. Apply a bond breaker over the joint and cover with 100 mil coating of the elastomeric material.
    - 3.4.2 Apply membrane by spray in a continuous unbroken film. Surface coverage shall be at the rate of approximately 20-25 square feet per gallon to produce a thickness of 60 mils.
  - 3.5 Modified Polyurethane Coal-Tar (Spray Grade):
    - 3.5.1 Prime surfaces with required primer.

Attachment 1: Specifications for the Work

- 3.5.2 Apply with proper spray equipment in a continuous unbroken film. Application rate shall be approximately 25 sq. ft. per gallon to produce a thickness of 60 mils.
- 3.6 Modified Polyurethane Coal-Tar (Trowel Grade):
  - 3.6.1 Prime surfaces with required primer.
  - 3.6.2 Mix and apply with hand trowel in a continuous unbroken film.
  - 3.6.3 Place protection board after membrane has attained its initial set.
- 3.7 Elastomeric Sheet Reinforcing for Fluid-Applied Waterproofing: Trowel fabric into first coat of membrane while membrane material is soft and pliable. Install sheet reinforcing in compliance with membrane compound manufacturer's requirements.
- 3.8 Protection Board:
  - 3.8.1 Apply protection board over membrane while membrane material is still tacky.
  - 3.8.2 Apply protection board by the lap method.

**Metal Waterproofing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of metal waterproofing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Lead sheet and strip shall be fabricated from 99 percent pure soft lead or lead alloy containing six to seven percent antimony. Four or eight pound per square foot lead shall be used for all work.
  - 2.2 Copper sheet and strip shall be fabricated of 16 or 20 ounce per square foot tough-pitch copper. Copper shall be either hot-rolled soft copper or cold-rolled copper. Copper shall have a lead coating of 15 pounds per 100 square feet of copper (7-1/2 pounds on each face of copperplate).
  - 2.3 Solder: Solder shall be 50 percent lead and 50 percent tin solder with a resin flux.
  - 2.4 Bituminous paint shall be high quality proper bodied bituminous (asphalt) compound of brush or spray consistency. Compound shall contain a hydrophilic wetting agent to ensure proper adhesion. Bituminous paint shall comply with Fed. Spec. SS-A-701.
- 3.0 EXECUTION:
  - 3.1 Lead Pan Waterproofing:
    - 3.1.1 Preparation: All surfaces on which lead is to be applied shall be smooth; rough projections shall be eliminated. Lead surfaces in contact with uncured concrete, mortar, or in other corrosive locations shall be given a coat of bituminous paint prior to installation.
    - 3.1.2 Small holes and spot repairs shall be accomplished by soldering the leak spots.
    - 3.1.3 Large damaged areas shall be cut out and replaced with lead sheet or strip of the proper weight lead. Apply a coating of bituminous paint to the affected area after the new sheet or strip lead has been soldered in place.
    - 3.1.4 Joints: Use optimal size of sheet or strip to compensate for expansion. Pre-tin all soldered joints and clean immediately after soldering. All joints shall be soldered.
    - 3.1.5 Corners: Wall sheets shall end short of corners. Mold full sheet around corners and joint with wall sheets each side of corner.
  - 3.2 Copper Waterproofing:
    - 3.2.1 Preparation: All surfaces on which copper is to be applied shall be smooth; rough projections shall be eliminated. Give copper surfaces in contact with uncured concrete, mortar, dissimilar metals, or in other corrosive locations a coat of bituminous paint prior to installation.
    - 3.2.2 Fabrication: Prefabricate shapes as required. Copper sheet and strip shall be bent only to rounded angles with no sharp creases.
    - 3.2.3 Small holes and spot repairs shall be accomplished by soldering.
    - 3.2.4 Large damaged areas shall be cut out and replaced with copper sheet or strip of proper weight. Apply a coating of bituminous paint to the affected area after the new sheeting or strip copper has been soldered in place.
    - 3.2.5 Joints: Use optimal size sheet or strip to compensate for expansion. Pre-tin all soldered joints and clean immediately after soldering.

**Bentonite Clay Waterproofing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of bentonite clay waterproofing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Preformed Bentonite Clay Panels and Tubes:
    - 2.1.1 Panels shall be made of dry bentonite granules packed into the corrugated flutes of biodegradable Kraft boards. Panels shall be four feet square by 3/16 inch thick and weigh 18 pounds.
    - 2.1.2 Tubes shall be a water soluble polyvinyl alcohol container filled with dry granular bentonite and hermetically sealed. Tubes shall be two-inch diameter by two-foot lengths and weigh approximately three pounds.
  - 2.2 Bentonite Gel: Clay composition of hydrated aluminum silicate, which swells upon absorption of water into a thick gel.
  - 2.3 Joint Seal: A hydrated bentonite gel for trowel application to concrete for sealing construction joints, form tie voids, and wall penetrations.
  - 2.4 Joint-pak Containers: A biodegradable Kraft container filled with dry bentonite granules for preformed concrete joints in below grade foundation walls. Standard joint-paks shall be 1-1/4 x 1-1/4 inches, weighing approximately 1.1 pounds. Provide triangular-shaped cross section 2-3/8 x 2-3/8 x 2-3/8 inches x 2 feet long, weighing approximately 3 pounds for inside corner joints.
  - 2.5 Chemically Modified Bentonite For Spray Application: High pressure spray combining bentonite clay with a modified asphalt binder that adheres the bentonite to vertical surfaces. Clay content shall be 1-1/2 pounds per square foot.
  - 2.6 Moisture Barrier: 4 mil polyethylene sheeting complying with ASTM D 2103.
  - 2.7 Protection Board: Multi-ply, semi-rigid board composed of a mineral fortified asphaltic core between a layer of asphalt saturated liner and a weathercoated glass mat liner with polyethylene film facing. Protection board shall be 4 feet by 8 feet by 1/8 inch.
  - 2.8 Masonry Nails: 2-inch minimum by No. 9 fluted masonry nails with 1-inch minimum diameter disks complying with Fed. Spec. FF-N-105 for fastening panels to concrete and masonry walls.
- 3.0 EXECUTION:
  - 3.1 Maintenance and Repair Methods:
    - 3.1.1 Preformed Bentonite Panels:
      - 3.1.1.1 Prior to installation of panels, parge all joints and cracks with joint seal to 1/8-inch minimum depth and 3-inch minimum width. Apply panels with masonry nails, joint seal, or approved mastic. Fold and attach panels around corners with corrugations horizontal. Lap all adjoining panel edges 1 1/2 inches and stagger vertical joints of succeeding courses.
      - 3.1.1.2 Install polyethylene sheeting immediately after panels are installed to provide temporary protection to bentonite panels against moisture. Overlap sheeting four inches. Apply sheeting with adhesive.
      - 3.1.1.3 Install protection board with the asphalt-saturated felt face against the waterproofing for protection from damage by maintenance and repair activities including backfilling.
      - 3.1.1.4 Bentonite Tubes: Place bentonite tubes along the base of the first panel course on sidewall applications to provide protection at the footing-foundation joint.
    - 3.1.2 Chemically Modified Bentonite Spray:
      - 3.1.2.1 Remove damaged material if damage is extensive, and completely clean area of application.
      - 3.1.2.2 If small spot repair is all that is required, cover damaged area with bentonite panel or pour loose dry granular bentonite adjacent to the damage.
      - 3.1.2.3 For large scale repair work, apply a spray coating of minimum 3/8-inch bentonite to the damaged surface.
      - 3.1.2.4 At foundation-footing joint spray, application shall be two inches thick in a cove or cant configuration.
      - 3.1.2.5 Spray joints with a double thickness, resulting in a membrane 3/4 inch to one inch thick. For

Attachment 1: Specifications for the Work

small areas, joint seal may be trowel-applied.

3.1.3 Miscellaneous Joint Seals:

- 3.1.3.1 Bentonite gel shall be trowel-applied to concrete for sealing construction joints, form tie voids, and wall penetrations.
- 3.1.3.2 Bulk granular Bentonite may be poured at the base joints of walls and foundations.
- 3.1.3.3 Press joint-pak containers filled with dry granular bentonite into preformed joint cavities next to PVC waterstop in joints between two concrete pours.

**Bituminous Dampproofing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of bituminous dampproofing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Asphalt Dampproofing:
    - 2.1.1 Primer: Fed. Spec. SS-A-701.
    - 2.1.2 Cement, Bituminous Plastic: ASTM D 449. A heavy-bodied asphalt emulsion of brush or power spray consistency.
    - 2.1.3 Asphalt: ASTM D 449. Hot asphalt or asphalt emulsions for mop application.
  - 2.2 Tar Dampproofing:
    - 2.2.1 Primer: Creosote complying with ASTM D 43.
    - 2.2.2 Bitumen: Coal-tar pitch complying with ASTM D 450.
- 3.0 EXECUTION:
  - 3.1 Preparation: Remove all materials completely, exposing the base surfaces to which the dampproofing materials are to be applied.
  - 3.2 Installation:
    - 3.2.1 Application of Dilute Asphalt Emulsion Primer: Brush or spray in a continuous unbroken film, free from pinholes or other surface breaks.
    - 3.2.2 Application of Creosote Primer: Apply with a brush or roller to entire surface.
    - 3.2.3 Interior and Exterior Cold Application: Brush or spray apply without thinning in a continuous unbroken film, free from pinholes or other surface breaks. Apply to entire primed area.
    - 3.2.4 Exterior Hot Application:
      - 3.2.4.1 Coal-Tar Pitch: Apply over exposed surface area with mop or roller in a continuous, unbroken film, free from pinholes.
      - 3.2.4.2 Asphalt: Mop two coats of hot asphalt over the entire primed area. Use not less than 25 pounds per 100 square feet.

**Silicone Dampproofing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of silicone dampproofing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of material shall be as required to support the work.
- 2.0 PRODUCTS: Silicone water repellent (5 percent solution) shall be a clear, ready to use liquid consisting of polymerized silicone resins and penetrating hydrocarbon solvents specifically formulated to repel water. Silicone solution shall comply with Fed. Spec. SS-W-110.
- 3.0 EXECUTION:
  - 3.1 Precautions: Immediately remove any solution that comes in contact with glass surfaces. Protect glass surfaces with polyethylene.
  - 3.2 Installation: Apply silicone solution by brush or a low pressure spray unit. If pumped from a barrel, use an agitator. Apply in one or two coats so that the surface is flooded to the point of maximum absorption. Start at top and work down, providing a continuous rundown of 6 to 12 inches during application. Start at top with second coat as soon as drop has been made.

**Water-repellent Coating Dampproofing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of water-repellent coating dampproofing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 General: The materials shall be colorfast, non-yellowing, and impervious to the following solutions:
    - Water.
    - One percent soap solution.
    - Salt solutions.
    - Most dilute acids.
    - Most alkalis.
    - Urine.
    - Color fast and non-yellowing.
  - 2.2 Acrylic Sealers: Clear, water-white, non-staining sealing compound shall consist of a blend of penetrating and film-forming materials in a petroleum distillate and a methacrylate resin and shall have a flash point (tag open cup) of 82 F minimum. The product must breathe and have the ability to be later recoated without any special treatment.
  - 2.3 Polymeric Resins: Clear, colorless, inorganic polymer water repellents for impregnating and hardening the surfaces. The product must breathe and have the ability to be later recoated without any special treatment.
  - 2.4 Polyester Resins: A mixture of modified polyester resins.
  - 2.5 Butyrate Resins: Clear liquid, one component mixture of selected butyrate resins in a mineral spirit base.
- 3.0 EXECUTION:
  - 3.1 Preparation: Prior to application of dampproofing, fill voids, cracks, and holes with cement mortar.
  - 3.2 Installation: Coating may be applied by conventional spray equipment, airless spray equipment, brush, or roller.

**Cementitious Dampproofing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of cementitious dampproofing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Portland cement: ASTM C 150, Type I cement shall be used when the special properties of other types are not required.
  - 2.2 Sand: Washed silica sand graded within the following limits:

Sieve	Percent Passing
No. 4	95 to 100
No. 8	80 to 100
No. 16	50 to 85
No. 30	25 to 60
No. 50	10 to 30
No. 100	2 to 10
  - 2.3 Water: Clean, fresh, and free from injurious amounts of oil, acid, salt, alkali, organic matter, or other deleterious substances.
  - 2.4 Bonding Agent:
    - 2.4.1 A re-emulsifiable one-component liquid resinous emulsion shall be used where area is not subject to constant dampness.
    - 2.4.2 A two-component epoxy resin compound shall be used in areas under damp conditions.

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- 2.5 Waterproofing Admixtures: A calcinated solution of colloidal resonates that increases impermeability, workability, and compressive strength of mortar.
- 3.0 EXECUTION:
- 3.1 Preparation: Remove all materials completely, exposing the base surfaces to which the dampproofing materials are to be applied.
- 3.2 Installation:
  - 3.2.1 Bonding Agent: Apply as required.
  - 3.2.2 Bearing Surface: Parge or apply a coating of the cementitious mixture to the areas to be dampproofed, using a brush or trowel. Minimum thickness shall be 1/4 inch.

**Bituminous Vapor Barrier for Roofs**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of bituminous vapor barriers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Asphalt Primer: ASTM D 41.
  - 2.2 Bitumen:
    - 2.2.1 Asphalt: ASTM D 312, Type III, steep asphalt.
    - 2.2.2 Coal-Tar Pitch: ASTM D 450, Type A, for slopes up to and including 1/2 inch per foot.
  - 2.3 Bituminous Cement: Fed. Spec. SS-C-153.
    - 2.3.1 Type I: For use with asphalt saturated felts.
    - 2.3.2 Type II: For use with coal-tar saturated felts.
  - 2.4 Vapor Barrier Membrane:
    - 2.4.1 Asphalt Saturated Organic Felt: ASTM D 226, No. 15, asphalt saturated organic fiber felt weighing approximately 13 pounds per square.
    - 2.4.2 Asphalt Saturated Inorganic Felt: ASTM D 250, No. 15, asphalt saturated asbestos fiber felt weighing approximately 13 pounds per square.
    - 2.4.3 Coated Base Sheet: ASTM D 2626, asphalt saturated organic fiber roofing felt, both faces coated with asphalt including mineral stabilizers and mineral surfacing, weighing not less than 37 pounds per square.
    - 2.4.4 Coal-Tar Saturated Felt: ASTM D 227, No. 15 coal-tar pitch saturated organic felt weighing minimum of 13 pounds per square.
    - 2.4.5 Sheathing Paper: Rosin-sized sheathing paper weighing not less than 5 pounds per square or saturated felt weighing approximately 7-1/2 pounds per square.
- 2.5 UL Listing: Bituminous vapor barrier materials of roofing systems which have been tested for application and slopes and are listed by Underwriters' Laboratories, Inc. (UL) for Class A or Class B external fire exposure shall be provided. Bituminous vapor barrier materials shall bear the Classification marking (UL) on bundle, package, or container indicating that materials have been produced under UL's Classification and Follow-Up Service.
- 2.6 FM Listing: Bituminous vapor barrier materials of roofing systems that have been evaluated by Factory Mutual System for fire spread, wind uplift, and hail damage are listed in the "Factory Mutual Approval Guide" for Class 1 construction. Bituminous vapor barrier materials bearing FM's examination and follow-up inspection service shall be provided.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Concrete Decks: Prior to installation of vapor barrier, apply asphalt primer at the rate of 1 gallon per square over area to receive vapor barrier.
    - 3.1.2 Precast Concrete Decks: Prior to installation of vapor barrier, cover joints between precast units with a 4-inch to 6-inch wide strip of roofing felt embedded in, and coated with, bituminous cement. Prime deck surface to receive vapor barrier with asphalt primer applied at rate of 1 gallon per square.
    - 3.1.3 Wood Deck: Prior to installation of vapor barrier, apply one layer of sheathing paper over areas to be surfaced with vapor barrier.

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- 3.2 Installation:
  - 3.2.1 Laying Felts: Lay vapor barrier free of wrinkles or bubbles, at right angles to the slope of the deck.
  - 3.2.2 Mopping: Solid mop heated bitumen under and between felts.
  - 3.2.3 Embedment in Bitumen: Broom in felts with 18-inch or 20-inch wide soft fiber type broom.
  - 3.2.4 Nailing Felts: Drive nails and fasteners for securing roofing flush through flat metal disks. •07192
  - 3.2.5 Embedding Vapor Barrier at Roof Edge: Embed vapor barrier felts in 9-inch wide solid coat of bituminous plastic cement.
- 3.3 Installation to Non-Nailable Deck:
  - 3.3.1 Asphalt Saturated Felt System: Vapor barrier system shall consist of two-ply asphalt saturated felts embedded in solid moppings of asphalt applied at rate of 15 to 20 pounds per square per ply.
  - 3.3.2 Coal-Tar Saturated Felt System: Vapor barrier system shall consist of two-ply coal-tar saturated felts embedded in solid moppings of coal-tar pitch applied at rate of 20 to 30 pounds per square per ply.
  - 3.3.3 Coated Base Sheet System: Vapor barrier system shall consist of two-ply coated base sheet embedded in solid moppings of asphalt applied at rate of 20 pounds per square per ply.
- 3.4 Installation to Nailable Deck:
  - 3.4.1 Asphalt Saturated Felt System: Vapor barrier system shall consist of two-ply asphalt saturated felt, first ply laid dry and second ply embedded in solid mopping of asphalt applied at rate of 15 to 20 pounds per square.
  - 3.4.2 Coal-Tar Saturated Felt System: Vapor barrier system shall consist of two-ply coal-tar saturated felts, first ply laid dry and second ply embedded in solid mopping of coal-tar pitch applied at rate of 20 to 30 pounds per square.
  - 3.4.3 Coat Base Sheet System: Vapor barrier system shall consist of two-ply coated base sheet. Apply first ply dry. Embed second ply in solid coating of asphalt applied at the rate of 15 to 20 pounds per square.
  - 3.4.4 Attachment to Existing Vapor Barrier Membrane: Install a 25-inch wide strip of vapor barrier felt; lap

**Laminated Sheet Vapor Barrier for Roofs**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of laminated sheet vapor barrier for roofs. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Vapor Barrier:
    - 2.1.1 Reinforced Paper Laminate: Two layers of high strength Kraft papers laminated together with asphalt, reinforced with glass fiber, with vapor transmission rating of 0.2 perm or less when tested in accordance with ASTM E 96.
    - 2.1.2 Polyethylene Sheet Laminate: Two layers of high strength Kraft papers, laminated, with polyethylene sheet between, with vapor transmission rating of 0.2 perm or less when tested in accordance with ASTM E 96, Procedure A.
  - 2.2 Adhesive: Water-resistant adhesive with a nontoxic vehicle. Adhesive shall be vapor barrier manufacturer's recommended product and shall be compatible with contact surfaces.
  - 2.3 Asphalt: ASTM D 312, Type III, steep asphalt.
  - 2.4 Vapor Barrier Joint Strips: Vapor barrier material cut into strips, approximately 6 inches wide.
  - 2.5 UL Listing: Laminated sheet vapor barrier materials of roofing systems which have been tested for application and slopes and are listed by Underwriters' Laboratories, Inc. (UL) for Class A or Class B external fire exposure shall be provided. Laminated sheet vapor barrier materials shall bear the Classification marking (UL) on bundle, package, or container indicating that materials have been produced under UL's Classification and Follow-Up Service.
  - 2.6 FM Listing: Laminated sheet vapor barrier materials of roofing systems which have been evaluated by Factory Mutual system for fire spread, wind uplift, and hail damage are listed in the "Factory Mutual Approval Guide" for Class 1 construction. Laminated sheet vapor barrier materials bearing FM's examination and follow-up inspection service shall be provided.

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3.0 EXECUTION:

- 3.1 Preparation: Surfaces to receive vapor barrier membrane shall be smooth, with no protruding surfaces that would puncture membrane.
- 3.2 Installation:
  - 3.2.1 Application of Vapor Barrier with Adhesive: Lay vapor barrier sheet directly on deck in ribbons of adhesive approximately 1/2 inch wide and spaced 6 inches on center.
  - 3.2.2 Application of Vapor Barrier with Asphalt: Lay vapor barrier sheet directly on deck in solid coat of asphalt applied at rate of 15 to 25 pounds per square.
  - 3.2.3 Laps: Side laps shall be not less than 2 inches, and end laps shall be not less than 6 inches.
  - 3.2.4 Nailable Decks: Nail lapped areas, spacing nails maximum of 12 inches on center.
  - 3.2.5 Sealing Joints: Seal joints in vapor barrier system and seal to other surfaces at extremities of coverage with vapor barrier strips.

**Polyvinyl Sheet Vapor Barrier for Roofs**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of polyvinyl sheet vapor barriers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Vapor Barrier: Polyvinyl chloride sheet, minimum 4 mils thick, with vapor transmission rating of 0.2 perm or less when tested in compliance with ASTM E 96.
  - 2.2 Adhesive: Water-resistant adhesive with a nontoxic vehicle specially prepared for application of polyvinyl sheet membrane to roof decks.
  - 2.3 Vapor Barrier Tape: Aluminum foil, minimum 1 mil thick, laminated between two sheets of polyester film with pressure-sensitive adhesive on one face, vapor transmission of 0.015 perm or less.
  - 2.4 Vapor Barrier Joint Strips: Vapor barrier material cut into strips, approximately 6 inches wide.
  - 2.5 UL Listing: Polyvinyl sheet vapor barrier materials of roofing systems which have been tested for application and slopes and are listed by Underwriters' Laboratories, Inc. (UL) for Class A or Class B external fire exposure shall be provided. Polyvinyl sheet vapor barrier materials shall bear the Classification marking (UL) on bundle, package, or container indicating that materials have been produced under UL's Classification and Follow-Up Service.
  - 2.6 FM Listing: Polyvinyl sheet vapor barrier materials of roofing systems which have been evaluated by Factory Mutual system for fire spread, wind uplift, and hail damage are listed in the "Factory Mutual Approval Guide" for Class 1 construction. Polyvinyl sheet vapor barrier materials bearing FM's examination and follow-up inspection service shall be provided.
- 3.0 EXECUTION:
  - 3.1 Preparation: Surfaces to receive vapor barrier membrane shall be smooth, with no protruding surfaces that would puncture membrane.
  - 3.2 Installation:
    - 3.2.1 Installation of Basic Membrane: Lay polyvinyl sheet directly on deck in solid covering of approved adhesive.
    - 3.2.2 Nailable Decks. Nail lapped areas, spacing nails maximum of 12 inches on center.
    - 3.2.3 Sealing Joints. Seal joints in vapor barrier system and seal to other surfaces at extremities of coverage with vapor barrier tape or vapor barrier strips.

**Bituminous Vapor Barriers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of bituminous vapor barriers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:

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- 2.1 Asphalt Vapor Barrier: Provide one of the following:
  - 2.1.1 A proper-bodied bituminous coating of brush or spray consistency for application to interior masonry walls above or below grade, containing a hydrophilic agent that assures proper adhesion. Compound shall comply with ASTM D 449.
  - 2.1.2 A soft, adhesive "self-healing" hot mop type asphalt that flows readily under the mop and is not susceptible to wide temperature ranges. Compound shall comply with ASTM D 449, Type B. Used with a cold-applied primer complying with ASTM D 41.
- 2.2 Tar Vapor Barrier: Primer shall be coal-tar pitch complying with ASTM D 43 Type B for use below ground level under uniformly moderate temperature conditions, both during the process of installation and during service. The coal-tar pitch shall be homogeneous and shall comply with the requirements prescribed in Table I, ASTM D 450.
- 2.3 Reinforcing shall be tar-saturated felt complying with ASTM D 227 or glass mat complying with ASTM D 1668.
- 3.0 EXECUTION:
  - 3.1 Preparation: Remove all materials completely, exposing the base surfaces to which the dampproofing materials are to be applied.
  - 3.2 Installation: Below grade applications shall receive two coats. Allow 24 hours between coats.
  - 3.3 Reinforcing Method: Reinforce all inside and outside corners, joints, cracks, or places where stresses are likely to occur with no less than 2 plies of felt or glass mat.

**Laminated Sheet Vapor Barriers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of laminated sheet vapor barriers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Bonded Multi-Ply Flexible Core Board:
    - 2.1.1 Board with core plies of polyvinyl chloride shall consist of a core sheet of polyvinyl chloride suspended between two layers of pure-blown, high melt point asphalt and sandwiched between two asphalt saturated felt liners. The felt liners shall be covered with an asphalt weathercoat.
    - 2.1.2 Semi-rigid asphalt board shall consist of an asphalt core sandwiched between two saturated felt liners to which an independent weather-coating is bonded.
    - 2.1.3 Self-adhesive multi-ply flexible board shall consist of a 1/16-inch thick waterproof highly flexible elastomeric material with a release paper on one side. The membrane shall be bonded to a reinforcing carrier sheet, vinyl center sheet, additional bitumen, and a protective weathercoating.
  - 2.2 Bonding Agent:
    - 2.2.1 Hot asphalt for bonding to vertical surfaces or sealing joints shall be a mopping asphalt with a softening point in the range of 180 to 200 F and complying with ASTM D 312, Type III.
  - 2.3 Butt Joint Tape: Elastomeric vapor barrier shall be in 6-inch wide rolls. Tape shall be self-adhesive and require no additional adhesive.
- 3.0 EXECUTION: Remove all materials completely, exposing the base surfaces to which the dampproofing materials are to be applied.

**Plastic Sheet Vapor Barriers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of plastic sheet vapor barriers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Polyethylene Sheet shall comply with ASTM D 2103.
  - 2.2 Butyl sheet shall be an impermeable butyl rubber membrane 1/16 inch thick having a tensile strength per ASTM D 412 of 1,200 psi minimum and an elongation per ASTM D 412 of 300 percent

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- minimum. Butyl sheet shall be resistant to ozone and remain flexible to 40 degrees F below zero.
- 2.3 Neoprene sheet shall be an impermeable, self-extinguishing, ozone-resistant material, 1/16 inch thick. Neoprene shall have a tensile strength per ASTM D 412 of 1,500 psi minimum and an elongation per ASTM D 412 of 250 percent minimum.
  - 2.4 Ethylene Propylene Diene Monomer (EPDM) sheet shall be an impermeable membrane resistant to ozone and ultra-violet radiation. EPDM shall have a tensile strength per ASTM D 412 of 1,400 psi minimum and a elongation per ASTM D 412 of 300 percent minimum.
  - 2.5 Vinyl sheet shall be a heavy-duty polyvinyl chloride sheet complying with ASTM D 3083.
  - 2.6 Primers shall be as required.
  - 2.7 Adhesives:
    - 2.7.1 Adhesive for cold application shall be a non-setting bitumen cutback asphalt.
    - 2.7.2 Adhesive for hot application shall be asphalt complying with ASTM D 312, Type III.
  - 2.8 Butt joint tape shall be an elastomeric vapor barrier in 6-inch wide rolls. Tape shall be self-adhesive and require no additional adhesive.
  - 3.0 EXECUTION:
    - 3.1 Preparation: Remove all materials completely, exposing the base surfaces to which the dampproofing materials are to be applied.
    - 3.2 Installation:
      - 3.2.1 Primer: Apply primer by brushing or spraying uniformly over surface to receive membrane.
      - 3.2.2 Membrane:
        - 3.2.2.1 At footings, shape the membrane to conform to the surface.
        - 3.2.2.2 Apply adhesive to both the footing and to the membrane.
        - 3.2.2.3 On vertical surfaces, apply adhesive to both wall and membrane.
        - 3.2.2.4 Seal joints between adjacent sheets centering 6-inch sealing tape over the joint.

**Batt and Blanket Building Insulation**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of batt and blanket building insulation. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Mineral Fiber Insulation shall comply with ASTM C 665, Type II.
  - 2.2 Reflective Insulation shall comply with ASTM C 665, Type III.
  - 2.3 Membrane Covering: All vapor permeable back surface coverings, membrane coverings, or facings affixed to insulation in compliance with ASTM E 84 shall have a flame spread rating not greater than 25 and a smoke developed rating not greater than 50 when tested.
  - 2.4 Separately Applied Vapor Barriers:
    - 2.4.1 General: Separate vapor barrier material shall have a permeability of 1.0 perm or less, in compliance with procedure "A" of ASTM E 96.
    - 2.4.2 Ground cover for crawl spaces: Ground cover for crawl space applications shall have a permeability of 0.5 perm or less, in compliance with ASTM E 154.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Separately Applied Vapor Barriers: All surfaces on which separately applied vapor barrier material is to be applied shall be free of any projections that might puncture the vapor barrier material.
    - 3.1.2 Masonry Wall Applications: Provide wood fastening strips for fastening rigid insulation to masonry walls.
  - 3.2 Installation. Install insulation to a thickness necessary to provide the designated or directed R-value.
    - 3.2.1 Exterior Walls:
      - 3.2.1.1 Insulate each space between framing members completely with batt or blanket type insulation sized to fit the full width of the space.
      - 3.2.1.2 Install insulation having an affixed facing with the facing toward the interior (warm-in-winter)

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side of the construction.

- 3.2.1.3 Install reflective insulation with an air space of not less than 3/4 inch, adjacent to the reflective facing, when insulation thickness permits.
- 3.2.1.4 Crawl Spaces (Unvented): Contractor shall cut vent openings in exterior walls of crawl spaces, frame as necessary to reinforce the openings, and install wood or aluminum louvers and screening.
- 3.2.1.5 Crawl Spaces (Vented): Insulate each space between framing members completely with batt or blanket type insulation sized to fit the full width of the space.
- 3.2.1.6 Ceiling: Insulate each space between framing members completely with batt or blanket type building insulation, sized to fit the full width of the space. Install insulation around, not over, all recessed lighting fixtures in ceiling construction. Install insulation so as to permit air passage from eave vents to air space above insulation.

**Loose or Granular Fill Insulation**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of loose or granular fill insulation. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Mineral fiber insulation shall comply with Fed. Spec. HH-I-1030, Type I, Class A or B.
  - 2.2 Perlite insulation shall comply with ASTM C 549, treated for water repellency.
  - 2.3 Vermiculite insulation shall comply with ASTM C 516, Type II, treated for water repellency.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Cavity Applications: Close off all openings in cavities to receive loose or granular fill insulation, except at the top so as to permanently prevent insulation from escaping.
    - 3.1.2 Ceiling Applications: Wherever loose or granular fill insulation is to be applied over dropped soffit or other large cavities exposed to the attic, install fiberboard or other suitable material between framing members over soffit cavity to support insulation.
  - 3.2 Installation:
    - 3.2.1 Install insulation to a thickness necessary to provide the designated R-value.
    - 3.2.2 Install insulation to completely fill all required ceiling and horizontal areas.

**Rigid Insulation**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of rigid insulation. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Mineral fiberboard insulation shall comply with Fed. Spec. HH-I-558, Form A, class as specified.
  - 2.2 Polystyrene plastic board insulation shall comply with ASTM C 578, Type II.
  - 2.3 Urethane plastic board insulation shall comply with Fed. Spec. HH-I-530, Type I, Class 2.
  - 2.4 Cellular glass block insulation shall comply with ASTM C 552, Type I.
  - 2.5 Organic fiberboard insulation shall comply with ASTM C 208. Organic Fiberboard Insulation shall be chemically treated to resist decay, fungus growth, and insect attack.
  - 2.6 Corkboard insulation shall comply with ASTM C 640.
  - 2.7 Glass fiberboard insulation shall comply with Mil. Spec. MIL-I-742.
- 3.0 EXECUTION:
  - 3.1 Preparation: All surfaces to which rigid insulation will be mastic-mounted shall be free from all materials that will prevent proper adhesion.
  - 3.2 Installation: Install insulation to a thickness necessary to provide the designated R-value.

**Perimeter Insulation**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of perimeter

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insulation. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

- 2.1 Polystyrene insulation board shall comply with ASTM C 578, Type I.
- 2.2 Urethane insulation board shall comply with Fed. Spec. HH-I-530, Type I, Grade 2, Class 1. Urethane insulation board shall have a minimum density of 1.7 pounds per cubic foot.
- 2.3 Insulation thickness shall be 1 inch, except where otherwise specified or directed.
- 2.4 Surface Burning Characteristics: Insulation shall have a maximum flame spread index of 25, in compliance with ASTM E 84.
- 2.5 Plastic cement shall comply with Fed. Spec. SS-C-153.
- 2.6 Asphalt-saturated felts shall comply with ASTM D 226, Type I.
- 2.7 Adhesive or mastic for bonding insulation shall comply with applicable fire-resistance requirements for the insulation being installed.

3.0 EXECUTION:

- 3.1 Preparation: The Contractor shall remove all materials and construction necessary to gain access to the work.
- 3.2 Installation: Apply insulation to the full thickness required over the entire area to be insulated.
- 3.3 Reconstruction: Restore existing slabs, construction, and finishes that have been removed for the installation of insulation or damaged to their original condition.
- 3.4 Restoration of Landscaping: Restore landscaping that is disturbed to its original condition.

**Sprayed-on Insulation**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of sprayed-on insulation. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

- 2.1 Urethane foamed-in-place insulation shall be a spray-applied two-component material that when mixed together in proper proportions produces a rigid closed cell foam material.
  - 2.1.1 Physical properties of cured foam shall be as follows:
    - 2.1.1.1 Nominal density shall be 1.5 to 2.5 lbs/cu ft (ASTM D 1622).
    - 2.1.1.2 Closed cell content shall be 90 percent minimum.
    - 2.1.1.3 Compressive strength, parallel to rise, shall be 40 psi.
    - 2.1.1.4 Thermal conductivity (k factor) Btuh/psf/F/in. shall be 0.17 when aged 90 days at 14 F dry heat (ASTM C 518).
    - 2.1.1.5 Vapor transmission shall be 3.0 perm-inch.
    - 2.1.1.6 Water absorption shall be 3.0 percent.

3.0 EXECUTION:

- 3.1 Substrates shall be cleaned prior to application of sprayed-on insulation.
- 3.2 Openings in roofs to receive foamed-in-place insulation shall be closed sufficiently to prevent escape of insulation.
- 3.3 Protect installed insulation from harmful weather exposures and possible physical abuses including fire hazards.

**Roof Insulation and Underlayment: Cellular Glass**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of cellular glass. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

- 2.1 Cellular Glass Block Insulation: ASTM C 552, Type I, rigid, closed cell, noncombustible, foamed

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- glass blocks. Sizes shall be manufacturer's standard sizes and required thickness, edges square.
- 2.2 Cellular Glass Board Insulation: ASTM C 552, Type IV, rigid, closed cell, noncombustible, foamed glass boards, with laminated Kraft paper faces.
    - 2.2.1 Board Sizes: Manufacturer's standard sizes and required thickness with 1/4-inch bevel on long edges at bottom of board.
    - 2.2.2 Tapered Unit Sizes: Manufacturer's standard sizes and taper.
    - 2.2.3 Flame Spread Rating: Insulation shall have maximum flame spread rating of 25 when tested in compliance with ASTM E 84.
  - 2.3 UL Listing: Cellular glass roof insulation and underlayment materials of roofing systems which have been tested for application and slopes and are listed by Underwriters' Laboratories, Inc. (UL) for Class A or Class B external fire exposure shall be provided. Cellular glass roof insulation and underlayment materials shall bear the Classification marking (UL) on bundle, package, or container indicating that materials have been produced under UL's Classification and Follow-Up Service.
  - 2.4 FM Listing: Cellular glass roof insulation and underlayment materials of roofing systems which have been evaluated by Factory Mutual system for fire spread, wind uplift, and hail damage are listed in the "Factory Mutual Approval Guide" for Class 1 construction. Cellular glass roof insulation and underlayment materials bearing FM approval marking on bundle, package, or container indicating that the material has been subjected to FM's examination and follow-up inspection service shall be provided.
  - 3.0 EXECUTION:
    - 3.1 Installation: Place beveled edge of board units to the deck surface in same direction continuously throughout each course.
    - 3.2 Insulation shall be installed to a thickness necessary to provide the designated R-value.

**Roof Insulation and Underlayment: Mineral Fiber**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of mineral fiber. Products shall match existing material and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Insulation board shall be Fed. Spec. HH-I-526, rigid inorganic fiberboard formed with fillers and water-resistant binders.
  - 2.1 Glass Fiberboard: Mineral fiber insulation boards formed of glass fibers shall be bonded together with asphalt and surfaced on top surface with glass-fiber reinforced asphalt mat.
  - 2.2 Mineral Fiberboard: Mineral fiber insulation boards formed of rock or slag processed into fiber shall be bonded together with asphalt and surfaced on top surface with asphalt saturated felt.
  - 2.3 Flame Spread Rating: Insulation shall have maximum flame spread rating of 25 when tested in compliance with ASTM E 84.
  - 2.4 UL Listing: Mineral fiber roof insulation and underlayment materials of roofing systems which have been tested for application and slopes and are listed by Underwriters' Laboratories, Inc. (UL) for Class A or Class B external fire exposure shall be provided. Mineral fiber roof insulation and underlayment materials shall bear the Classification marking (UL) on bundle, package, or container indicating that materials have been produced under UL's Classification and Follow-Up Service.
  - 2.5 FM Listing: Mineral fiber roof insulation and underlayment materials of roofing systems which have been evaluated by Factory Mutual system for fire spread, wind uplift, and hail damage are listed in the "Factory Mutual Approval Guide" for Class 1 construction. Mineral fiber roof insulation and underlayment materials bearing FM approval marking on bundle, package, or container indicating that the material has been subjected to FM's examination and follow-up inspection service shall be provided.
- 3.0 EXECUTION: Install insulation to a thickness necessary to provide the designated R-value.

**Roof Insulation and Underlayment: Composite Board**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of composite board. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product

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manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Composite board insulation shall consist of two insulation boards chemically bonded together. Top board shall be expanded rigid polyurethane foam board complying with Fed. Spec. HH-I-530; top surface shall be surfaced with one layer of asphalt saturated felt or glass fiber mat. Second layer shall be one of the following materials:

2.1.1 Inorganic Perlite Mineral Aggregate Board: ASTM C 728.

2.1.2 Inorganic Glass Fiberboard: Fed. Spec. HH-I-526.

2.1.3 Mineral Fiberboard: Fed. Spec. HH-I-526.

2.2 Flame Spread Rating: Insulation shall have maximum flame spread rating of 25 when tested in compliance with ASTM E 84.

2.3 Edge Sealant: Mastic sealant of type recommended by insulation manufacturer.

2.4 UL Listing: Composite board roof insulation and underlayment materials of roofing systems which have been tested for application and slopes and are listed by Underwriters' Laboratories, Inc. (UL) for Class A or Class B external fire exposure shall be provided. Composite board roof insulation and underlayment materials shall bear the Classification marking (UL) on bundle, package, or container indicating that materials have been produced under UL's Classification and Follow-Up Service.

2.5 FM Listing: Composite board roof insulation and underlayment materials of roofing systems which have been evaluated by Factory Mutual system for fire spread, wind uplift, and hail damage are listed in the "Factory Mutual Approval Guide" for Class 1 construction. Composite board roof insulation and underlayment materials bearing FM approval marking on bundle, package, or container indicating that the material has been subjected to FM's examination and follow-up inspection service shall be provided.

3.0 EXECUTION:

3.1 Installation: Install composite insulation boards with urethane surface up.

3.2 Insulation shall be installed to a thickness necessary to provide the designated R-value.

**Roof Insulation and Underlayment: Expanded Perlite Board**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of expanded perlite board. Products shall match existing material and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 General: Board shall be ASTM C 728, rigid, noncombustible board formed of expanded perlite aggregate and fibers combined with water-resistant mineral binders. Boards shall have integral top surface coating of insulation manufacturer's standard type.

2.2 Flame spread rating: insulation shall have maximum flame spread rating of 25 when tested in compliance with ASTM E 84.

2.3 UL Listing: Expanded perlite board roof insulation and underlayment materials of roofing systems which have been tested for application and slopes and are listed by Underwriters' Laboratories, Inc. (UL) for Class A or Class B external fire exposure shall be provided. Expanded perlite board roof insulation and underlayment materials shall bear the Classification marking (UL) on bundle, package, or container indicating that materials have been produced under UL's Classification and Follow-Up Service.

2.4 FM Listing: Expanded perlite board roof insulation and underlayment materials of roofing systems which have been evaluated by Factory Mutual System for fire spread, wind uplift, and hail damage are listed in the "Factory Mutual Approval Guide" for Class 1 construction. Expanded perlite board roof insulation and underlayment materials bearing FM approval marking on bundle, package, or container indicating that the material has been subjected to FM's examination and follow-up inspection service shall be provided.

3.0 EXECUTION:

3.1 Insulation board shall be covered with wood board walkways where transport of materials will

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result in damage to the insulation. Remove walkways ahead of roofing operations.

- 3.2 Insulation shall be installed to a thickness necessary to provide the designated R-value.

**Roof Insulation and Underlayment: Fiberboard**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of fiberboard. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 General: ASTM C 208, Rigid, organic fiberboard derived from wood, cane, or other vegetable fibers, formed with fillers and water-resistant binders.
  - 2.2 Asphalt Impregnation: Insulation board shall be impregnated with asphalt, applied at rate not to exceed 4 percent by weight.
  - 2.3 Bituminous Coating: Insulation board shall be surfaced with manufacturer's standard bituminous coating.
  - 2.4 Flame Spread Rating: Insulation shall have maximum flame spread rating of 25 when tested in compliance with ASTM E 84.
  - 2.5 UL Listing: Fiberboard roof insulation and underlayment materials of roofing systems that have been tested for application and slopes and are listed by Underwriters' Laboratories, Inc. (UL) for Class A or Class B external fire exposure shall be provided. Fiberboard board roof insulation and underlayment materials shall bear the Classification marking (UL) on bundle, package, or container indicating that materials have been produced under UL's Classification and Follow-Up Service.
  - 2.6 FM Listing: Fiberboard roof insulation and underlayment materials of roofing systems that have been evaluated by Factory Mutual system for fire spread, wind uplift, and hail damage are listed in the "Factory Mutual Approval Guide" for Class 1 construction. Fiberboard board roof insulation and underlayment materials bearing FM approval marking on bundle, package, or container indicating that the material has been subjected to FM's examination and follow-up inspection service shall be provided.
- 3.0 EXECUTION: Install insulation to a thickness necessary to provide the designated R-value.

**Sprayed-on Fireproofing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of sprayed-on fireproofing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Products shall be provided that have been tested in accordance with ASTM E 119, UL 263, ANSI A2.1, or NFPA 251 for fire-resistance and rated by UL or other industry-recognized agency for the required resistances.
  - 2.1 Spray-applied Fireproofing: Materials shall conform to the requirements of ASTM E 1042, Type I, Category A. Spray-applied fireproofing materials shall not contain asbestos.
    - 2.1.1 Water shall be clean, fresh, potable, and free from amounts of oils, acids, alkalis, and organic matter that would be injurious to the fireproofing.
  - 2.2 Performance Requirements: Spray-applied fireproofing material shall conform to the following requirements:
    - 2.2.1 Deflection: Spray-applied fireproofing shall not crack, spall, or delaminate when tested in accordance with ASTM E 759.
    - 2.2.2 Cohesion/adhesion: spray-applied fireproofing material shall have a minimum cohesive/adhesive force of 80 psf when tested in accordance with ASTM E 736.
    - 2.2.3 Bond-impact: spray-applied fireproofing material shall not crack, spall, or delaminate when tested in accordance with ASTM E 760.
    - 2.2.4 Compressive Strength: The minimum compressive strength shall be 500 psf based upon the average load of 10 percent deformation or at ultimate load, whichever is less as tested in accordance with ASTM E 761.
    - 2.2.5 Air Erosion: Gain in weight of the collecting filter shall not exceed 0.025 gram per square foot when

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- tested in accordance with ASTM E 859.
- 2.2.6 Corrosion Resistance: No evidence of corrosion, after testing in accordance with ASTM E 937, for metal surfaces to be covered.
  - 2.3 Fire Hazard Classification:
    - 2.3.1 Surface Burning Characteristics: Spray-applied fire-proofing material shall have a flame spread of 25 or less, a smoke developed rating of 50 or less, and a fuel contributed rating of 50 or less when tested in accordance with ASTM E 84.
  - 2.4 Fire resistance rating for building elements shall be as indicated and shall conform to the fire rated assemblies as listed in the UL Fire Resistance Directory.
  - 2.5 Substrate Primers: Provide type that is compatible with condition of each substrate to be fireproofed, including shop primers applied by metal fabricators/erectors, and is compatible with bonding adhesives and fireproofing materials.
  - 2.6 Metal Lath: Except as otherwise indicated, provide 3.4-pound (per sq yd) expanded galvanized diamond steel lath, with reinforcing members and clips and other anchorage devices as appropriate for substrate and complying with selection requirements of applicable fire endurance tests. Provide corner beads and other lathing accessories of standard design and weight, where required.
  - 3.0 EXECUTION:
    - 3.1 Surface Preparation: Surfaces to be fireproofed shall be thoroughly cleaned of all dirt, grease, oil, paint, rust, and mill scale or other contaminants that will interfere with the proper bonding of the sprayed fireproofing to the substrate. Ceiling areas to be fireproofed shall be cleared of all obstructions interfering with the uniform application of the spray-applied fireproofing. Hardware such as support sleeves, inserts, clips, hanger attachment devices and the like shall be installed prior to the application of the fireproofing.
    - 3.2 Surface Acceptability: Surfaces to receive sprayed fireproofing shall be inspected prior to application of fireproofing material and certified to be clean and in acceptable condition for application of spray-applied fireproofing.
    - 3.3 Application: Prior to spray application, surfaces not to receive spray-applied fireproofing, including instruments, gauges, and equipment shall be covered to prevent contamination by splatter, rebound, and overspray. Exterior openings in areas to receive spray-applied fireproofing shall be covered prior to and during application of fireproofing with tarpaulins or other approved material. Fireproofing material shall be applied to a thickness as required to obtain the specified fire resistance rating and to provide a fire-protective coating of uniform density and texture. Fireproofing shall be applied in accordance with the procedure recommended by the manufacturer. Fireproofing applied to underside of steel roof deck or steel floor assemblies shall be installed only after respective roof or floor construction is complete. No roof or floor traffic shall be allowed during application and during curing period. Sealer shall be applied to clean, dry fireproofed surfaces in accordance with manufacturer's recommendations.
    - 3.4 Cleanup: Surfaces not indicated to receive fireproofing shall be thoroughly cleaned of all sprayed material.

**Asphalt Shingles**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of asphalt shingles. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Nails shall be nonferrous metal or zinc-coated steel long enough to penetrate at least 3/4 inch into the deck sheathing.
  - 2.2 Roll Roofing:
    - 2.2.1 Smooth Surfaced: ASTM D 224, Type II.
    - 2.2.2 Mineral Surfaced: Fed. Spec. SS-R-630 and provided with 2-inch selvage.
  - 2.3 Shingles shall meet requirements of Underwriters' Laboratories, Inc., for Class C wind-resistant shingles by equaling or exceeding the requirements of UL 55A and UL 997. Shingles shall be square-butt strips of uniform

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- thickness or of thick-butt style, 12 by 36 inches, and either 2-tab or 3-tab design.
- 2.4 UL Listing: Asphalt and composition shingle materials of roofing systems which have been tested for application and slopes and are listed by Underwriters' Laboratories, Inc. (UL) for Class A or Class B external fire exposure shall be provided. Asphalt shingle materials shall bear the Classification marking (UL) on bundle, package, or container indicating that materials have been produced under UL's Classification and Follow-Up Service.
  - 2.5 FM Listing: Asphalt shingle materials of roofing systems which have been evaluated by Factory Mutual system for fire spread, wind uplift, and hail damage are listed in the "Factory Mutual Approval Guide" for Class 1 construction. Asphalt shingle materials bearing FM's examination and follow-up inspection service shall be provided.
  - 3.0 EXECUTION:
    - 3.1 Preparation: Loose, curled, broken, or lifted asphalt shingles shall be nailed down or replaced, if required, to provide a solid nailing base. Protruding or loose nails shall be removed or nailed down.
    - 3.2 Installation:
      - 3.2.1 Application of Roofing When Existing Roofing is Removed:
        - 3.2.1.1 Underlayment: Apply one layer of 15-pound asphalt-saturated felt to roof-deck sheathing.
        - 3.2.1.2 Underlayment: Apply two layers of 15-pound asphalt-saturated felt applied to roof-deck sheathing. A solid coating of bituminous cement shall be applied between the layers of underlayment.
        - 3.2.1.3 Shingles: Apply shingles over underlayment allowing 5-inch butt exposure, and in no case shall there be less than 2-inch head lap.
        - 3.2.1.4 Hips and Ridges shall be formed with 9- by 12-inch individual shingles.
        - 3.2.1.5 Valleys:
          - 3.2.1.5.1 Closed woven-shingle valleys shall have a single layer lining of smooth-surfaced or mineral-surfaced roll roofing, 36 inches wide.
          - 3.2.1.5.2 Roll roofing valley shall be two thicknesses of mineral-surfaced roll roofing.
      - 3.2.2 Application of Roofing Over Existing Asphalt Shingles: Shingles shall be applied over old shingles with butt exposure, except for starter course, equal to old shingles, and in no case shall there be less than 2-inch head lap.
      - 3.2.3 Roof Patching and Replacement: Match existing shingles in design, weight, texture, pattern, and color.

**Slate Shingles**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of slate shingles. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Nails shall be large head slater's nails, either hard copper wire nails, cut copper, cut brass, or yellow metal and shall be long enough to penetrate at least 1 inch into the deck sheathing.
  - 2.2 Slate shingles shall comply with ASTM C 406 and shall be of matching or designated size, thickness, color, and texture.
  - 2.3 Asphalt-saturated organic felt shall comply with ASTM D 226.
- 3.0 EXECUTION:
  - 3.1 Underlayment: Apply one layer of 30-pound asphalt-saturated felt to roof-deck sheathing.
  - 3.2 Slating:
    - 3.2.1 Starter Course: Apply starter course at eave on cornice line with same thickness slate as main roofing material. Slate shall be approximately 3 inches longer than exposure of first course and shall be installed over a 1/4-inch thick treated wood cant.
    - 3.2.2 First and Succeeding Courses: Apply slate over underlayment with 6-1/2 inch butt exposure with minimum 3-inch head lap. Slate shall project 1 inch at eaves and 1/2 inch at gable ends. Each course shall break joints with preceding course by minimum 3 inches.
    - 3.2.3 Nailing: Fasten each slate with two nails. Do not drive far enough to produce a strain on the slate. Exposed nails shall be permissible only in top courses where unavoidable, and exposed nail heads

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shall be covered with bituminous cement.

**Clay Roofing Tiles**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of clay roofing tiles. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Mortar: Mixture of Portland cement, sand, and pigment.
  - 2.2 Nails: Copper or noncorrosive metal.
    - 2.2.1 Ring Type Nails: Used on plywood sheathing.
    - 2.2.2 Slater's Nails: Minimum of 1-1/2 inches long and shall be used on board sheathing.
  - 2.3 Asphalt-saturated organic felt shall comply with ASTM D 226.
  - 2.4 Roofing tiles shall be a clay or shale product that is burned to a hard dense structure, glazed or nonglazed on exposed surfaces.
- 3.0 EXECUTION:
  - 3.1 Underlayment: Apply one layer of 30-pound asphalt-saturated felt to roof-deck sheathing.
  - 3.2 Application of Slab Shingle Tiles: Install a 3/4-inch by 1-inch cant strip along eave. On top of cant install under-eave tiles, projecting 1 inch over the rear edge of gutter and flush with the gable edge. Install first course of roofing tiles flush with butt edge of under-eave tile and extend 2 inches over the gable ends. Lay field tiles in straight courses with 2-inch head lap and secure with roofing nails in all holes provided in tiles. Lay all tiles within one foot of hips, ridges, and abutting vertical surfaces in bituminous cement.
  - 3.3 Application of Interlocking Tiles: Install cant strip or under-eave fittings as required by tile configuration. On top of cant or under-eave fitting, install first course of roofing tiles projecting 1 inch over rear edge of gutter. Lay roof tiles with straight butt lines, interlocked into adjoining tiles with a 3-inch headlap and secure with nails in all holes provided in tiles. Provide gable rake fittings at all gables.
  - 3.4 Application of Spanish and Mission Tiles: Install cant strip over eave closure fittings and nailing strips as required by configuration of tiles. Set eave closures back 2 inches from lower edge of eave. Lay tiles in straight vertical lines up roof and with uniform exposure to weather. Give all tiles minimum lap of 3 inches, and extend eave tiles 1 inch over edge of gutters. Fit all tiles properly and secure with nails in all holes provided. Nails shall be long enough to penetrate at least 1 inch into wood base. Cement and nail cover tiles to gable rakes with bituminous cement, all the way up the gables. When eave closures and top fixtures are not required, cement eaves and joint at ridge with mortar.
  - 3.5 Replacing Individual Spanish or Mission Roofing Tiles: Remove broken tiles by cutting nails with a ripper. Insert new tiles of the same color and size as broken one by troweling Portland cement mortar on new tile surface that will be lapped by tile in course above and on surface that will lap tile in course below. Fasten new tile in place with metal strap or wire.

**Concrete Roofing Tiles**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of concrete roofing tiles. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Mortar: Mixture of Portland cement, sand, and pigment.
  - 2.2 Nails: Copper or noncorrosive metal.
    - 2.2.1 Ring Type Nails: Used on plywood sheathing.
    - 2.2.2 Slater's Nails: Used on board sheathing.
  - 2.3 Roofing Tiles: Waterproof concrete product reinforced with steel wire. Each tile shall be manufactured with nail holes. Standard rake, closures, hip, and ridge fittings same color as tile,

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shall be provided.

- 2.4 Asphalt-saturated organic felt shall comply with ASTM D 226.
- 3.0 EXECUTION:
- 3.1 Underlayment: Apply one layer of 30-pound asphalt-saturated felt to roof-deck sheathing.
- 3.2 Application of Slab Shingle Tiles: Apply 1-inch by 1/2-inch cant strip 1/2 inch from edge of eave. On top of cant, install a starter strip of tiles projecting 1 inch over rear edge of gutters and 1 inch beyond gable ends. Install the first course of tiles flush with edges of starter strip. Lay field tiles in straight courses with a 2-inch head lap and secure with two large-head roofing nails. Lay all tiles within 1 foot of hips, ridges, and abutting vertical surfaces in bituminous cement.
- 3.3 Application of Interlocking Tiles: Install cant strip or under-eave fittings as required by tile configuration. On top of cant, or under-eave fitting, install first course of roof tile projecting 1 inch over the rear edge of gutter. Lay roof tiles with straight butt lines interlocked into adjoining tiles with a 3-inch headlap and secure with nails in all holes provided in the tiles. Provide gable rake fittings at all gables.

**Preformed Roofing and Siding**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of preformed roofing and siding panels. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Aluminum Roof Panels: Fabricated from roll-formed panels of aluminum alloy in accordance with ASTM B 209, tempered as required for forming operation, with a minimum thickness of 0.032 inch. Thickness of panels shall be the standard thickness as required for roofing span and design loading.
  - 2.1.1 Color-Coated Finish. One of the following standard factory-applied, baked-on coatings:
    - 2.1.1.1 Acrylic Enamel Coating: Epoxy primer and acrylic enamel top coat, dry film thickness not less than 0.2 mil for primer and 0.8 mil for topcoat.
    - 2.1.1.2 Fluoropolymer Coating: Full strength 70 percent polyvinylidene fluoride finish, dry film thickness not less than 1.0 mil over a minimum 0.2 mil baked-on modified epoxy primer.
    - 2.1.1.3 Siliconized Polyester Coating: Epoxy primer and silicone-modified polyester enamel topcoat, dry film thickness not less than 0.2 mil for primer and 0.8 mil for topcoat.
  - 2.1.2 Factory Prime Coating: Factory-applied baked-on epoxy primer coat, not less than 0.2 mil dry film thickness applied after pretreatment.
  - 2.1.3 Natural Finish: Stucco embossed finish, plain mill-finished or special alloy-clad sheet (Alclad), as required.
  - 2.1.4 Corrugated panels shall be standard 7/8 inch deep with corrugation crests at 2.67 inches on centers with either interlocking ribs or overlapping side laps at side joints, as required.
  - 2.1.5 V-Beam panels shall be standard V-shaped ribbed panels, nominally 4-7/8 inches on centers and 1-3/4 inches deep with either interlocking ribs or overlapping side laps at side joints, as required.
- 2.2 Steel roof panels shall be factory-painted steel metal panels which shall be zinc-coated steel conforming to ASTM A 446, Grade A, G90 zinc coating designation. Roof covering shall be 22 galvanized sheet gauge or thicker. Steel roof panels shall be factory prime-coated and color-coated with one of the color coatings specified for aluminum roof panels.
  - 2.2.1 Corrugated panels shall have similar dimensional and side joint characteristics as specified for aluminum roof panels.
  - 2.2.2 Box rib panels shall be standard units, approximately 1-1/2 inches deep with 1-3/8 inch wide flutes and 5 box ribs at 7-13/64 inches on centers for a 36-inch wide coverage.
  - 2.2.3 Four-inch ribbed panels shall be standard units approximately 1 inch deep with 9 box ribs at 4 inches on centers for a panel width of 37-1/2 inches.
- 2.3 Standing Seam Roofing:
  - 2.3.1 General: Roof-covering panels shall be fabricated of zinc-coated steel conforming to ASTM A 446, G90 coating designation or aluminum-coated steel conforming to ASTM A 463, Type 2. Roof

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- covering shall be 24 galvanized sheet gauge or thicker. Panels shall have configurations designed for mechanically formed lock seams for securing adjacent sheets. Sealant for standing seams shall be factory-applied. Width of sheets shall provide not less than 12 inches of coverage in place. Height of standing seam shall be not less than 2-1/2 inches for slopes less than 3 inches in 12 inches, and not less than 1-3/4 inches for slopes 3 inches in 12 inches or greater.
- 2.3.2 Color Coating: Color finish shall consist of either a synthetic resin base coating applied to a pretreated and primed surface or a dry film coating material bonded to the metal substrate with adhesive. Dry film thickness of color coat shall be not less than 0.8 mil for exterior surface finish.
- 2.3.3 Accessories shall include flashing, trim, cps, and similar accessories of not less than the minimum thicknesses specified for roofing. Accessories of zinc-coated steel used with aluminum-coated steel shall be painted. Molded closure strips shall be closed-cell or solid-cell synthetic rubber, neoprene, or polyvinyl chloride premolded to match configuration of the covering.
- 2.3.4 Panel clips shall be of two-piece construction with movable tabs. Clips shall provide for at least 2 inches of panel movement. Tabs shall be designed to be folded into the lock seam.
- 2.3.5 Fasteners shall be zinc-coated steel or corrosion-resisting steel.
- 2.3.5.1 Screws shall be not less than No. 14 diameter if self-tapping type and not less than No. 12 diameter if self-drilling and self-tapping type.
- 2.3.5.2 Blind rivets shall be stainless steel.
- 2.3.5.3 Bolts shall be not less than 1/4-inch diameter, shouldered or plain shank, as required, with proper nuts.
- 2.4 Aluminized Steel Roof Panels:
- 2.4.1 General: Roof panels shall be formed of Type II aluminized sheet in accordance with ASTM A 463. Thickness shall be not less than 22-gauge material.
- 2.4.2 Aluminized steel corrugated panels shall be similar to standard profiles and dimensional and side joint characteristics as specified for aluminum roof panels and steel roof panels.
- 2.5 Plastic Roof Panels:
- 2.5.1 General: Preformed translucent plastic roof panels shall be glass fiber-reinforced polyester plastic panels conforming to ASTM D 3841.
- 2.5.2 Non-fire rated translucent plastic roof panels shall be manufactured of acrylic modified resins with either a smooth or embossed finish. Glass reinforcement shall be not less than 27 percent by weight and resins approximately 73 percent by weight and shall be of high quality light-stabilized polyester, modified with acrylic monomer.
- 2.5.3 Low flame spread translucent plastic roof panels shall be manufactured of light-stabilized, fire-retardant polyester approximately 75 percent by weight and modified with acrylic monomer. Glass reinforcement shall be not less than 25 percent by weight. Panels shall be classified by Underwriters' Laboratory with a flame spread of not greater than 25 when tested in accordance with ASTM E 84. Finish shall be smooth or embossed as required.
- 2.5.4 Corrosion-resistant opaque panels shall be manufactured of resins composed of high quality light-stabilized polyester, modified with acrylic monomer. Where required, panels shall be the fire-retardant type classified by Underwriters' Laboratories, with a flame spread not greater than 25 when tested in accordance with ASTM E 84.
- 2.5.5 High strength opaque fire-retardant panels suitable for walkable roof service shall be composed of high quality light-stabilized, fire-retardant polyester, modified with acrylic monomer. Glass reinforcement shall be a minimum of 38 percent, composed of woven continuous strand and chopped strand glass. Interior and exterior surfaces shall have a surface veil. Finish shall be embossed. All panels shall be classified by Underwriters' Laboratories, with a flame spread not greater than 25 when tested in accordance with ASTM E 84.
- 2.6 Aluminum Siding Panels: Aluminum siding panels shall be similar to aluminum roofing panels. Four-inch ribbed panels shall be approximately 1 inch deep with 9 box ribs at 4 inches on centers for a panel width of 37-1/2 inches.
- 2.7 Steel Siding Panels shall be similar to steel roofing panels, including finish and profiles (except box rib profile). Thickness shall be 24 galvanized sheet gauge or thicker.
- 2.8 Insulated Siding Panels:
- 2.8.1 Factory-assembled Sandwich Panels:

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- 2.8.1.1 General: Interior and exterior panels shall be shop-assembled, fabricated of hot-dipped, zinc-coated, roll-formed steel sheet, ASTM A 446, Grade A, except where higher strength is required for performance, and G90 zinc coating. Thickness of interior and exterior panels shall be determined for wall spans and design loading as required.
- 2.8.1.2 Insulation shall be standard glass fiber blanket insulation complying with ASTM C 665, Type I, with a k-value of 0.27 at 75 F and a density of not less than 1.5 lbs/cu ft.
- 2.8.1.3 Assembled panel system shall have standard continuous gasket at male legs isolating metal-to-metal contact. Panels shall be factory-caulked.
- 2.8.1.4 All related closures, flashings, and copings shall be manufactured from same gauge material as exterior face metal panel and shall be properly engineered to job conditions.
- 2.8.1.5 Finish of exterior panels shall be factory prime-coated and color-coated with one of the color coatings specified for aluminum panels. Finish of interior panels shall be prime coat with a color coat as required.
- 2.8.2 Field-Assembled Sandwich Panels:
  - 2.8.2.1 Interior wall facing units shall be hot-dipped, zinc-coated, single rib design steel sheet, ASTM A 446, Grade A, G90 zinc coating. Interior wall facing units may be of 0.024 inch or thicker aluminum. Interior units shall be roll-formed in unit widths of 12 inches with 1-1/2 inch ribs or 24 inches with 2-inch ribs. Interlocking joints shall be provided between units. Interior wall units shall present a flush inside wall surface.
  - 2.8.2.2 Insulation: Rigid or semi-rigid board insulation shall conform to Fed. Spec. HH-I-558, Form A, Class 1 or 2. Blanket insulation shall conform to Fed. Spec. HH-I-558, Form B, Type I, Class 6. Insulation shall have a flame spread not in excess of 25 and a smoke developed rating not in excess of 50 when tested in accordance with ASTM E 84. Insulation shall be of sufficient thickness to provide the designated U-value.
  - 2.8.2.3 Exterior panel materials shall be mill-embossed finished aluminum, galvanized steel, galvanized and painted steel, or stainless steel.
    - 2.8.2.3.1 Aluminum Sheets shall be ASTM B 209. Where required, stucco embossed finish shall be provided. Where required, provide Alclad aluminum alloy-clad sheets where exposed without applied coatings.
    - 2.8.2.3.2 Steel panels shall be metal panels of zinc-coated steel conforming to ASTM A 446, Grade A, G90 zinc coating. Where color coating is required, finish shall be factory prime-coated and color-coated with one of the color coatings specified for aluminum roof panels.
    - 2.8.2.3.3 Stainless steel panels shall be fabricated from ASTM A 167, sheet stock types 302 or 304 stainless steel with No. 2B surface finish. Where exposure to corrosive atmospheres or coastal areas is required, stainless steel panels shall be fabricated from ASTM 167, sheet stock type 316, with No. 2B surface finish.
- 2.9 Solid vinyl siding shall comply with ASTM D 3679, Class 2.
- 3.0 EXECUTION:
  - 3.1 General: Installation shall include all standard fasteners, flashings, sealants, gaskets, closure strips, trim, and insulation associated with roofing and siding. Provide expansion joints where required.
  - 3.2 Field-Assembled Sandwich Panel Siding shall include installation of subgirts. All panels shall be erected with flutes and ribs running vertically.
  - 3.3 Factory-assembled sandwich panels shall be erected by means of standard concealed clip attachments.
  - 3.4 Solid vinyl siding shall include all accessories required for a complete installation.

**Asbestos Cement Roofing and Siding**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of asbestos cement roofing and siding. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:

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- 2.1 Wall Covering and Roof Covering: Corrugated asbestos cement panels shall conform to ASTM C 221, Type A, natural gray color.
- 2.2 Accessories: Accessories of asbestos cement used as supplementary or finishing pieces shall conform to ASTM C 221. Molded closure strips shall be bituminous saturated fiber, closed-cell or solid-cell synthetic rubber or neoprene, or polyvinyl chloride premolded to match the configuration of the covering.
- 2.3 Fasteners: Fasteners exposed to weather shall be gasketed or have gasketed washers to weatherproof the penetration. Gaskets shall be neoprene, other elastomeric material, or lead approximately 1/8 inch thick. Bolts and drive screws shall be zinc-plated steel. Self-tapping screws shall be cadmium-coated or 300 series corrosion-resisting steel. Bolt clips shall be galvanized steel of standard design appropriate for the application.
- 2.4 Insulation Materials: Insulation shall be of sufficient thickness to provide the designated roof and wall U-values through the completed construction, when determined for winter conditions in accordance with recognized methods in agreement with the ASHRAE Handbook & Product Directory, Fundamentals. Insulation shall have a facing providing a permeability as required when tested in accordance with ASTM E 96. Facing shall be either of reinforced foil with a vinyl finish or sheet vinyl, except unreinforced foil may be used in concealed locations. Facings and finishes shall be factory-applied. Insulation, including facings and finishes, shall have a flame spread not in excess of 25 and a smoke developed rating not in excess of 50 when tested in accordance with ASTM E 84.
  - 2.4.1 Rigid or semi-rigid board insulation shall conform to Fed. Spec. HH-I-558, Form A, Class 1 or Class 2. Exposed insulation shall have a white non-dusting and non-shedding finish.
  - 2.4.2 Blanket insulation shall conform to Fed. Spec. HH-I-558, Form B, Type I, Class 6.
- 2.5 Insulation Retainers: Insulation retainers shall be type, size, and design necessary to hold the insulation adequately. Metallic retaining members shall be nonferrous or have a nonferrous coating. Nonmetallic retaining members, including adhesives used in conjunction with mechanical retainers or at insulation seams, shall have a fire resistance classification not less than that permitted for the insulation.
- 2.6 Wall Liners: Wall liners shall be 0.024-inch or thicker aluminum or 26 galvanized sheet gauge or thicker steel. Wall liners shall be formed or patterned to prevent waviness and distortion and shall extend from the floor to height as required. Matching metal trim shall be provided at the base of wall lining, top of wall liner, around openings in walls and roof and over interior and exterior corners.
  - 2.6.1 Steel wall liners shall be zinc-coated steel conforming to ASTM A 446, G 90 coating designation, or aluminum-coated steel conforming to ASTM A 463, Type 2.
  - 2.6.2 Aluminum wall liners shall conform to ASTM B 209, temper as required for the forming operation.
  - 2.6.3 Sealant shall be as recommended by the roofing and siding manufacturer.
- 3.0 EXECUTION:
  - 3.1 Wall Covering and Roof Covering: Sheets shall be laid the straight or staggered joint method as required. Wall covering shall be applied with edge corrugations turned in and the longitudinal configurations in the vertical position. Roof covering shall be applied with the edge corrugations turned down and the longitudinal configurations in the direction of the roof slope. End laps shall be made over framing members with fasteners into framing members approximately 3 inches from the end of the overlapping sheet. Side laps and end laps of roof and wall covering and joints at accessories shall be sealed. Holes for fasteners shall be drilled only in the high part of the corrugation. Fasteners shall be driven normal to the surface and to a depth to seat the gasketed washers properly without overdriving and cracking the crests. Automatic end-welded studs shall not be used for applying wall and roof sheets. Cutting of sheets shall be accomplished with a saw equipped with a vacuum or a water jet and in accordance with OSHA 1910.1001 and 1926.103.
  - 3.2 Molded closure strips shall be installed wherever covering sheets terminate in open-end configurations, exclusive of flashings.
  - 3.3 Insulation shall be installed between covering and supporting members. Blanket insulation shall have facing at joints lapped and fastened in a manner that will provide tight joints. Exposed rigid or semi-rigid insulation in ceilings shall be fastened securely without loose joints and unsightly sags.

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Insulation retainers shall be fastened securely in place.

- 3.4 Wall Liners: Additional framing and accessories shall be provided as necessary for the installation of the wall liners.

**Built-up Roofing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of built-up roofing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Primer: Asphalt, ASTM D 41; coal-tar, ASTM D 43.
- 2.2 Bitumen:
- 2.2.1 Asphalt: ASTM D 312, Type I on slopes from 1/4 inch per foot up to and including 1/2 inch per foot, Type II or Type III on slopes above 1/2 inch per foot up to and including 1 inch per foot, Type III on slopes above 1 inch per foot and including 3 inches per foot.
- 2.2.2 Coal-Tar Bitumen for slopes from 1/4 inch per foot up to and including 1/2 inch per foot: ASTM D 450, Type III, unless Type I is approved by the Authorized Member Representative.
- 2.2.3 Cold-Process Asphalt Emulsion: A mechanical mixture of minute particles of asphalt and special clays suspended in water.
- 2.3 Cants: Treated fiberboard, ASTM C 208; wood blocking treated with waterborne preservative, AWPB LP-2; or foamglass. Cants shall have maximum 5-1/2 inch face dimensions at a 45 degree incline to roof plane and lengths as long as practical.
- 2.4 Felt:
- 2.4.1 Organic-Fiber Felt:
- 2.4.1.1 Plies: ASTM D 226, Type I, asphalt-saturated; or ASTM D 227, Type I, coal-tar saturated.
- 2.4.1.2 Asphalt-Saturated Base Sheet: No. 40 felt, ASTM D 2626, Type I or II.
- 2.4.2 Glass-Fiber Felt:
- 2.4.2.1 Plies: ASTM D 2178, Type III or IV where average January temperature is above 40 F and Type IV where average January temperature is below 45 F.
- 2.4.2.2 Asphalt-Impregnated Combination Base Sheet: ASTM D 2178, Type V.
- 2.4.3 Venting Base Sheet: Asphalt-saturated and coated base sheet with granular surfacing and embossed channels (or grooves) on bottom surface.
- 2.4.4 Cold-Process System Felts: Coated organic, glass-fiber, or a combination of both.
- 2.5 Flashings: Bituminous and sheet metal as required.
- 2.6 Flashing Cement: Bituminous plastic cement complying with Fed. Spec. SS-C-153, Type I for use with asphalt-saturated felts and Type II for use with coal-tar saturated felts.
- 2.7 Cold-Process Cement: Solvent-based cement that evaporates slowly in cool damp weather, more rapidly in hot dry weather, and is standard with the cold-process glass-fiber reinforced asphalt emulsion roofing system manufacturer.
- 2.8 Mastic: Solvent-based mastic that evaporates slowly in cool damp weather, more rapidly in hot dry weather, and is standard with the cold-process mastic roofing system manufacturer.
- 2.9 Nails and Mechanical Fasteners: Industry standard, noncorrosive material, shape and size required for substrate.
- 2.10 Surfacing Materials:
- 2.10.1 Aggregate: Crushed stone, gravel, or crushed slag conforming to ASTM D 1863. Subject to approval, other materials may be used when blended to the grading requirements of ASTM D 1863.
- 2.10.2 Smooth Surfacing:
- 2.10.2.1 Fibrated, clay-stabilized, water thinned asphalt emulsion with non-asbestos reinforcing, ASTM D 1227, Type IV (clay-type).
- 2.10.2.2 Reflective Coating: ASTM D 2824, Type I if non-fibrated, Type II if fibrated.
- 2.10.3 Mineral Surfacing: Mineral surface cap sheet complying with ASTM D 3909.
- 2.11 Sheathing Paper: ASTM D 549, 5-pound rosin-sized paper.
- 2.12 Wood Nailers and Edge Blocking: Non-stress graded wood members, treated with waterborne

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- preservative in compliance with AWFb LP-2.
- 2.13 Walkway Protection Boards: Mineral surfaced bituminous composition boards, approximately 1/2 inch thick, manufactured specifically for hot bituminous application on built-up roofing as a protection course for foot traffic.
- 2.14 Roofing Systems:
- 2.14.1 Nailable Deck, Asphalt/Organic Felt Membrane With Aggregate Surfacing: NRCA Specification Plate No. 31-NAOA, Diagram B for light-weight insulating concrete decks and Diagram A for other nailable decks.
- 2.14.2 Nailable Deck, Asphalt/Glass-Fiber Felt Membrane:
- 2.14.2.1 With Aggregate Surfacing: NRCA Specification Plate No. 32-NAGA, Diagram B for lightweight insulating concrete decks and Diagram A for other nailable decks.
- 2.14.2.2 With Smooth Surfacing: NRCA Specification Plate No. 32-NAGA except for substitution of smooth surfacing for aggregate surfacing.
- 2.14.2.3 With Mineral Surfacing: NRCA Specification Plate No. 32-NAGA except for deletion of one ply of felt and substitution of mineral surfacing for aggregate surfacing.
- 2.14.3 Nailable Deck, Coal-Tar/Organic Felt Membrane with Aggregate Surfacing: NRCA Specification Plate No. 33-NCOA, Diagram B for light-weight insulating concrete decks and Diagram A for other nailable decks.
- 2.14.4 Insulated Deck, Asphalt/Organic Felt Membrane with Aggregate Surfacing: NRCA Specification Plate No. 41-IAOA; Diagram B for insulation substrate of composite board, polyisocyanurate foam board, or polyurethane foam board; Diagram A for other insulation substrates.
- 2.14.5 Insulated Deck, Asphalt/Glass-Fiber Felt Membrane:
- 2.14.5.1 With Aggregate Surfacing: NRCA Specification Plate No. 42-IAGA; Diagram B for insulation substrate of composite board, poly-isocyanurate foam board, or polyurethane foam board; Diagram A for other insulation substrates.
- 2.14.5.2 With Smooth Surfacing: NRCA Specification Plate No. 42-IAGA except for addition of one ply of felt and substitution of smooth surfacing for aggregate surfacing.
- 2.14.5.3 With Mineral Surfacing: NRCA Specification Plate No. 42-IAGA except for substitution of mineral surfacing for aggregate surfacing.
- 2.14.6 Insulated Deck, Coal-Tar/Organic Felt Membrane with Aggregate Surfacing: NRCA Specification Plate No. 43-ICOA; Diagram B for insulation substrate of composite board, polyisocyanurate foam board, or polyurethane foam board; Diagram A for other insulation substrates.
- 2.14.7 Concrete Deck, Asphalt/Organic Felt Membrane with Aggregate Surfacing: NRCA Specification Plate No. 51-CAOA, Diagram A or B as directed.
- 2.14.8 Concrete Deck, Asphalt/Glass-Fiber Felt Membrane:
- 2.14.8.1 With Aggregate Surfacing: NRCA Specification Plate No. 52-CAGA, Diagram A or B as directed.
- 2.14.8.2 With Smooth Surfacing: NRCA Specification Plate No. 52-CAGA except for addition of one ply of felt and substitution of smooth surfacing for aggregate surfacing.
- 2.14.8.3 With Mineral Surfacing: NRCA Specification Plate No. 52-CAGA except for substitution of mineral surfacing for aggregate surfacing.
- 2.14.9 Concrete Deck, Coal-Tar/Organic Felt Membrane with Aggregate Surfacing: NRCA Specification Plate No. 53-CCOA; Diagram A or B as directed.
- 2.14.10 Temporary Roofing: NRCA Specification 10-TR; Diagram TR-N for nailable decks, Diagram TR-C for non-nailable decks (except steel) and Diagram TR-SI for steel decks.
- 2.14.11 Cold-Process Built-Up Membrane Roofing:
- 2.14.11.1 Glass-Fiber Reinforced Asphalt Emulsion System: Minimum two layers of coated ply felts with smooth surfacing (asphalt emulsion).
- 2.14.11.2 Mastic System: Coated ply felts (three plies on slopes less than 1 inch per foot and two plies on slopes greater than 1 inch per foot) embedded into a spray application of mastic with embedded mineral granule surfacing.
- 2.15 UL Listing: Built-up roofing systems and component materials of roofing systems that have been tested for application and slopes and are listed by Underwriters' Laboratories, Inc. (UL) for Class A or Class B external fire exposure shall be provided. Roof covering materials shall bear the Classification marking (UL) on bundle, package, or container indicating that materials have been

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produced under UL's Classification and Follow-Up Service.

- 2.16 FM Listing: Built-up roofing systems and component materials of roofing systems that have been evaluated by Factory Mutual system for fire spread, wind uplift, and hail damage are listed in the "Factory Mutual Approval Guide" for Class 1 construction. Built-up roofing systems and component materials bearing FM approval marking on bundle, package, or container indicating that the material has been subjected to FM's examination and follow-up inspection service shall be provided.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Mineral Surfaced Cap Sheet: Cut sheet in 12- to 18-foot lengths and leave to flatten prior to application.
    - 3.1.2 Temporary Roofing: Remove temporary roofing completely prior to installation of permanent roofing.
    - 3.1.3 Weather Limitations: Do not apply roofing when it is excessively windy, wet, or when the ambient temperature is less than 40 F.
    - 3.1.4 Heating Bitumen: Asphalt shall not be heated above 475 F. Coal tar shall not be heated above 400 F. Application temperatures shall be measured at the mop bucket and/or mechanical applicator.
  - 3.2 Application:
    - 3.2.1 NRCA-Specified Roofing Systems shall be applied in accordance with the NRCA specifications.
    - 3.2.2 Smooth Surfacing: Glaze-coat entire surface of completed built-up roof membrane with hot mopping of Type III asphalt, applied at same rate and concurrent with interply moppings. Allow asphalt coating to age a minimum of 7 days, then apply top coating of asphalt emulsion at an average rate of 2.5 gallons per square. If roof is to receive reflective coating, it shall be applied promptly after application and initial cure (next day) of emulsion coating at an average rate of 1.25 gallons per square.
    - 3.2.3 Mineral Surfacing: Promptly after completion of ply-sheet membrane (same day where possible), apply one lapped course of cap sheet. Set cap sheet in uniform mopping of same hot bitumen used in ply-sheet courses, at an average rate of 15 lbs per square. Lap ends a minimum of 6 inches.
    - 3.2.4 Cold-Process Roofing Systems:
      - 3.2.4.1 Glass-Fiber Reinforced Asphalt Emulsion: Nail or spot-mop the first ply felt. Apply additional plies with cold-process cement brushed, sprayed, or rolled on at the rate of approximately 1-1/2 gallons per square. If precipitation is expected within 48 hours, a solid mopping of hot asphalt shall be used instead of cold-process cement. Over the base sheet assembly, the asphalt emulsion shall be spray-applied with a three-nozzle gun that has a glass fiber cutter that disperses glass fibers 3/4 inches long into the emulsion as it is spray-applied. Reinforced asphalt emulsion shall be sprayed at the rate of approximately 9 gallons of emulsion and 3 pounds of glass-fiber reinforcement per square. If the roof is designated to receive a reflective coating, it shall be applied as soon as the asphalt emulsion membrane is firm enough to support roof traffic without indentations forming in the film.
      - 3.2.4.2 Mastic System: Embed ply felts in mastic sprayed at a rate of approximately 2-1/2 gallons per square per coat. Embed mineral surfacing in top coat of mastic.
  - 3.3 Accessories and Flashings: Install flashings as recommended by the NRCA Roofing and Waterproofing Manual and the SMACNA Architectural Sheet Metal Manual. Set walkways in additional pour-coat of hot bitumen after aggregate surfacing of built-up roofing membrane.
  - 3.4 Surface Maintenance of Existing Aggregate Surfaced Roofs:
    - 3.4.1 Preparation: Sweep surface and remove all loose and poorly embedded existing aggregate before applying new surface materials.
    - 3.4.2 Primer: Apply thin coat of asphalt primer over affected areas. Allow to dry thoroughly before applying flood coat.
    - 3.4.3 Flood Coat: Apply hot bitumen of type compatible with existing roofing materials, at a rate of 60 pounds per square for Type III asphalt and 75 pounds per square for coal tar.
    - 3.4.4 Aggregate Surfacing: While bitumen is hot, embed clean surfacing aggregate of type to match existing, applied at a rate of 400 pounds per square for gravel, 300 pounds per square for slag, and 400 pounds per square for crushed stone.

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3.5 Maintenance and Repair Patching (Hot-Applied Roofing):

- 3.5.1 Blisters: Make two cuts at right angles to each other, extending cuts 12 inches beyond edge of defective areas and to substrate surface. Fold back cut areas and allow substrate and membrane to dry. Wet insulation shall be removed and replaced with dry insulation matching the original. When dry, apply solid bitumen mopping over opened area and fold cut sections of membrane into bitumen. Totally embed membrane in bitumen.
- 3.5.2 Splits: Cut out membrane at least 12 inches on each side and extending 18 to 24 inches on each side and extending 18 to 24 inches beyond each end of split area. Dry lay a 6-inch wide strip of roofing felt, cemented over split area. Apply uniform coat of bitumen over dry felt, extending to embedded aggregate in all directions.
- 3.5.3 Disintegrated and Damaged Felts: Cut and remove disintegrated, damaged, and loose felts to extent necessary to provide sound materials. Cut out wet felts and allow wet surfaces to completely dry before in-stalling patch materials. Replace removed felts with equal plies of felt. Felts shall be solidly mopped into place in hot bitumen and shingled into existing plies to extent possible.
- 3.5.4 Additional Plies: Finish defective areas by applying at least two additional plies of roofing felt, embedded in hot bitumen. Extend edges of first ply a minimum of 9 inches beyond affected area on all sides and second ply 18 inches beyond affected area on all sides.

**Polymer-modified Asphalt Built-up Roofing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of a class "A" fire rated 12 Year Built Up Roofing System conforming to a manufacturer's standard, prefabricated, reinforced polymer-modified fiberglass sheets (base sheet & 3 plies), SEBS asphalt, gravel ballast with insulation, flashing, and accessories as specified and indicated. The manufacturer shall have a minimum of 10 years experience in manufacturing of the proposed roofing system for similar applications. Roofing Contractor shall warrant workmanship for a period of two (2) years from date work is accepted in addition to all manufacturer's or supplier warranties. Demolition and removal of materials shall be as specified and as required to support the work. Work shall conform to NRCA, SMACNA industry standards and material manufacturer's recommendations.
- 2.0 PRODUCTS:
  - 2.1 Primer: Asphalt, ASTM D 41.
  - 2.2 Bitumen:
    - 2.2.1 Asphalt: Modified-Asphalt (SEBS), ASTM D 312, Type III for slopes up to 25 percent (1/4 inch per foot vertical/horizontal) and Type IV for slopes up to 50 percent (1/2 inch per foot vertical/horizontal) or as specified by roof material manufacturer.
    - 2.2.2 Mastic: Cement shall conform to ASTM D 4586 and as recommended by roof materials manufacturer.
  - 2.3 Cants: Treated fiberboard, ASTM C 208; wood blocking treated with waterborne preservative, AWPA C9 listed in AWPA P5. Cants shall have maximum 5-1/2 inch face dimensions at a 45 degree incline to roof plane and lengths as long as practical. Field cut ends of wood cants shall be field treated with AWPA M4.
  - 2.4 Felts:
    - 2.4.1 Fiberglass Felts:
    - 2.4.2 Plies: ASTM D 2178, Type IV Sheets shall be a polymer modified asphalt of styrene butadiene styrene (SBS); or SBS which has been further modified with styrene ethylene butadiene styrene (SEBS). Sheets shall be reinforced with fiber made from glass, polypropylene, or polyester. as recommended by the manufacturer by Allied Signal, Manville, GAF Corporation, Siplast or equal.
  - 2.5 Flashing:
    - 2.5.1 Base Flashing: Flashing shall be White, SBS/SEBS polymer modified asphalt, mineral surfaced cap ply as recommended by material manufacturer.
    - 2.5.2 Metal Flashing: Metal flashing as specified and as required.
    - 2.5.3 Flashing Cement: MBR type only (asbestos free), compatible for use with SBS/SEBS polymer modified built-up roof system.
    - 2.5.4 Cap Flashing Underlayment Membrane: Protective underlayment, SBS/SEBS modified asphalt flashing material with polyester face, paper backed, with adhesive. TAMKO, Moisture Guard Plus or

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- equal.
- 2.6 Nails and mechanical Fasteners:
    - 2.6.1 Roof Nails: Galvanized or non-ferrous type, size as required to suite application and as recommended by roof materials manufacturer.
    - 2.6.2 Mechanical Fasteners for Flexible Flashing: Masonry, specially heat treated, stress relived, I-1/4 inch; Masonry nails manufactured by Simplex Nails, Inc. or equal. Wood blocking, high carbon, zinc coated steel, annular threaded shank nails; with minimum 1 inch x 30 gauge metal disk; Roofing nails manufactured by Simplex Nails, Inc or equal.
    - 2.6.3 Mechanical Fasteners for Insulation to Steel Deck: #14 screw with corrosive resistant coating (able to pass 30K cycles) with compatible disk; sufficient screw shank length to penetrate steel deck in accordance with manufacturer's instruction for base layer of insulation. Plastic disks shall have provision for recessed fastener head.
    - 2.6.4 Mechanical Fasteners for Metal Flashing: As recommended by materials manufacturer.
  - 2.7 Surfacing Materials: Surfacing shall be light colored, crushed stone or gravel conforming to ASTM D 1863.
  - 2.8 Adhesive: Adhesive shall be approved type recommended by the roofing membrane manufacturer.
  - 2.9 Walkway Surfaces: Walkways shall be mineral asphalt planks, Minimum inch thick, ASTM D517 as specified or as recommended by roof membrane manufacturer.
  - 2.10 Wood Nailers and Edge Blocking: As specified and as required, Non-stress graded wood members, treated with waterborne preservative in compliance with AWFBI LP-2.
  - 2.11 Insulation: As specified and as required, insulation shall be compatible with roof membrane as recommended by material manufacturer and installed in accordance with FM I-90, NRCA and manufacturer recommendations.
  - 2.12 Metal Flashing, Gravel Guards, Gutters, and Downspouts and accessories: As specified and as required.
  - 2.13 Coating: As specified; aluminum coating shall conform to ASTM D 2824 Type I or III, or shall be as recommended by roof membrane manufacturer.
  - 2.14 Pitch Pan: As specified and indicated; Pitch pans shall have rain cap and shall be filled with a 2 part pourable sealant. Sealant shall conform to ASTM D 529, Firestone Rubber-guard sealer S-10 or equal.
  - 3.0 EXECUTION
    - 3.1 Preparation Requirements: The substrate construction of any bay or section of building shall be clean before roofing work is begun thereon. Vents and other items penetrating the roof shall be secured in position and properly prepared for flashing. Nailers, curbs and other items attached to roof surface shall be in place before roofing is begun.
    - 3.2 Installation of Cants: Cants shall be installed in the angles formed between the roof and walls or other vertical surfaces. Cants shall be laid in a solid coat of bituminous cement just prior to laying the base sheet or membrane. Cants shall be continuous, and shall be installed in lengths as long as practicable.
    - 3.3 Condition of Surfaces: Surfaces shall be inspected and approved immediately prior to application of roofing and flashing. The roofing and flashing shall be applied to a smooth and firm surface free from ice, frost, visible moisture, dirt, projections, and foreign materials. Prior to application of primer on pre-cast concrete decks, joints shall be covered with 4 inch strip of roofing felt, embedded in and coated with bituminous cement.
    - 3.4 Application of Roofing System: Application shall be in accordance with NRCA specifications and roofing materials manufacturer recommendations and warranties.
    - 3.5 Mechanical Application Devices: Mechanical application devices shall be mounted on pneumatic-tired wheels, and shall be designed and maintained to operate without damaging the insulation, roofing membrane, or structural components.
    - 3.6 Priming: Concrete, masonry and metal surfaces to receive bitumen shall be uniformly coated with primer at a rate of not less than 0.4 liters per square meter, 1 gallon per square and allowed to dry.
    - 3.7 Heating of Asphalt: Asphalt shall not be heated higher than 75 degrees F above EVT or 50 degrees F below the flash point or 525 degrees F (maximum) whichever is lower. EVT and flash point

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- temperatures of asphalt in the kettle shall be conspicuously posted on the kettle. Heating kettle shall be provided with automatic thermostatic control and an accurate thermometer. Kettle operator shall be in attendance at all times during the heating to ensure that the maximum temperature specified is not exceeded. An asphalt tanker shall be treated as a kettle.
- 3.8 Asphalt Application: Asphalt shall be applied within 25 degrees F below or above the EVT, or 400 degrees F, whichever is higher. Application temperatures shall be measured at the mop bucket or mechanical applicator. Bitumen at a temperature below the recommended temperature shall be returned to the kettle.
  - 3.9 Application of Base Sheet: Base sheet shall be applied, shingle fashion, in a continuous operation, with side laps in accordance with manufacturer's printed instructions. End laps shall be not less than 6 inches and staggered a minimum of 24 inches. Base sheets shall be applied at right angles to the slope (except on curved or steep deck) and laps shall be face down the slope. Venting base sheet shall be mechanically fastened in conformance with manufactured printed instructions. Non vented base sheet on insulation shall be applied in hot mopping of not less than 20 pounds nor more than 35 pounds of modified asphalt per square and shall be embedded in the hot asphalt with squeegee or broom to eliminate air pockets and ensure complete adhesion. Operator shall avoid heavy application of squeegee to glass-fiber sheets.
  - 3.10 BUR Felts Application: Felt plies shall be installed as recommended by the membrane manufacturer. Each sheet in each ply shall be fully adhered to the underlying surface. Sheet edges shall lie flat, with no fish-mouths or wrinkles. Installation shall begin at the low point of the roof and progress to the high point with each sheet installed in shingle fashion. Each sheet shall be unrolled to provide 4 inch side laps and 6 inch end laps. End laps shall be staggered not less than 24 inches. Laps shall not coincide with laps of base layer except at lines of permanent termination. Sheets shall be adhesive-bonded in SBS/SEBS asphalt as specified in manufacturer's approved written instructions.
  - 3.11 Termination at Perimeters: The BUR felts shall extend up abutting surfaces at least 4 inches or 2 inches above top of the cant.
  - 3.12 Mechanical Fastening of Insulation: Nails and fasteners for securing base or membrane sheet to wood nailers or deck shall be flush driven through disk. Screw fasteners with disk as specified by the membrane manufacturer shall be used on concrete or metal deck. Nailers and fasteners shall be spaced to meet I-90 wind uplift requirements and within tolerance specified by the manufacturer. Penetration of nails and fasteners will not be permitted through the exposed surface of the membrane.
  - 3.13 Protection of Applied Roofing: At end of day's work or whenever precipitation is imminent, the terminated edge of the roofing shall be sealed with two full width strips of roofing felt set in and coated with bitumen cement or hot mopped asphalt. One half-width of strip shall be extended up and over the finished roofing and other half-width extended out and onto the bare roof deck or existing membrane. Sealing strips shall be removed before continuing installation of the roofing. To facilitate sealing, termination edges may be straightened with pieces of insulation board and shall be removed when work is resumed.
  - 3.14 Flashing: Flashing shall be provided over cants, in the angles formed at walls and other vertical surfaces, and where required to make work watertight. All penetrations shall receive flashing as required. Polymer mineral surfaced flashing shall be used, except where metal flashing is required or specified. Metal cap flashing shall have peel and stick rubber membrane (ice dam) flashing applied between cap wall and metal flashing.
  - 3.15 Walkways: Walkways shall be mineral-surfaced asphalt planks, back mopped and embedded in the flood coat prior to aggregate surfacing and shall be located as indicated are as required.
  - 3.16 Surfacing: After roofing membrane has been laid and flashing installed, the roof surface, except cants, shall be flood coated uniformly with 60 pounds SBS/SEBS hot asphalt per square, and while asphalt is still hot, aggregate surface material shall be spread on the hot bitumen at the rate of 400 pounds per square.
  - 3.17 Inspection: The Contractor and applicator shall establish and maintain an inspection procedure to assure compliance of the installed roofing system. The materials manufacturer shall certify, inspect and issue written warranties. Any work found not in compliance shall be promptly removed or

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repaired in an approved manner. Inspection shall include, but not limited to, the following:

- 3.17.1 Observation of environmental conditions; number and skill level of roofing workers; start and end time of various tasks; condition of substrate.
- 3.17.2 Verification of compliance of materials before, during and after installation.
- 3.17.3 Inspection of condition of equipment and accuracy of thermometers and metering devices.
- 3.17.4 Inspection of flashing, cants, and curbs.
- 3.17.5 Inspection of membrane placement, widths of starter sheets, laps, proper use of squeegee, and mechanical fastening.
- 3.17.6 Inspection of application of bitumen, aggregate, and walkways.
- 3.17.7 Inspection of embedded aggregate for required weight and coverage.
- 3.17.8 Sampling and analysis as directed.
- 3.17.8 Inspection of all metal work to include flashing, gutters and downspouts.
- 3.17.9 Final inspection that roof system is watertight and complete.

**Single Ply Roofing**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of single ply roofing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Roll Roofing: ASTM D 371, Type II, for mineral surfaced; ASTM D 224, Type II, for smooth surfaced.

2.2 Elastic Sheet Roofing: Elastic sheet material shall be EPDM, hypalon, neoprene, polyvinyl chloride, chlorinated polyethylene, polyisobutylene, or modified bitumen (reinforced or unreinforced), as required. Provide products that are fully compatible with indicated substrates or provide separation materials as required to eliminate contact between incompatible materials. The elastic sheet roofing shall meet the following requirements based on type of installation.

2.2.1 For Loose-Laid Ballasted System: Manufacturer's standard thickness but not less than 45 mils, 1,400 psi minimum tensile strength (ASTM D 412), 250 percent elongation (ASTM D 412), vapor permeable, ultraviolet and ozone resistant, low temperature brittleness of -40 F (ASTM D 746).

2.2.2 For Mechanically Fastened System: Manufacturer's standard thickness but not less than 60 mils, 1,600 psi minimum tensile strength (ASTM D 412), minimum tear resistance of 150 lbs/lin in (ASTM D 624), 300 percent elongation (ASTM D 412), ultraviolet and ozone resistant, low temperature brittleness of -40 F (ASTM D 746), standard color.

2.2.3 For Fully Adhered System: Manufacturer's standard thickness but not less than 60 mils, 1,400 psi minimum tensile strength (ASTM D 412), 250 percent minimum elongation (ASTM D 412), ultraviolet and ozone resistant, low temperature brittleness of -40 F (ASTM D 746), standard or special color, as required.

2.3 Fluid-Applied Roofing: Fluid-applied materials shall be sprayed-in-place urethane roofing with two-coat elastomeric silicone rubber protective coating.

2.3.1 Urethane Foam:

PROPERTY	ASTM TEST METHOD	VALUE
Density, pcf overall	D 1622	2.5 min., 3.5max.
Compressive Strength psi parallel to rise	D 1621	40.0 min.
Thermal Conductivity (k factor) Btu/hr/ sq ft/degrees F/in.	C 177	new 0.11 max. aged 0.15 max. (6 months)

2.3.2 Elastomeric Protective Coating: Two-coat silicone rubber system, bonded to urethane foam:

PROPERTY	ASTM TEST METHOD	VALUE
Tensile Strength, psi	D 412	500-600
Elongation, percent	D 412	100-150
Hardness	D 2240	45

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2.4 Roofing Installation Accessories:

2.4.1 Roll Roofing:

2.4.1.1 Roofing nails shall be 12-gauge galvanized with minimum 3/8-inch diameter head and 7/8-inch long shank.

2.4.1.2 Cement shall be cold process asphalt as recommended by material manufacturer.

2.4.2 Elastic Sheet Roofing:

2.4.2.1 Ballast for loose-laid ballasted systems shall be washed round riverbed gravel, ranging in size from 3/4 inch to 1-1/2 inches in diameter.

2.4.2.2 Mechanical fasteners used with mechanically fastened system shall be screws, nails, battens, accessory components, and adhesives as appropriate for the substrate.

2.4.2.3 Adhesive for fully adhered system shall be compatible with substrate and project conditions and formulated to withstand a minimum 60 psf uplift force.

2.4.2.4 Protective color coat as required for mechanically fastened and fully adhered systems shall be ozone-resistant, liquid-applied hypalon.

2.4.2.5 Flashing material shall be compatible with the membrane.

2.4.2.6 Membrane seaming system shall be of manufacturer's standard materials for sealing lapped joints, including edge sealer to cover exposed spliced edges.

2.4.2.7 Cant strips and flashing accessories shall be compatible with membrane, including adhesive tapes, flashing cements, and sealants.

2.4.2.8 Slip sheet for protection of membrane from incompatible substrate shall be as recommended by membrane manufacturer.

2.4.2.9 Walkway protection boards, where required, shall be prefabricated concrete pavers containing no asphalt or coal-tar derivatives, suitable for use without cracking or breaking.

2.4.3 Fluid-Applied Roofing: Ceramic granules shall be No. 11 screen size dry and free from dust.

2.5 UL Listing: Single ply roofing systems and component materials that have been tested for application and slopes and are listed by Underwriters' Laboratories, Inc. (UL) for Class A or Class B external fire exposure shall be provided. Single ply roof covering materials shall bear the Classification marking (UL) on bundle, package, or container indicating that materials have been produced under UL's Classification and Follow-Up Service.

2.6 FM Listing: Single ply roofing systems and component materials that have been evaluated by Factory Mutual System for fire spread, wind uplift, and hail damage are listed in the "Factory Mutual Approval Guide" for Class 1 construction. Single ply roofing systems and component materials bearing FM approval marking on bundle, package, or container indicating that the material has been subjected to FM's examination and follow-up inspection service shall be provided.

3.0 EXECUTION:

3.1 Preparation:

3.1.1 Roll Roofing: Clean wood deck completely. Ensure that all nails are driven flush with or below deck surface. Surface must be dry before placing any roofing material.

3.1.2 Elastic Sheet Roofing: Clean of dust, debris, or other substances detrimental to work. Remove sharp projections. Prime substrate as required.

3.1.3 Fluid Applied Roofing: Clean all debris from roof surface, new or existing. On existing roof, repair any roof damage to provide a clean smooth surface.

3.2 Installation:

3.2.1 Roll Roofing: Install in accordance with the National Roofing Contractors Association Steep Roofing Manual application instructions.

3.2.2 Elastic Sheet Roofing and Fluid Applied Roofing: Install in accordance with manufacturer's instructions.

**Inverted Roof Systems**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of inverted roof systems. Materials shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to

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support the work.

2.0 PRODUCTS:

- 2.1 Asphalt Primer: ASTM D 41.
  - 2.2 Fiberglass Base Sheet: Glass fiber mat coated with weathering grade asphalt to provide a nonporous ply.
  - 2.3 Fiberglass Felt: ASTM D 2178, Type IV.
  - 2.4 Sheathing Paper: Single ply 5 lb/100 sq ft, rosin-sized sheathing paper.
  - 2.5 Base for built-up membrane applied over steel deck shall be one of the following with mechanical attachment:
    - 2.5.1 Mineral Fiberboard: ASTM C 726, 3/4 inch thick.
    - 2.5.2 Wood Fiberboard: Organic fiberboard roof insulation in accordance with ASTM C 208, 1 inch thick.
    - 2.5.3 Gypsum Wallboard: 1/2 inch thick, ASTM C 36.
  - 2.6 Steep Asphalt: ASTM D 312, Type III.
  - 2.7 Extruded Rigid Polystyrene Insulation: ASTM C 578, Type IV, 24-inch by 48-inch standard size, with drainage channel on bottom of each board.
  - 2.8 Galvanized Roofing Nails: 11 gauge, barbed, galvanized with 7/16-inch to 5/8-inch diameter heads or other approved type.
  - 2.9 Fabric for Application Above Insulation: 3 oz/sq yd black polyester or 3 oz/sq yd black polypropylene approved by inverted roof system manufacturer.
  - 2.10 Ballast: Gravel or crushed stone shall be in accordance with ASTM D 448, Gradation No. 57.
  - 2.11 UL Listing: Inverted roof systems and component materials that have been tested for application and slopes and are listed by Underwriters' Laboratories, Inc. (UL) for Class A or Class B external fire exposure shall be provided. Inverted roof systems and component materials shall bear the Classification marking (UL) on bundle, package, or container indicating that materials have been produced under UL's Classification and Follow-Up Service.
  - 2.12 FM Listing: Inverted roof systems and component materials that have been evaluated by Factory Mutual system for fire spread, wind uplift, and hail damage are listed in the "Factory Mutual Approval Guide" for Class 1 construction. Inverted roof systems and component materials bearing FM approval marking on bundle, package, or container indicating the material has been subjected to FM's examination and follow-up inspection service shall be provided.
- 3.0 EXECUTION:
- 3.1 Installation on Various Deck Materials:
    - 3.1.1 On lightweight insulating concrete decks, prime concrete surface with asphaltic primer.
    - 3.1.2 On poured gypsum decks, lay one ply of approved fiberglass base sheet with edges lapped and nailed with nails approved for use with gypsum deck materials.
    - 3.1.3 On precast concrete plank deck or precast concrete tee deck, prime concrete surfaces with asphalt primer. Prior to applying built-up roof membrane, apply 18-inch wide slip sheet of 2-ply dry-applied fiberglass felt to cover end joints where concrete planks or tees meet.
    - 3.1.4 On wood decks, cover the deck with sheathing paper lapping and mechanically fastening each sheet to the deck. Over sheathing paper, apply one ply of approved fiberglass base sheet, lapping joints and nailing, using galvanized roofing nails driven through flat metal disks not less than 1 inch in diameter.
  - 3.2 Built-up Roof Membrane Installation:
    - 3.2.1 Starting at low point of roof, uniformly mop the surface of the nailed fiberglass base sheet or primed deck surface with steep asphalt at the rate recommended for substrate (25 +/- 5 to 30 +/- 5 lbs per square). While hot, embed 3 plies of approved fiberglass felts in shingle fashion, lapping each sheet 24-2/3 inches.
    - 3.2.2 Interply moppings shall be continuous and applied at the rate listed above for substrate. Complete embedment of felts is required and is accomplished by dragging a broom or squeegee over the felt; no more pressure is required than that exerted by the weight of the "brooming" utensil. During cold weather, effective brooming is essential to eliminate voids and to ensure adhesion. As the work progresses, full mop the top surface of the membrane using a minimum coverage of 25 +/- 5 lbs per square. A second flood coat shall be applied at the rate of 45 lbs per square.
    - 3.2.3 At no time shall felts be left exposed overnight or in inclement weather. All mopping bitumen shall

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- be steep asphalt (Type III, 185-205 F softening point).
- 3.2.4 Bitumen temperature at the kettle shall be controlled so as not to exceed the bitumen manufacturer's recommendations. The roof membrane shall not be staged. Temporary membranes are not acceptable as a part of a completed membrane. Install completed membrane in final form on a day-to-day basis.
  - 3.3 All flashing shall be completed in each area prior to installing roof insulation. Details and installation shall conform to standard inverted roof system specifications.
  - 3.4 Unadhered Insulation Installation:
    - 3.4.1 General: Rigid polystyrene insulation shall be placed on the membrane as the membrane is completed to provide immediate protection. Flood coats of steep asphalt shall be allowed to cool completely prior to rigid insulation installation to ensure unadhered foam.
    - 3.4.2 Rigid polystyrene insulation shall be placed directly on membrane with channel side down. End joints shall be staggered and all boards shall be tightly abutted. The maximum acceptable opening between boards shall be 3/8 inch. Install insulation to within 3/4 inch of all projections and cant strips. For multilayer installations, install subsequent layers unattached over the unadhered first layer. Stagger all joints in relation to underlying layer. The bottom layer shall be as thick or thicker than the top layer and must be a minimum of 2 inches thick.
    - 3.4.3 Fabric Installation: Place fabric over rigid insulation, unadhered and unattached. Fabric shall be wetted to hold it in place until ballast is installed. Edges shall be overlapped a minimum of 1 foot. Install so that there are no parallel joints within 6 feet of the perimeter. Extend fabric 2 to 3 inches above the stone at perimeter and penetrations.
    - 3.4.4 Thickness of Insulation: Installed thickness shall provide a U-value through completed roof structure, air-to-air, not in excess of that required by job location, as determined for winter conditions in accordance with recognized methods in agreement with ASHRAE Handbook Fundamentals.
  - 3.5 Ballast Installation:
    - 3.5.1 General: Fabric shall be covered with gravel or crushed stone ballast as the fabric is being installed. The stone top covering shall be 3/4 inch with not less than 10 percent nor more than 60 percent of fines smaller than 1/2 inch. 3.5.2 Stone or Gravel Ballast shall be applied at a minimum average rate of 1,000 lbs per square and shall be approximately 1-1/4 inches thick. Around roof perimeter and at penetrations and drains, 20 lbs/sq ft of stone ballast over a 4 foot wide area shall be applied. A continuous row of pavers constituting 22 lbs/lin ft can be substituted for the extra ballast around perimeter, penetrations and drains. Pavers shall be used in high traffic areas near roof and equipment access areas.

**Modified Bitumen Roofing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of a Class "A" Fire rated 12 Year modified bitumen roofing system conforming to a manufacturer's standard, prefabricated, reinforced polymer-modified bitumen membranes (base sheet, 1 or 2 ply heavy weight plies and cap sheet), SEBS asphalt, with insulation, flashing, and accessories as specified and indicated. The manufacturer shall have a minimum of 10 years experience in manufacturing of the proposed modified bitumen sheet roofing for similar applications. Roofing Contractor shall warrant workmanship for a period of two (2) years from date work is accepted in addition to all manufacturer's or supplier warranties. Demolition and removal of materials shall be as specified and as required to support the work. Work shall conform to NRCA, SMACNA industry standards and material manufacturer's recommendations.
- 2.0 PRODUCTS:
  - 2.1 Primer: Asphalt, ASTM D 41.
  - 2.2 Bitumen:
    - 2.2.1 Asphalt: Modified-Asphalt (SEBS), ASTM D 312, Type III for slopes up to 25 percent (1/4 inch per foot vertical/horizontal) and Type IV for slopes up to 50 percent (1/2 inch per foot vertical/horizontal) or as specified by roof materials manufacturer.
    - 2.2.2 Mastic: Cement shall conform to ASTM D 4586 and as recommended by roof materials manufacturer.

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- 2.3 Cants: Treated fiberboard, ASTM C 208; wood blocking treated with waterborne preservative, AWPA C9 listed in AWPA P5. Cants shall have maximum 5-1/2 inch face dimensions at a 45 degree incline to roof plane and lengths as long as practical. Field cut ends of wood cants shall be field treated with AWPA M4.
  - 2.4 Felts:
    - 2.4.1 Fiberglass Felts:
    - 2.4.2 Plies: ASTM D 2178, Type IV or VI as recommended by the manufacturer.
    - 2.4.3 Modified Bitumen Base Sheet: ASTM D 4897, Type II for vented sheets or ASTM D 4601, Type II for non-vented sheets. Sheets shall be a bitumen modified asphalt with styrene butadiene styrene (SBS); or SBS that has been further modified with styrene ethylene butadiene styrene (SEBS). Sheets shall be reinforced with fiber made from glass, polypropylene, or polyester manufactured by Allied Signal, Johns Manville, GAF Corporation, Siplast or equal.
  - 2.5 Flashing:
    - 2.5.1 Base Flashing: Flashing shall be White or Metal Clad finish as specified, SEBS modified Bitumen cap ply as recommended by material manufacturer.
    - 2.5.2 Metal Flashing: Metal flashing as specified and as required.
    - 2.5.3 Flashing Cement: MBR type only (asbestos free), compatible for use with SEBS modified bitumen roof system.
    - 2.5.4 Cap Flashing Underlayment Membrane: Protective underlayment, SEBS modified asphalt flashing material with polyester face, paper backed, with adhesive. TAMKO, Moisture Guard Plus or equal.
  - 2.6 Nails and mechanical Fasteners:
    - 2.6.1 Roof Nails: Galvanized or non-ferrous type, size as required to suite application and as recommended by roof materials manufacturer.
    - 2.6.2 Mechanical Fasteners for Flexible Flashing: Masonry, specially heat treated, stress relived, I-1/4 inch; Masonry nails manufactured by Simplex Nails, Inc. or equal. Wood blocking, high carbon, zinc coated steel, annular threaded shank nails; with minimum 1 inch x 30 gauge metal disk; Roofing nails manufactured by Simplex Nails, Inc or equal.
    - 2.6.3 Mechanical Fasteners for Insulation to Steel Deck: #14 screw with corrosive resistant coating (able to pass 30K cycles) with compatible plastic disk; sufficient screw shank length to penetrate steel deck in accordance with manufacturer's instruction for base layer of insulation. Plastic disks shall have provision for recessed fastener head.
    - 2.6.4 Mechanical Fasteners for Metal Flashing: As recommended by materials manufacturer.
  - 2.7 Surfacing Materials: Surfacing shall factory applied granules requiring no further coating.
  - 2.8 Adhesive: Adhesive shall be approved type recommended by the roofing membrane manufacturer.
  - 2.9 Walkway Surfaces: Walkways shall be mineral asphalt planks, minimum inch thick, as specified or as recommended by roof membrane manufacturer.
  - 2.10 Wood Nailers and Edge Blocking: As specified and as required, Non-stress graded wood members, treated with waterborne preservative in compliance with AWFB LP-2.
  - 2.11 Insulation: As specified and as required, insulation shall be compatible with roof membrane as recommended by material manufacturer and installed in accordance with FM I-90, NRCA and manufacturer recommendations.
  - 2.12 Metal Flashing, Gravel Guards, Gutters, and Downspouts and accessories: As specified and as required.
  - 2.13 Coating: As specified; aluminum coating shall conform to ASTM D 2824 Type I or III, or shall be as recommended by roof membrane manufacturer.
  - 2.14 Pitch Pan: As specified and required; Pitch pans shall have rain cap and shall be filled with a 2 part pourable sealant. Sealant shall conform to ASTM D 529, Firestone Rubberguard pourable sealer S-10 or equal.
- 3.0 EXECUTION
- 3.1 Preparation Requirements: The substrate construction of any bay or section of building shall be clean before roofing work is begun thereon. Vents and other items penetrating the roof shall be secured in position and properly prepared for flashing. Nailers, curbs and other items attached to roof surface shall be in place before roofing is begun.
  - 3.2 Installation of Cants: Cants shall be installed in the angles formed between the roof and walls or

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- other vertical surfaces. Cants shall be laid in a solid coat of bituminous cement just prior to laying the base sheet or membrane. Cants shall be continuous, and shall be installed in lengths as long as practicable.
- 3.3 Condition of Surfaces: Surfaces shall be inspected and approved immediately prior to application of roofing and flashing. The roofing and flashing shall be applied to a smooth and firm surface free from ice, frost, visible moisture, dirt, projections, and foreign materials. Prior to application of primer on pre-cast concrete decks, joints shall be covered with 4 inch strip of roofing felt, embedded in and coated with bituminous cement.
  - 3.4 Application of Roofing System: Application shall be in accordance with NRCA specifications and roofing materials manufacturer recommendations and warranties.
  - 3.5 Mechanical Application Devices: Mechanical application devices shall be mounted on pneumatic-tired wheels, and shall be designed and maintained to operate without damaging the insulation, roofing membrane, or structural components.
  - 3.6 Priming: Concrete, masonry and metal surfaces to receive bitumen shall be uniformly coated with primer at a rate of not less than 0.4 liters per square meter, 1 gallon per square and allowed to dry.
  - 3.7 Heating of Bitumen: Asphalt shall not be heated higher than 75 degrees F above EVT or 50 degrees F below the flash point or 525 degrees F (maximum) whichever is lower. EVT and flash point temperatures of asphalt in the kettle shall be conspicuously posted on the kettle. Heating kettle shall be provided with automatic thermostatic control and an accurate thermometer. Kettle operator shall be in attendance at all times during the heating to ensure that the maximum temperature specified is not exceeded. An asphalt tanker shall be treated as a kettle.
  - 3.8 Bitumen Application: Asphalt shall be applied within 25 degrees F below or above the EVT, or 400 degrees F, whichever is higher. Application temperatures shall be measured at the mop bucket or mechanical applicator. Bitumen at a temperature below the recommended temperature shall be returned to the kettle.
  - 3.9 Application of Base Sheet: Base sheet shall be applied, shingle fashion, in a continuous operation, with side laps in accordance with manufacturer's printed instructions. End laps shall be not less than 6 inches and staggered a minimum of 24 inches. Base sheets shall be applied at right angles to the slope (except on curved or steep deck) and laps shall be face down the slope. Venting base sheet shall be mechanically fastened in conformance with manufactured printed instructions. Non vented base sheet on insulation shall be applied in hot mopping of not less than 20 pounds nor more than 35 pounds of modified asphalt per square and shall be embedded in the hot asphalt with squeegee or broom to eliminate air pockets and ensure complete adhesion. Operator shall avoid heavy application of squeegee to glass-fiber sheets.
  - 3.10 Modified Bitumen Membrane Application: Membrane shall be three plies as recommended by the membrane manufacturer. Each sheet in each ply shall be fully adhered to the underlying surface. Sheet edges shall lie flat, with no fishmouths or wrinkles. Installation shall begin at the low point of the roof and progress to the high point with each sheet installed in shingle fashion. Each sheet shall be unrolled to provide 4 inch side laps and 6 inch end laps. End laps shall be staggered not less than 24 inches. Laps shall not coincide with laps of base layer except at lines of permanent termination. Sheets shall be adhesive-bonded as specified in manufacturer's approved written instructions.
  - 3.11 Termination at Perimeters: The modified bitumen membrane shall extend up abutting surfaces at least 4 inches or 2 inches above top of the cant.
  - 3.12 Mechanical Fastening: Nails and fasteners for securing base or membrane sheet to wood nailers or deck shall be flush driven through disk. Screw fasteners with disk as specified by the membrane manufacturer shall be used on concrete or metal deck. Nailers and fasteners shall be spaced to meet I-90 wind uplift requirements and within tolerance specified by the manufacturer. Penetration of nails and fasteners will not be permitted through the exposed surface of the membrane.
  - 3.13 Protection of Applied Roofing: At end of day's work or whenever precipitation is imminent, the terminated edge of the roofing shall be sealed with two full width strips of roofing felt set in and coated with bitumen cement or hot mopped asphalt. One half-width of strip shall be extended up and over the finished roofing and other half-width extended out and onto the bare roof deck or

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- existing membrane. Sealing strips shall be removed before continuing installation of the roofing. To facilitate sealing, termination edges may be straightened with pieces of insulation board and shall be removed when work is resumed.
- 3.14 Flashing: Flashing shall be provided over cants, in the angles formed at walls and other vertical surfaces, and where required to make work watertight. All penetrations shall receive flashing as required. Modified bitumen flashing shall be used, except where metal flashing is required or specified. Metal cap flashing shall have peal and stick rubber membrane (ice dam) flashing applied between cap wall and metal flashing.
  - 3.15 Walkways: Walkways shall be mineral-surfaced asphalt planks, back mopped and embedded in the flood coat prior to aggregate surfacing and shall be located as indicated or as required.
  - 3.16 Surfacing: Surface material shall be mineral surfaced or metal clad as specified.
  - 3.17 Inspection: The Contractor and applicator shall establish and maintain an inspection procedure to assure compliance of the installed roofing system. The materials manufacturer shall certify, inspect and issue written warranties. Any work found not in compliance shall be promptly removed or repaired in an approved manner. Inspection shall include, but not limited to, the following:
    - 3.17.1 Observation of environmental conditions; number and skill level of roofing workers; start and end time of various tasks; condition of substrate.
    - 3.17.2 Verification of compliance of materials before, during and after installation.
    - 3.17.3 Inspection of condition of equipment and accuracy of thermometers and metering devices.
    - 3.17.4 Inspection of flashing, cants, and curbs.
    - 3.17.5 Inspection of membrane placement, widths of starter sheets, laps, proper use of squeegee, and mechanical fastening.
    - 3.17.6 Inspection of application of bitumen, aggregate, and walkways.
    - 3.17.7 Inspection of embedded of aggregate for required weight and coverage.
    - 3.17.8 Sampling and analysis as directed.
    - 3.17.8 Inspection of all metal work to include flashing, gutters and downspouts.
    - 3.17.9 Final inspection that roof system is watertight and complete.

**Wood Traffic Topping**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of wood traffic topping. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Lumber: Standard grade or No. 2 grade, nonstress grade lumber. Lumber and material sizes shall conform to requirements of the rules or standards under which produced.
    - 2.1.1 Species of Nontreated Wood: Walkway members shall be fabricated of cypress or redwood.
    - 2.1.2 Preservative Treated Wood: Walkway members shall be fabricated of preservative treated lumber, treated by pressure method in compliance with AWPB LP-2 and so marked in compliance with AWPB standard. Preservative treated members shall be air-dried or kiln-dried and marked "DRY." Treated wood that is cut after treatment shall be brush-coated with preservative used in original treatment.
    - 2.1.3 Bitumen: Type used in roofing system.
    - 2.1.4 Bituminous Cement: Fed. Spec. SS-C-153, bituminous plastic cement.
    - 2.1.5 Type I: For use with asphalt roofing system.
    - 2.1.6 Type II: For use with coal-tar roofing system.
    - 2.1.7 Premolded Filler Strip: ASTM D 1751, minimum 3/8 inch thick.
    - 2.1.8 Cap Sheet: Fed. Spec. SS-R-630, asphalt saturated roofing felt, coated with strip asphalt both sides and surfaced on weathering side with mineral granules. Cap sheet shall weigh not less than 70 pounds per square.
    - 2.1.9 Prepared Roll Roofing: ASTM D 249, No. 90 asphalt saturated organic fiber felt, coated on both sides with asphalt and surfaced on weathering side with mineral granules.
- 3.0 EXECUTION:

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- 3.1 Preparation:
  - 3.1.1 Membrane Roofing:
    - 3.1.1.1 Bitumen Coating: Before installing walkways, areas to be covered shall be coated with 40-inch wide continuous path of bitumen used for roofing system.
    - 3.1.1.2 Cap Sheet Protection Course: Embed cap sheet strips in solid coat of roofing cement. Set strips at right angles to direction of walkway and 48 inches apart.
    - 3.1.1.3 Premolded Filler Strip: Embed premolded filler strip in solid coat of roofing cement. Set filler at right angles and direction of walkway and 48 inches on center.
    - 3.1.1.4 Sloping Roofs: Cover areas to be covered with wood walkways with one continuous ply of prepared roll roofing material, embedded in steep asphalt applied at rate of 25 pounds per square. Roofing sheet shall be of width to extend minimum of 4 inches beyond both sides of walkway area.
- 3.2 Installation:
  - 3.2.1 Installation of Walkways on Flat Surfaces:
    - 3.2.1.1 Wood Bases: Nominal 2-inch by 6-inch wood base members, maximum of 32 inches long, shall be set into solid uniform layer of bituminous cement, 12 inches wide and spaced 48 inches apart. Apply cement over protection course or premolded filler when applied.
    - 3.2.1.2 Securing in Place: Fasten runners to wood base members with metal angle braces or nail in place. Fasteners shall not penetrate through base units into roofing material. Runners shall be 12 feet minimum length, and joints shall occur over wood bases.
    - 3.2.1.3 Walkways: Nail 1-inch by 4-inch boards, spaced maximum 1/2 inch apart, to 2-inch by 4-inch wood runner members standing on edge, spaced maximum 26 inches apart. Walkway boards shall extend maximum of 4 inches over runners at each side. Nail walkway boards to runner with minimum two nails per board.
    - 3.2.1.4 Roof Surfacing: Apply roof surfacing material to roof surface after wood bases are installed and before walkways are fastened in place. Do not apply surfacing material over wood bases, only between and around.
  - 3.2.2 Installation of Walkways on Sloped Surfaces:
    - 3.2.2.1 Runners: Run nominal 2-inch by 4-inch runners, spaced 24 inches apart maximum, directly over prepared roofing strip, and fasten to roof deck with angle fasteners or nailed directly into deck.
    - 3.2.2.2 Walkway Boards: Nail nominal 1-inch by 4-inch boards to runners. Space walkway boards 6 inches on center, nail flush with outside edge of runners, and fasten to each runner with two nails.

**Composition Traffic Topping**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of composition traffic topping. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Composition Panels: ASTM D 517.
  - 2.2 Adhesive: ASTM D 2822, asphaltic roofing cement.
  - 2.3 Bitumen: Type used in roofing system.
- 3.0 EXECUTION:
  - 3.1 Preparation: Cut panels at the project site only when necessary to obtain sizes of panels different from those furnished.
  - 3.2 Installation:
    - 3.2.1 Spaced Panels: Space panels maximum of 6 inches apart.
    - 3.2.2 Butted Panels: Butt panels together to form continuous walkway areas.

**Precast Concrete or Tile Traffic Topping**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of precast concrete or tile traffic topping. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required

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to support the work.

2.0 PRODUCTS:

2.1 Precast Concrete Tiles:

2.1.1 Compressive Strength: Precast concrete tiles shall have a strength of 3,000 pounds per square inch at 28 days.

2.1.2 Quality Assurance: Absorption shall not exceed 8 percent by weight when tested in compliance with cold water absorption tests specified in ASTM C 1195.

2.2 Quarry Tile: ANSI A137.1.

2.3 Drainage Bed: ASTM D 1863, crushed stone, maximum size 1/2 inch.

2.4 Mortar Materials:

2.4.1 Portland cement: ASTM C 150, Type I, low alkali content.

2.4.2 Sand: ASTM C 144.

2.4.3 Hydrated Lime: ASTM C 207, Type S.

2.4.4 Setting Bed Mortar Mix: One part Portland cement, three parts damp sand.

2.4.5 Pointing Mortar: One part Portland cement, two parts fine graded sand, 1/5 part lime.

2.5 Sealant: Fed. Spec. TT-S-00227, Type I, two-component elastomeric type compound.

3.0 EXECUTION:

3.1 Preparation: Prior to installing any roof traffic tiles, coat areas to receive tiles with a solid application of bitumen used in roofing system.

3.2 Installation:

3.2.1 Drainage Bed: In areas to receive traffic roof tiles, install 1-1/2 inch thick drainage bed.

3.2.2 Tiles: Lay tiles in 1-inch thick mortar bed. Provide 3/16-inch to 1/4-inch wide joints between tiles.

**Sheet Metal**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of sheet metal. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS: Materials and fabrication shall comply with applicable recommendations and details of SMACNA Architectural Sheet Metal Manual.

2.1 Shop- and Job-Fabricated Sheet Metal Items may include the following:

a. Downspouts with clips, anchors, straps, and leaders.

b. Edge strip.

c. Flashings, including base, cap, eave, stepped, valley, apron, collar, through-wall and coping flashings.

d. Gravel stops and fasciae, extruded or formed.

e. Gutters, with continuous cleats, hangers, and cover plates.

f. Louvers.

g. Pitch pans.

h. Reglets.

i. Scuppers.

j. Splash pans.

k. Roofing, including batten seam, flat seam, standing seam, and bermuda seam types.

2.2 Aluminum:

2.2.1 Mill Finished Sheets: ASTM B 209, Alloy 3003, temper H14.

2.2.2 Colored Sheets: ASTM B 209, alloy Alclad 3003, temper H14.

2.3 Brass: ASTM B 36, copper alloy No. 260, rolled half-hard temper.

2.4 Copper: ASTM B 370, light cold-rolled temper, mill finish.

2.5 Lead Coated Copper: Cold-rolled sheet copper complying with ASTM B 370, coated with not less than 0.06 pounds per square foot of lead per side. Lead coating shall comply with ASTM B 101, Type I.

2.6 Stainless Steel: ASTM A 167, corrosion-resistant steel, annealed, AISI Type 301, No. 1 finish.

2.7 Copper Clad Stainless Steel: ASTM B 506, stainless steel sheet metal, coated with metallurgically-bonded cladding of copper on each face amounting to 10 percent of thickness (80 percent stainless

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- steel, 20 percent copper). Core shall comply with ASTM A 176, AISI Type 430. Copper cladding shall have mill finish.
- 2.8 Lead-Coated Copper Clad Stainless Steel: ASTM B 506, copper clad stainless steel sheet metal, coated on one side with 0.06 pounds per square foot of lead complying with ASTM B 101, Type I.
- 2.9 Terne-Coated Stainless Steel: Stainless steel core complying with ASTM A 167, AISI Type 304, with terne coating of 20 percent tin and 80 percent lead on both faces.
- 2.10 Terne-Coated Steel: Fed. Spec QQ-T-201, Type 1 commercial quality steel sheet core with 1.45 ounces coating of 20 percent tin and 80 percent lead on both faces.
- 2.11 Galvanized Steel: ASTM A 526, commercial quality carbon steel sheets with minimum 0.20 percent copper content, hot-dipped galvanized to comply with ASTM A 525, G 90 coating designation. Galvanized steel designated to be finished shall be mill phosphatized and coated with manufacturer's standard baked-on finish.
- 2.12 Zinc-Alloy: ASTM B 69, containing not less than 0.6 percent copper and 0.14 percent titanium, standard temper.
- 2.13 Lead Sheet: Fed. Spec. QQ-L-201, Grade B, formed from common desilverized pig lead, complying with ASTM B 29.
- 2.14 Fasteners:
- 2.14.1 General Use Fasteners: Same material as sheet metal to which attached, or as recommended by sheet metal manufacturer.
- 2.14.2 Fasteners for Copper Items: Bronze, brass, or copper types.
- 2.14.3 Fasteners for Aluminum:
- 2.14.3.1 Rivets: ASTM B 316, alloy 1100, temper H14, minimum shank diameter of 0.187 inch, length as required to form a head.
- 2.14.3.2 Screws and Bolts: ASTM B 211, alloy 6061, temper as appropriate for particular use.
- 2.14.3.3 Washers: Alloy 1100, temper H18 or same aluminum alloy as aluminum sheet or fasteners being used.
- 2.14.3.4 Noncorrosive Fasteners: Stainless steel, AISI Type 304.
- 2.14.3.5 Cleats: Formed of same material and thickness as sheet metal being installed, minimum 2 inches wide and long enough to be fully incorporated into work.
- 2.15 Solder: ASTM B 32, of type best suited for intended purpose.
- 2.16 Welding Electrodes:
- 2.16.1 Aluminum: Welding electrodes and filler alloy of type best suited for alloy of aluminum being welded. Paste flux shall be used in welding aluminum.
- 2.16.2 Stainless Steel: Type recommended by stainless steel producer for type of metal sheet furnished.
- 2.17 Burning Rods for Lead shall be same composition as lead sheet.
- 2.18 Miscellaneous Materials:
- 2.18.1 Felt: ASTM D 226, No. 15 asphalt-saturated organic felt, unperforated.
- 2.18.2 Sheathing Paper: Rosin-sized paper weighing not less than 6 pounds per square.
- 2.18.3 Bituminous Plastic Cement: Fed. Spec. SS-C-153, Type I for use with asphaltic roofing materials and Type II for use with coal-tar roofing materials.
- 2.18.4 Bituminous Coating: Fed. Spec. TT-C-494, Type II, cold-applied solvent type bituminous mastic coating for application in minimum dry film thickness of 12 mils per coat.
- 2.18.5 Primer Paint: Fed. Spec. TT-P-645, alkyd type zinc chromate.
- 2.18.6 Zinc Dust Paint: Mil. Spec. MIL-P-21035 galvanized sheet metal touchup paint.
- 2.18.7 Sealants: Non-drying mastic type as recommended for particular joint being sealed and anticipated movement within joint. One-part sealant shall be Fed. Spec. TT-S-00230, Type II, Class A. Two-component sealant shall be Fed. Spec. TT-S-00227, Type II, Class A.
- 2.18.8 Wood Nailers and Edge Blocking: Non-stress graded wood members, moisture-resistant, treated with waterborne preservative in compliance with AWPB LP-2 standard. Nominal dimensions of nailers shall be 1 inch by 3 inches, unless otherwise required.
- 2.18.9 Nonmetallic Through-Wall Flashing: Nonreinforced, homogeneous, waterproof, impermeable elastomeric sheeting having not less than 1,000 psi tensile strength nor more than 7 percent tension set at 50 percent elongation when tested in accordance with ASTM D 412. Sheeting shall resist exposure without visible deterioration when tested not less than 400 hours in accordance

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with ASTM D 822. Sheeting shall not crack or flake when exposed to low temperatures.

- 2.18.10 Miscellaneous Sheet Metal Roofing Materials:
  - 2.18.10.1 Wood Batten Strips shall be non-stress graded wood members of nominal 2 inches by 2 inches, pressure-treated with waterborne preservatives in compliance with AWPB LP-2, or other material that is compatible with sheet metal.
  - 2.18.10.2 Polyethylene Underlayment shall be a minimum of 6 mil chlorinated polyethylene film.
- 3.0 EXECUTION: Installation of sheet metal materials shall comply with applicable recommendations and details of SMACNA Architectural Sheet Metal Manual.
- 3.1 Nailing Strips and Edge Blocking: When deck surface is non-nailable, nailing strips and edge blocking shall be installed over surface of deck for anchorage of sheet metal materials.
- 3.2 Substrate Conditions: Surfaces to receive sheet metal materials shall be even, smooth, sound, thoroughly clean and dry, and free from defects that might affect application.
- 3.3 Fasteners shall be concealed wherever possible in exposed work.
- 3.4 Dissimilar Surfaces:
  - 3.4.1 Separate dissimilar metals by painting each metal surface in areas of contact with bituminous coating, or provide a layer of waterproof sheathing paper or asphalt-coated felt between contact surface.
  - 3.4.2 Separate metal items from treated wood and cementitious materials with bituminous coating, applied either to substrate or metal.
  - 3.4.3 Aluminum shall not be used when it will be in contact with copper or where it will contact water that flows over copper surfaces. Protect aluminum surface in contact with wet or pressure treated wood, cementitious materials, or ferrous metals from galvanic or corrosive action by applying one coat of zinc chromate primer and one coat of aluminum paint, or by placing layer of nonabsorptive tape or gasket between adjoining surfaces.
  - 3.4.4 Where asphalt-saturated felt has been applied under sheet metal that will be soldered or welded, cover felt with one layer of sheathing paper before installing sheet metal.
- 3.5 Sheet Metal Roofing:
  - 3.5.1 Removing Existing Sheet Metal Roofing: Remove sheet metal roofing in full sections or cut damaged sections where possible to make watertight joints between existing roofing and new materials to be installed.
  - 3.5.2 Preparing Existing Surfaces: Bent or raised portions of existing roofing shall be nailed down and repaired to extent necessary to provide smooth surface for sheet metal roofing.
  - 3.5.3 Application of Underlayment:
    - 3.5.3.1 Felt Underlayment: Apply one layer of asphalt-saturated roofing felt over deck surface and cover with one layer of sheathing paper. Underlayment plies shall be installed with mechanical fasteners spaced 6 inches in center at laps or adhesives as appropriate for substrate conditions.
    - 3.4.3.2 Polyethylene Film Underlayment: Install one layer of polyethylene film underlayment over deck surface with adhesive. Cover polyethylene film with one layer of sheathing paper applied with adhesive. Mechanical fasteners shall be installed only where deck surface presents nailable conditions.
  - 3.5.4 Coating Backside of Metal Sheets:
    - 3.5.4.1 Bituminous Coating: Coat back side of metal roofing with bituminous coating wherever metal will be in contact with wood, ferrous metal, or cementitious construction.
    - 3.5.4.2 Painting: Paint back side of metal roofing with zinc chromate type primer, minimum 2-mil dry film thickness.
  - 3.5.5 Expansion Seams: Provide loose lock or slip seams, as designated. Seams shall allow 1/2-inch for expansion and shall be sealed with sealant.
  - 3.5.6 Penetrations through roofing shall be flashed with sheet metal material to match roofing material.

**Roof Accessories**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of heat and smoke vents, roof hatches, gravity ventilators, prefabricated curbs and equipment supports, and curb-set expansion joints. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product

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- manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Comply with SMACNA Architectural Sheet Metal Manual details for fabrication of units, including flanges and capflashing to coordinate with type of roofing indicated.
  - 2.1 Zinc-Coated Steel: Commercial quality with 0.20 percent copper, ASTM A 525, G90 hot-dip galvanized, mill phosphatized.
  - 2.2 Stainless Steel: AISI Type 302/304, ASTM A 167, 2D annealed finish except as otherwise indicated, tempered as required for forming and performance.
  - 2.3 Aluminum Sheet: ASTM B 209, Alloy 3003, tempered as required for forming and performance; AA-C22A41 clear anodized finish, except mill finish prepared for painting where designated for field painting.
  - 2.4 Extruded Aluminum: Alloy 6063-T52; 0.078 inch minimum thicknesses for primary framing and curb member legs, 0.062 inch for secondary legs; AA-C22A41 clear anodized finish on exposed members, except as otherwise designated.
  - 2.5 Insulation: Rigid or semi-rigid board of glass fiber.
  - 2.6 Wood Nailers: Softwood lumber, pressure-treated with water-borne preservatives for above ground use, complying with AWPB LP-2; not less than 1-1/2 inches thick.
  - 2.7 Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal. Match finish of exposed fasteners with finish of material being fastened. Where removal of exterior exposed fasteners affords access to building, provide non-removable fastener heads.
  - 2.8 Gaskets: Tubular or fingered design of neoprene or polyvinyl chloride, or block design of sponge neoprene.
  - 2.9 Bituminous Coating: Fed. Spec. TT-C-494 or SSPC-Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coating.
  - 2.10 Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.
  - 2.11 Elastomeric Sealant: Type that is compatible with joint surfaces; Fed. Spec. TT-S-00227, TT-S-00230, or TT-S-001543.
  - 2.12 Roofing Cement: ASTM D 2822, asphaltic.
  - 2.13 Prefabricated Heat/Smoke Vents: Provide units that have been tested, listed, and labeled by UL (Class A) or FM, as designated. Except as otherwise designated, fabricate for 40 lbs/sq ft external loading and 20 lbs/sq ft internal loading pressure. Fabricate framing of the following materials as designated, with manufacturer's standard welded or sealed mechanical corner joints, including cap flashing:
    - a. Formed or extruded aluminum.
    - b. Zinc-coated steel.
    - c. Formed or extruded aluminum or zinc-coated steel.
  - 2.13.1 Hatch-Lid Type Units: Fabricate with single or double aluminum covers with 1 inch integral insulation and gaskets. Equip units with automatic self-lifting mechanisms and fusible links or other heat-sensitive or smoke-sensitive release devices as indicated, and with complete hardware including hold-open devices and independent manual release devices for inside and outside operation of covers.
  - 2.13.2 Fusible-Dome Type Units: Provide manufacturer's standard shrinkback/drop-out polyvinyl chloride sheet dome unit for 210 F activation; with light transmittance of 40 percent, proven 10-year weather resistance, exterior acrylic protective coating, and maximum flame spread rating of 25 (UL 723). Equip each unit with external safety grid capable of supporting 200 pound loading. Provide glazing system for easy replacement of activated domes and for drainage of condensation to exterior.
  - 2.14 Prefabricated Roof Hatches: Fabricate units as single leaf type unless otherwise directed, for 40 lbs/sq ft external loading and 20 lbs/sq ft internal loading pressure. Frame with 9-inch high integral-curb double-wall construction with 1-1/2 inch insulation, cant strips, and cap flashing, with welded or sealed mechanical corner joints. Provide double-wall cover construction with 1 inch insulation core. Equip units with complete hardware set including hold-open devices, interior padlock hasps, and both interior and exterior latch handles. Provide gasketing. Fabricate units of

Attachment 1: Specifications for the Work

following materials as designated:

- a. Aluminum sheets and extrusions.
  - b. Zinc-coated steel sheets.
  - c. Zinc-coated steel sheet curbs and aluminum covers.
  - d. Aluminum or zinc-coated steel, or in combination.
- 2.15 Louvered Penthouse Gravity Ventilators: Provide units fabricated with weatherproof aluminum extrusion louvered walls with mitered or boxed corner construction; with aluminum sheet cover and 1 inch insulation adhesively applied on underside; and with extruded aluminum base and cap flashing for mounting on curbs which are not integral with units. Equip units with manual dampers designed for operation from floor directly below ventilator unit. Equip unit with bird or insect screens as directed, located internally to discourage nesting.
- 2.16 Prefabricated Vertical-Type Gravity Ventilators: Provide units fabricated from the following materials and including the following features, as designated:
- a. Zinc-coated steel sheet, prime painted.
  - b. Aluminum sheet, prime painted.
  - c. Aluminum sheet, mill finish.
  - d. Equip with bird screens.
  - e. Equip units with dampers, with manual operation device extended to 6 ft 6 in above floor.
- 2.17 Prefabricated Curbs/Equipment Supports: Comply with loading and strength requirements designated where units support other work. Coordinate dimensions with rough-in sheets or shop drawings of equipment to be supported. Fabricate of structural quality sheet steel (ASTM A 570) that has been prepared for painting, factory-primed, and painted with 2-mil thickness of baked-on synthetic enamel, after fabrication. Fabricate with welded or sealed mechanical corner joints and with cant strips and base profile coordinated with roof insulation thickness. Except as otherwise designated or required for strength, fabricate units of minimum 14-gauge metal and to minimum height of 12 inches.
- 2.18 Curb-Set Expansion Joints: Provide extruded aluminum expansion joint units designed for installation on raised curbs. Equip with curb cap, cap flashing, and waterproof bellows of 30- or 60-mil elastic flashing sheet of neoprene, EPDM, butyl rubber, or chlorinated polyethylene. Provide mineral-fiber insulation, concealed under curb cap between curbs, to form a waterproof, airtight, insulated, expansion joint system. Provide units in styles required for roof-to-roof, roof-to-wall, and wall-to-wall applications as required; complete with prefabricated corner and intersection units as required; equipped with special field-splice provisions to ensure permanent continuous waterproof installation of expansion joint system.
- 3.0 EXECUTION: Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures. Except as otherwise designated, install roof accessory items in accordance with construction details of NRCA Roofing and Waterproofing Manual.
- 3.1 Isolation: Where metal surfaces of units are to be installed in contact with noncompatible metal or corrosive substrates, including wood, apply bituminous coating on concealed metal surfaces or provide other permanent separation.
- 3.2 Flange Seals: Except as otherwise directed, set flanges of accessory units in a thick bed of roofing cement to form a seal.
- 3.3 Cap Flashing: Where cap flashing is required as component of accessory, install to provide adequate waterproof overlap with roofing or roof flashing. Seal with thick bead of mastic sealant, except where overlap is required to be left open for ventilation.

**Plastic Skylights**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of plastic skylights. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:

Attachment 1: Specifications for the Work

- 2.1 Single thickness plastic skylights shall be formed to a standard dome profile.
- 2.2 Double thickness plastic skylights shall have an average 1-inch minimum air space between sheets formed to a standard dome profile, with a standard hermetic edge seal.
- 2.3 Color: Exterior sheets shall be colorless transparent sheet or bronze tinted transparent sheet, 25-30 percent light transmittance in accordance with ASTM D 1003. Interior sheets shall be colorless transparent sheet.
- 2.4 Glazing frame, dome retainers, and trim shall be extruded aluminum.
- 2.5 Curb frame shall be extruded aluminum including cap flashing to receive roofing counterflashing.
  - 2.5.1 Curb-mounted units shall be designed for installation on nominal 1-1/2 inch thick wood curbs.
  - 2.5.2 Insulated curb units shall be self-flashing units with integral, self-supporting double wall formed or extruded or combination aluminum curb 0.040-inch minimum sheet thickness enclosing minimum 1-inch glass fiberboard or equivalent insulation and with minimum 3-inch roof flanges; welded or sealed mechanical joints at corners.
  - 2.5.3 Curb height shall be 9 inches minimum above line of roofing or custom height as required. For decks that slope 1/4 inch per ft., tapered curb heights shall match slope to provide a level installation of domes.
- 2.6 Glazing systems of neoprene, closed cell sponge neoprene, PVC gasketing, partially vulcanized butyl tape, or liquid-applied elastomeric sealant shall be provided.
- 2.7 Condensation control on inside of domes shall be provided using fabricated units with integral internal gutters and nonclogging weeps.
- 2.8 Plastic for skylights shall be cast acrylic with abrasion-resistant coating on exterior surface, for 2 percent maximum haze increase of 100 revolutions on 500 g Taber abraser in accordance with ASTM D 1044; 14,500 psi flexural strength; 180 F continuous service temperature or cast polycarbonate with 13,500 psi flexural strength; 240 F continuous service temperature; 16 ft-lb IZOD impact strength. Skylights shall meet AAMA 1601.1 recommendations for thickness of plastic domes to maintain 40 psf loading (for support of ice and snow only).
- 2.9 Bituminous coating shall be in accordance with Fed. Spec. TT-C-494 solvent type bituminous mastic, nominally free of sulphur, compounded for 15-mil dry film thickness per coating.
- 2.10 Roofing cement shall be asphaltic complying with ASTM D 2822.
- 2.11 Mastic sealant shall be polyisobutylene; non-hardening, non-skinning, non-drying, non-migrating sealant.
- 3.0 EXECUTION:
  - 3.1 Installation of skylights shall be coordinated with installation of roof deck or other substrates and with vapor barriers, roof insulation, roofing, and flashing as required to ensure that combined elements are waterproof and weathertight. Units shall be anchored securely to supporting structural substrates to withstand lateral and thermal stresses including inward and outward loading pressures.
  - 3.2 Isolation: Where metal surfaces of units are required to be installed in contact with noncompatible metal or corrosive substrates, including wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation.
  - 3.3 Flange Seals: Where required, set flanges of accessory units in a thick bed of roofing cement to form a seal.
  - 3.4 Cap Flashing: Where cap flashing is required, install to provide adequate waterproofing overlap with roofing or roof flashing (as counter flashing). Seal with thick bead of mastic sealant, except where overlap is indicated to be left open for ventilation.
  - 3.5 Cleaning: Clean exposed metal and plastic surfaces.

**Metal-framed Skylights**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of metal-framed skylights. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:

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- 2.1 Metal-framed skylight panels shall be 2-1/4 inch thick double-faced panels consisting of glass fiber reinforced polymer, with interior and exterior faces bonded under controlled heat and pressure to a mechanically interlocked aluminum grid core. Exterior face shall have a special erosion protective surfacing.
  - 2.1.1 Panel Performance Characteristics:
    - 2.1.1.1 Color Stability from Weathering: Exterior face shall not change more than 3.5 adams units (Delta E by ASTM D 2244) as determined by an average of three samples after a minimum of outdoor exposure of 60 months in south Florida at 7 degrees facing south.
    - 2.1.1.2 Interior fire resistance characteristics shall be in accordance with ASTM E 84, with flame spread of 45 maximum and a smoke developed rating of 350 maximum. Burn extent shall be 1 inch or less by ASTM D 635.
    - 2.1.1.3 Exterior face impact resistance shall be 60 ft-lb minimum.
    - 2.1.1.4 Coefficient of linear expansion shall be  $1.24 \times 10^{-5}$  in./in./F.
  - 2.1.2 Laminate adhesive shall be heat and pressure resin type. Minimum strength shall be 750 psi tensile strength by ASTM C 297 after two exposures to six cycles each of aging conditions prescribed by ASTM D 1037 and 500 psi shear strength average by ASTM D 1002 after five prescribed exposures.
  - 2.1.3 Grid Core shall be 6063-T6 aluminum I-beams with 7/16-inch flange width, mechanically interlocked to ensure even muntin to muntin intersection.
  - 2.1.4 Aluminum frame shall be 6063-T5 aluminum with mill finish or corrosion-resistant finish as required with mitered and heli-arc welded corners. Clamp fasteners shall be stainless steel.
  - 2.1.5 Panel U-values determined by ASTM C 236 shall be as designated.
- 2.2 Pre-engineered self-supporting roof systems shall be one of the following standard types as required:
  - 2.2.1 Continuous vaulted type shall be semi-circular.
  - 2.2.2 Pyramid type shall be self-supporting.
  - 2.2.3 Grid type shall be 4-foot minimum width by 16-foot maximum length as required.
  - 2.2.4 Preformed Acrylic
  - 2.2.5 Structural roof design loads shall be based on location of installation. Joint and structural systems shall be manufacturer's standard types or special designed systems as required. Roof systems shall be fastened to supports as recommended by the roof system manufacturer.
  - 2.2.6 Flashings shall be aluminum, 0.040 inch thick minimum.
- 2.3 Optional face sheet material for metal-framed skylight panels shall be 1/8-inch thick clear acrylic panels assembled in accordance with manufacturer's recommendations. Panel assemblies shall be limited to 4-foot by 4-foot modules composed of 12 inches by 24 inches or 8 inches by 20 inches nominal grid size as required.
- 2.4 Panels may be 1-9/16 inch thickness where required.
- 3.0 EXECUTION: (Section not used.)

**Sealants**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of sealants. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Oil-Based Caulking Compound shall conform to Fed. Spec. TT-C-00598, Type I.
  - 2.2 Two-component polyurethane sealant shall be an elastomeric type compound conforming to Fed. Spec. TT-S-00227, Type II, Class A or B as required. The compound shall be supplied in pre-measured kit form for on-the-job mixing.
  - 2.3 Butyl rubber sealant shall conform to Fed. Spec. TT-S-001657, Type I or II as required.
  - 2.4 Single-component polysulfide sealant shall be an elastomeric type compound conforming to Fed. Spec. TT-S-00230, Type II, Class A or B as required.
  - 2.5 Polyisobutylene-Based or Isoprene-Isobutylene-Based Pressure-Sensitive Tape or Bead: When applied between two clean, dry surfaces of specified thicknesses and under conditions of continuous pressure that will be encountered in use, the sealant shall seal the joint from water and

Attachment 1: Specifications for the Work

- shall be weather-resistant. The material shall be nonbleeding at 160 F and below, shall withstand temperature ranges from minus 30 F to 200 F without loss of adhesion and without slipping, and shall have properties allowing the compound to move with the expansion and contraction of structure. The tape or bead shall be plain or contain a cloth or fiber insert. The tape or bead shall be supplied in rolls with a removable paper for cloth backing.
- 2.6 Silicone rubber based sealant shall be an elastomeric type compound conforming to TT-S-001543, Class A or B as required.
  - 2.7 Preformed Strip Sealants:
    - 2.7.1 Preformed butylene strip sealant shall be foamed-urethane strip saturated with a butylene waterproofing material.
    - 2.7.2 Preformed asphalt impregnated strip shall be asphalt-impregnated foamed-polyurethane strip.
  - 2.8 Acoustical Sealant: Synthetic rubber or polymeric-based material shall conform to the following:
    - 2.8.1 Consistency: ASTM D 217, 190 to 310.
    - 2.8.2 Aging: Slightly tacky at 160 F after 50 days.
    - 2.8.3 Accelerated Aging: No significant change after 260 hours in weathermeter.
    - 2.8.4 Nonstaining.
    - 2.8.5 Solids Content: Approximately 80 to 90 percent.
    - 2.8.6 No Oil Migration.
  - 2.9 Silicone RTV foam firestop sealant shall be a medium-density two-part product supplied as liquid components. When components are thoroughly mixed in a one-to-one ratio by either weight or volume the sealant shall expand and cure to a foamed elastomer at room temperature in 1 to 3 minutes. Sealants for fire-rated penetration seal designs shall bear UL classification for 1, 2, or 3-hour fire-rating, as required to match rating of the penetrated construction.
  - 2.10 Sealer: Sealer for use with oil-based caulking compound shall be aluminum paint.
  - 2.11 Primer: Primer for two-component polyurethane sealant, butyl rubber sealant, and single-component polysulfide sealant shall be as recommended by the sealant manufacturer. Primer shall have been tested for durability with the sealant to be used and on samples of the surfaces to be sealed.
  - 2.12 Backstop Material: Backstop material shall be resilient urethane or polyvinyl-chloride foam, closed-cell polyethylene foam, closed-cell sponge of vinyl or rubber, polychloroprene tubes or beads, polyisobutylene extrusions, preformed neoprene, neoprene rod, oilless dry jute, or rope yard. Backstop material shall be nonabsorbent, nonstaining, and compatible with the sealant used. Tube or rod stock shall be rolled into the joint cavity. Preformed support strips for ceramic and quarry tile control joint and expansion joint work shall be polyisobutylene or polychloroprene rubber.
  - 2.13 Bond-preventive materials shall be pressure-sensitive adhesive polyethylene tape, aluminum foil, or wax paper. Backstop material with bond-breaking characteristics may be installed in lieu of bond-preventive materials specified.
  - 3.0 EXECUTION:
    - 3.1 General Surface Preparation: The surfaces of joints to be sealed shall be dry. Oil, grease, dirt, chalk, particles of mortar, dust, loose rust, loose mill scale, and other foreign substances shall be removed from all joint surfaces to be sealed. Oil and grease shall be removed with solvent and surfaces shall be wiped with clean cloths.
    - 3.2 Concrete and Masonry Surfaces: Where surfaces have been treated with curing compounds, oil, or other such materials, the materials shall be removed by sandblasting or wire brushing. Laitance, efflorescence, and loose mortar shall be removed from the joint cavity.
    - 3.3 Steel Surfaces: Steel surfaces to be in contact with sealant shall be sandblasted or, if sandblasting would not be practical or would damage adjacent finish work, the metal shall be scraped and wire brushed to remove loose mill scale. Protective coatings on steel surfaces shall be removed by sandblasting or by a solvent that leaves no residue.
    - 3.4 Aluminum Surfaces: Aluminum surfaces of windows and door frames in contact with sealants shall be cleaned of temporary protective coatings. When masking tape is used for a protective cover, the tape and any residual adhesive shall be removed just prior to applying the sealant. Solvents used to remove protective coatings shall be as recommended by the manufacturer of the aluminum work and shall be nonstaining.

**DIVISION 8-OPENINGS**

**Hollow Metal Doors and Frames**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of hollow metal doors and frames. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 General: All hollow metal doors and frames shall comply with Recommended Specifications: Standard Steel Doors and Frames (SDI-100), Steel Door Institute.
  - 2.2 Hollow Metal Doors: Doors shall be SDI-100 standard types, styles, and sizes as designated. Doors shall be reinforced to receive builder's hardware in compliance with the requirements of ANSI A115. Provide glazing beads and stops for glass panels and sightproof louvers as required. Doors shall be galvanized. Doors to be field-finished shall receive a shop prime coat. A baked-on finish coat shall be provided for factory-finished doors.
  - 2.3 Hollow Metal Frames: Hollow metal frames for doors, transoms, side lights, borrowed lights, and other openings shall be SDI-100 standard types, styles, and sizes as designated. Frames shall be provided with mitered corners and welded construction for exterior applications and knocked down for field assembly for interior applications. Frames shall be reinforced to receive builder's hardware in compliance with the requirements of ANSI A115. Provide plaster guards or mortar boxes where required. Finish shall be as specified for doors.
  - 2.4 Fire-Rated Assemblies: Fire doors and frames shall be identified with recognized testing laboratory labels indicating the applicable fire rating. The constructed and installed assemblies shall comply with the requirements of NFPA 80.
  - 2.5 Soundproofing Metal Doors: Soundproofing metal doors shall be identified with recognized testing laboratory labels indicating the applicable STC soundproofing rating. Soundproofing rating shall be STC 45 or as required.
  - 2.6 Hollow Metal Combination Storm and Screen Doors: Doors shall be flush foam insulated panels capable of receiving removable screen or glass inserts. Doors shall be not less than 20-gauge steel, minimum 1-3/8 inch thick, and minimum 3-1/2 inch stiles and rails. Screen insert shall be aluminum wire-cloth screening. Glazing shall be 1/4 inch thickness. Doors shall be reinforced to receive, and shall be provided with a spring-loaded chain door stop, a latch with a night lock, a hydraulic closer, 1-1/2 pair butts, door pull, and an adjustable sweep with a vinyl seal. Doors shall be finished as specified for hollow metal doors.
- 3.0 EXECUTION:
  - 3.1 Frame Installation: Installation of frames shall comply with the provisions of SDI-105, Recommended Erection Instructions for Steel Frames. Provide three wall anchors per jamb at hinge and strike levels. Fire-rated frames shall be installed in compliance with NFPA 80.
  - 3.2 Door Installation: Hollow metal doors shall be fit accurately in frames within clearances specified in SDI-100. Fire-rated doors shall be installed within clearances specified in NFPA 80.
  - 3.3 Soundproofing Metal Door and Frame:
    - 3.3.1 Frames shall be set plumb and true and fully insulated. The floor under the sill, if poured, shall be level and smooth.

**Aluminum Doors and Frames**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of hinged aluminum doors and frames. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Glazed aluminum stile-and-rail doors and frames shall be manufacturer's standard type. Adjacent

Attachment 1: Specifications for the Work

- glass enclosures, transoms, and/or sidelights shall be of the same style and design as the doors and frames.
- 2.1.1 Screws, nuts, washers, rivets, and other miscellaneous fastening devices shall be of hardened aluminum, stainless steel, or other corrosion-resistant material.
  - 2.1.2 Nominal wall thickness for doors shall be not less than 0.125 inch except that the molding shall be not less than 0.05 inch.
  - 2.1.3 Frames shall be extruded tube or open channel shapes not less than 0.125 inch thick for frames 1-3/4 inches by 4 inches and not less than 0.093 inch thick for frames 1-3/4 inches by 4-1/2 inches. Doors shall have extruded aluminum snap-in glass stops with vinyl insert.
  - 2.2 Flush Aluminum Doors:
    - 2.2.1 Doors shall be constructed of tubular frame members, fabricated with reinforced mechanical or welded joints. Limit frame exposure to 3/4 inch maximum width on door faces.
    - 2.2.2 Core shall be resin-impregnated Kraft paper with honeycomb, rigid closed-cell polyurethane insulation, or rigid noncombustible mineral insulation board.
    - 2.2.3 Faces shall be of aluminum sheet of 0.064-inch minimum thickness, mechanically interlocked with frame members or laminated to core and framing with waterproof glue to form door thickness of 1-3/4 inches.
    - 2.2.4 Lights (glazed openings in doors) shall have aluminum moldings and stops, with inside removable stops.
    - 2.2.5 Frames shall be of tubular and channel frame assemblies, with either welded or mechanical joints, reinforced as necessary to support required loads and door hardware.
  - 2.3 Aluminum combination storm and screen doors: Doors shall consist of a master frame with two intermediate horizontal rails, one fixed metal panel, and two glass and two screen removable insert panels. Master frame shall be a minimum 1 inch thick and stiles shall be a minimum 2-3/4 inches wide. Doors shall have a mill finish and shall be provided with a springloaded chain door stop, a latch with a night lock, a hydraulic closer, and an adjustable door sweep with a vinyl seal. Screen inserts shall have aluminum wirecloth screening secured with a vinyl spline.
  - 2.4 Weatherstripping: Weatherstripping shall be door manufacturer's standard applied to stiles, heads, and bottoms of exterior doors and shall be easily replaced without special tools.
  - 2.5 Finishes: Aluminum surfaces shall be provided with one of the following finishes. The coating shall have a minimum film thickness of 0.0004 inch with a minimum weight of 17 milligrams per square inch when tested in accordance with ASTM B 137. Coating shall be sealed with hot water.
    - 2.5.1 Anodic Coating (0.4 mil to 0.7 mil): AA-M12-C22-A31, Architectural Class II, Clear-Anodized or AA-M12-C22-A32, AA-M12-C22-A34, Architectural Class II, Color-Anodized.
    - 2.5.2 Organic Coating (minimum 0.8 mil): AAMA 603.8, Baked-Enamel finish.
  - 2.6 Special Finishes:
    - 2.6.1 Anodic Coating (minimum 0.7 mil): AA-M12-C22-A41, AA-M12-C22-A42, or AA-M12-C22-A44, Architectural Class I, Color-Anodized.
    - 2.6.2 Organic Coating (minimum 1.2 mil): AAMA 605.2, High-Performance finish.
  - 3.0 EXECUTION: Aluminum surfaces in contact with dissimilar materials shall be backpainted with alkali-resistant paint before erection.

**Wood Doors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of wood doors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 General: Top and bottom edges of doors shall be sealed prior to shipment. Each door shall bear a stamp, brand, or other identifying mark indicating quality and construction of the door.
  - 2.2 Flush Doors: Solid core and hollow core flush doors shall conform to NWWDA I.S.1. For stain or natural finish, doors shall be of Good Grade veneer in accordance with NWWDA I.S.1. For paint finish, doors shall be Standard Grade in accordance with NWWDA I.S.5 or Sound Grade or hardboard-faced in accordance with NWWDA I.S.1. Unless otherwise required for fire safety, solid

Attachment 1: Specifications for the Work

- core doors shall have wood block core or mat-formed particleboard core conforming to NWWDA I.S.1. Hollow core and mat-formed particleboard solid core doors shall have lock blocks. Openings in exterior doors shall be weatherproof.
- 2.3 Paneled doors shall conform to NWWDA I.S.5 or FHDA/7. For stain or natural finish, doors shall be Premium Grade in accordance with NWWDA I.S.5 or Selected Grade in accordance with FHDA/7. For paint finish, doors shall be Standard Grade in accordance with NWWDA I.S.5. When laminated panels are furnished, they shall not be less than three ply. Flat panels shall have a minimum finished panel thickness of 5/8 inch. Raised panels shall have a minimum finished panel thickness of 3/4 inch.
  - 2.4 Fire Doors: Fire doors shall be constructed of materials and in a manner that will conform to the requirements of Underwriters' Laboratories. Doors shall bear the identifying label of Underwriters' Laboratories for the desired resistance rating.
  - 2.5 Storm doors shall be manufacturer's standard solid core door not less than 1-3/4 inches thick with 5-inch minimum stiles and top rail. Upper panel shall be arranged to receive removable glass and screen inserts. Screen insert shall be aluminum wire-cloth screening. Glazing shall be 1/4 inch thickness. Door shall be provided with 1-1/2 pair butts, a latchset with a night lock, a spring-loaded chain door stop, a hydraulic closer, and an adjustable door sweep with a vinyl seal.
  - 2.6 Screen doors shall be manufacturer's standard solid wood door not less than 1-3/8 inch thick with 3-1/2 inch minimum stiles, mid-rail and top rail, and 7-1/2 inch bottom rail. Screen shall be aluminum wire-cloth screening secured with wood stops and vinyl splines. Doors shall be provided with 1 pair butts, 1 pull, 1 hook and eye, and 1 spring closer.
  - 2.7 Preservative Treatment: Exterior softwood doors shall be water-repellent preservative treated and so marked at the plant in accordance with NWWDA I.S.4.
  - 2.8 Adhesives: Adhesives shall be in accordance with NWWDA I.S.1, using requirements for Type I doors for exterior doors and requirements for Type II doors for interior doors. Adhesive for doors to receive a natural finish shall be nonstaining.
  - 2.9 Accessories: All doors shall have cutouts, stops, beads, or other accessories as required to receive builder's hardware, glazing, louvers, or other design specialties and penetrations.
  - 3.0 EXECUTION: Installation and operation characteristics of fire doors shall conform to NFPA 80, 80A, and 101.

**Aluminum and Wood Sliding Glass Doors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of sliding glass doors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Aluminum sliding glass doors shall be complete units with safety glass, weatherstripping, hardware, and integral tracks and rollers for smooth operation and installation. Sliding glass door panels shall conform to AAMA 101. Classification of sliding glass doors shall be AAMA type SGD-A3 (monumental grade) provided for high performance (HP) designation.
  - 2.2 Wood sliding glass doors shall consist of wood frame sliding and fixed safety glass panels and casings of selected West Coast hardwood treated with water repellent and factory-primed for exposed wood exterior frame parts and door panels. Sill facing shall be extruded anodized aluminum with PVC thermal barrier. Operating door track shall have stainless steel cap. Each unit shall include door panels, head and sill, track rollers (ball-bearing sheaves), weatherstripping, glazing channels, hardware, and accessories.
  - 2.3 Hardware shall include door pulls and keyless locking with interior locking lever on operating door panel.
  - 2.4 Glazing in door panels shall be safety glass in compliance with ANSI Z97.1.
  - 2.5 Screen doors shall be manufacturer's standard furnished with sliding doors. Insect screen shall be 18 x 16 mesh aluminum wire conforming to Fed. Spec. RR-W-365 or glass fiber screen conforming to Fed. Spec. L-S-125.

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- 3.0 EXECUTION: Installation of door units shall be complete with all necessary anchors, inserts, and hardware.

**Sliding Fire Doors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of sliding fire doors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Composite sliding fire doors shall be standard steel face sheets bonded to and supported by rigid, dimensionally stable inorganic core, with steel reinforced edges. Finish shall be factory-primed.
- 2.2 Hollow metal (sheet metal) sliding fire doors shall be standard flush design with not less than 20-gauge steel faces over steel stiffeners or honeycomb core materials. Finish shall be factory-primed.
- 2.3 Tin-clad sliding fire doors shall be standard design wooden core construction with 14-inch by 20-inch maximum size, 30-gauge galvanized steel sheets not over 48 inches wide with venting as required by NFPA 80. Finish shall be galvanized.
- 2.4 Horizontal sliding steel doors shall be standard design consisting of two thicknesses of 24-gauge galvanized corrugated sheet steel with an asbestos core and framed with galvanized structural steel shapes. Sheets shall be applied with exposed face corrugations vertical and wall side corrugations horizontal. Finish shall be galvanized.
- 2.5 Vertical lift sliding steel doors shall be standard design consisting of two thickness of 24-gauge galvanized corrugated sheet steel with an asbestos core and framed with galvanized structural steel shapes. Sheets shall be applied with exposed face corrugations vertical and wall side corrugations horizontal. Door shall be uprising on vertical tracks. Finish shall be galvanized.
- 2.6 Metal-clad (Kalamein) doors shall be standard horizontal sliding metal covered wood core or stiles and rails and insulated flush panels covered with steel. Finish shall be factory-primed.
- 2.7 Fire door assemblies shall be provided as complete units produced by one manufacturer.
- 2.7.1 Fire doors, frames, and fire door hardware shall be types that have been fire-tested and rated in accordance with ASTM E 152. Doors shall bear labels of the Underwriters' Laboratories, Incorporated or Factory Mutual Laboratories as evidence of rating.
- 2.7.2 Components for rated door assembly shall be listed in UL Building Materials Directory or Factory Mutual Approval Guide.
- 2.8 Finish: Galvanized finish shall be hot-dip galvanized minimum 0.6 ounce per square foot and shall not be factory-primed.
- 2.9 Fire Door Hardware: Hardware shall be labeled, automatic closing type sliding fire door assemblies complete with adjustable roller guides, binders, floor stops, cables, sheaves, counterweight, and fusible links. Fusible links shall be UL listed, 165 F for ordinary temperature classification.
- 2.10 Accessories: The following items shall conform to the requirements of NFPA 80: Astragal, chafing strips, bumper shoes, rear binder, stay rolls, wedge, and automatic closer.
- 3.0 EXECUTION:
- 3.1 Installation: Fire doors shall be installed in accordance with NFPA 80.
- 3.2 Temporary Fire Protection: During the execution of this work, temporary fire barriers, alarms, or watchmen shall be provided to the degree of opening protection required by the local authority until the permanent work is completed and operational.

**Coiling (Rolling) Doors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of coiling doors, coiling grilles, and coiling counter shutters. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Doors shall be the manufacturer's standard type. Doors shall be spring counterbalanced, overhead coiling type; coiling grilles shall be overhead or side coiling type. Door

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- shall be complete with all guides, tracks, hardware, fastenings, operating mechanisms, and accessories. Guides at jambs shall be set back a sufficient distance to provide a clear opening when doors are in the open position.
- 2.1 Roller Shaft: The roller shaft shall be constructed of steel pipe or commercial welded steel tubing of proper diameter and thickness for the size of the curtain. Deflection shall not exceed 0.03 inch per foot of span. Ends of roller shall be closed with cast-iron plugs, machined to fit the pipe. An oil-tempered, helical, counter-balancing steel spring, capable of producing sufficient torque to ensure easy operation of the door curtain from any position, shall be installed within the roller. Spring shall be easily adjustable.
  - 2.2 Brackets: Brackets shall be fabricated of heavy cast iron or steel, designed to close the ends of roller-shaft housing and to form a supporting ring for hood. The bracket hubs or shaft plugs shall be equipped with prelubricated ball bearings, shielded or sealed.
  - 2.3 Hoods: Each hood shall be constructed of steel not lighter than No. 24-gauge, formed to fit the contour of end bracket gear assembly and reinforced with steel rods or rolled beads at top and bottom edges. A weather baffle shall be provided at the lintel.
  - 2.4 Gears: Gears shall be of the best grade gray iron, cast iron teeth machine-molded from machine-cut patterns, enclosed and protected by the hood and brackets.
  - 2.5 Guides: The guides shall consist of steel shapes not less than 2-1/2 inches deep and not less than 3/16-inch thick and shall form a channel pocket of sufficient depth to retain the curtain in place under the wind pressure specified. Provisions for removal of the door shall be included in the design.
  - 2.6 Head Track: Head track for side coiling grilles shall be of extruded aluminum and shall be provided with adjustable hangers spaced not more than 2 feet-6 inches on center.
  - 2.7 Floor Track: Floor track for side coiling grilles shall be of extruded aluminum with replaceable bronze strips, flush with finish floor and shall provide a floor slot with a maximum width of 1/4 inch.
  - 2.8 Bottom Rail: The curtain shall have a rolled-steel bottom bar consisting of two angles of equal weight, one on each side, fastened to the bottom of the curtain.
  - 2.9 Endlocks and Windlocks: The ends of each slat shall have malleable iron endlocks of the manufacturer's standard design. The door shall have windlocks at the ends of each slat. Windlocks shall prevent curtain from leaving the guide as a result of deflection from wind pressure or other forces.
  - 2.10 Weatherstripping: Doors exposed to weather shall have manufacturer's standard weatherstripping on jambs, top, and sill for weathertight installation.
  - 2.11 Curtains:
    - 2.11.1 Curtains for coiling service doors shall be formed of insulated interlocking galvanized steel slats of No. 20- gauge minimum thickness or of flat steel interlocking slats. The curtains shall be designed to resist designated wind pressure without damage. The curtains shall roll up on a drum supported at the head of the opening on brackets and be balanced by helical springs.
    - 2.11.2 Curtains for coiling grilles shall consist of 5/16-inch diameter mill finish aluminum, galvanized steel, or stainless steel rods spaced 2 inches on center to form brick pattern grille, with interlocking links to form a network of vertical and horizontal lines. Links shall be 9 inches apart.
  - 2.12 Counter Doors (Roll-Up Shutters): Integral counter shutter/frame shall be manufacturer's standard. Curtains shall be aluminum, minimum 22-gauge galvanized steel, or stainless steel, minimum 22-gauge Type 302 No. 4 finish as designated. Frame shall be fully welded into a single assembly, complete with anchors; the jambs and head shall be minimum 16-gauge stainless steel or plain steel, and the sill shall be formed of 14-gauge stainless steel No. 4 finish.
  - 2.13 Fire Doors: Doors, frames, hardware, and other accessories shall be in accordance with NFPA 80.
  - 2.14 Operation:
    - 2.14.1 Push-Up Operation: Doors shall have one lifting handle on each side of the door and shall be counter balanced to provide ease of operation while raising or lowering the curtain by hand. The maximum exertion or pull required shall not exceed 25 pounds. Doors over 7 feet high shall be provided with pull down straps or pole hooks.
    - 2.14.2 Chain-Gear Operation: Chain shall be galvanized, endless type, operating over a sprocket and shall extend to within 3 feet of floor. Gears shall be high grade gray iron, cast from machine-cut

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- patterns. Gear reduction shall be calculated to reduce chain pull required to not exceed 35 pounds.
- 2.14.3 Crank-Gear Operation: Crank shall be removable and located approximately 34 inches above the floor. Gears shall be of high grade gray iron, cast from machine-cut patterns. Gear reduction shall be calculated to reduce pressure exerted on crank to not over 35 pounds.
  - 2.14.4 Motorized Operation: Electric power-operated doors shall be complete with electric motors, operators, controls, switches, and safety devices. Control equipment shall comply with NEMA ICS 2.
  - 2.15 Finish:
    - 2.15.1 Galvanizing: Curtain and bottom rail shall be hot-dipped galvanized with a zinc coating not less than 1.25 ounces total per square foot of flat metal, coating class 1.25 in accordance with ASTM A 525. Hood shall have either class 1.25 galvanizing as described above or be fabricated from electrolytic zinc-coated sheets conforming to ASTM A 591. Hardware items shall be galvanized according to ASTM A 153. Items galvanized after assembly shall comply with ASTM A 123.
    - 2.15.2 Pretreatment: All zinc-coated surfaces shall be given a phosphate coating prior to application of prime paint.
    - 2.15.3 Shop-Applied Prime Paint: All ferrous surfaces, including galvanized curtain, hood, and slats, but excluding wearing surfaces, shall be given one shop-applied prime coat of the manufacturer's standard primer in accordance with Fed. Spec. TT-P-86. Primer shall be compatible with the specified finish paint and shall not contain lead. Non-galvanized surfaces shall be wire brushed to bare metal prior to primer application.
  - 3.0 EXECUTION: Guides shall be securely attached to adjoining construction. Doors shall be installed with all anchors and inserts for brackets, tracks, hardware, and other accessories located accurately. Upon completion, door shall be weathertight and shall be lubricated and adjusted to operate freely.

**Folding Doors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of folding doors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Door shall be full pantograph or "x-accordion" type with flexible fabric panels. Materials shall have a flame spread rating of 25 or less, fuel contributed rating of 10 or less, and a smoke developed rating of 5 or less, in compliance with ASTM E 84. Each new door unit shall be a complete unit produced by one manufacturer including hardware, accessories, mounting, and installation components.
  - 2.2 Framework for door including posts, pantographs, hinges and hinge plates, and support rods shall be ferrous metal. All enclosed metal shall be galvanized ASTM B 633, or cadmium-plated ASTM B 766. Posts and exposed metal items shall have phosphate treatment complying with Fed. Spec. TT-C-490.
  - 2.3 Folding Mechanism:
    - 2.3.1 Flexible panels shall be fabricated with not less than 16-gauge metal. Provide one row at top for doors up to 12 feet high, two rows at top for doors over 12 feet high, single row at bottom, and intermediate rows not over 4 feet center to center. Provide vertical rods of a minimum 3/16-inch diameter for connecting hinges in non-rigid type panels.
    - 2.3.2 Rigid panels shall be fabricated with not less than 14-gauge metal, pantograph top and bottom.
  - 2.4 Lead Posts and Jamb Posts shall be fabricated of not less than 16-gauge steel ASTM A 525 for doors up to 10 feet high and not less than 14-gauge for doors over 10 feet high.
  - 2.5 Carriers: Carriers shall be nylon, ball-bearing, wheeled type.
  - 2.6 Door Covering: Covering shall be attached to frame in a manner that will permit onsite removal and repair. Covering shall be treated to be flame-resistant and shall not peel, craze, crack, or fade. Fabric covering shall be vinyl-coated fabric complying with Fed. Spec. CCC-W-408, 30 ounces per linear yard, 54 inches wide.
  - 2.7 Acoustical-rated door shall be manufacturer's standard construction complying with ASTM E 90 to provide a STC rating of 40. Door assembly shall include perimeter seal sweep strips for each side,

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- top, and bottom, and sound liner of door manufacturer's standard for door panels. Door shall have light and sound seal at door lead posts and jamb posts.
- 2.8 Track: Track shall be steel with factory-applied corrosion-resistant finish. Track shall be recess mounted with necessary sub-channel or trim units to form pocket for ceiling mounting. Sections shall be provided in the maximum lengths practicable.
- 2.9 Accessories shall be provided as follows: Center stop for bi-parting doors, track switches for door operation, and ceiling contact guard for sound-rated door units.
- 2.10 Hardware:
- 2.10.1 Components shall be heavy-duty metal pulls and latches of brass or steel with dull chromium-plated finish.
- 2.10.2 Latch shall be operable from both sides of closed door.
- 2.10.3 Deadlock shall be provided to receive cylinder, operable from both sides.
- 2.10.4 Miscellaneous Items shall be provided as follows: pendant pull in lead post, upper draw latch with grip handle, center molding or strike for bi-parting door, and foot bolts on lead post.
- 3.0 EXECUTION: (Section not used.)

**Accordion Folding Doors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of accordion folding doors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Vinyl Covering: Fed. Spec. CCC-W-408, Type II or III, wood grain or textured.
- 2.2 Plastic Laminate: NEMA LD 3, 1/16-inch minimum thickness, wood grain, patterned, or solid color finish.
- 2.3 Wood Veneer: Good grade, premium grade, or book matched hardwood, as designated.
- 2.4 Framework including posts, pantographs, hinges, hinge plates, and support rods shall be either extruded aluminum or ferrous metal. Ferrous metal shall be either cadmium-plated or zinc-coated, except posts at the option of the door manufacturer shall have phosphate treatment and manufacturer's shop finish paint.
- 2.5 Pantographs: The frames on doors requiring pantographs shall be arranged for horizontal pantograph action with pantographs located at top and bottom of the frame. Intermediate pantographs spaced not over 4 feet center-to-center shall be provided for doors more than 8 feet in height. An intermediate pantograph shall be provided at the center of doors less than 8 feet high unless the door has vertical metal reinforcing. The pantographs shall operate smoothly with positive folding action and shall have a control device to prevent flattening of the folds when the panel is fully extended.
- 2.6 Hardware: Units shall be complete with grip handles, a positive latching system, and an upper latch with extended pulls if unit is over 11 feet high. Hardware shall be anodized aluminum with a natural finish or chrome plated brass.
- 2.7 Sweep strips shall be vinyl or other material that will not crack or craze with severe usage.
- 2.8 Track shall be recessed or surface-mounted and of extruded aluminum or enamel finish steel, not less than 16-gauge steel or 14-gauge aluminum. Track sections shall be provided in the maximum lengths practicable, not less than 6 feet long except for narrow doors and at ends of runs where short length is required. Suitable joint devices such as interlocking keys shall be provided at each joint to provide permanent alignment of track.
- 2.9 Metal soffit shall be provided when track is recessed. Soffit shall be of metal of adequate thickness to protect the ceiling from damage by door operation and shall be provided with the door manufacturer's standard neutral-color applied finish. Soffits may be integral elements of ceiling track.
- 2.10 Fire Hazard Classification: Vinyl coverings, plastic laminates, and wood veneers shall have a fire hazard classification as determined by ASTM E 84. Provide materials with the following fire hazard classifications: Flame spread not more than 25. Smoke developed not more than 50.

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3.0 EXECUTION: (Section not used.)

**Flexible Doors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of flexible doors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 General: Each new door unit shall be a complete unit produced by one manufacturer including hardware, accessories, mounting, and installation components.
  - 2.2 Door Panels: Door panels shall be constructed of the following materials.
    - 2.2.1 Heavy-Duty, Abrasive-Resistant Rubber, 60 durometer, roto-cured process, 2,200 psi tensile strength. Panel thickness shall be 1/2 inch.
    - 2.2.2 Flexible Polycarbonate transparent panels 1/2 inch thick.
    - 2.2.3 Flexible Polyvinylchloride (PVC) transparent panels 0.196 inch (5mm) thick.
    - 2.2.4 Flexible Polyvinylchloride (PVC) opaque panels 0.196 inch (5mm) thick.
  - 2.3 Door Panels shall be single or double-acting, as required.
  - 2.4 Panel Frame: Framing materials to which door panels shall be secured shall be galvanized steel, ASTM A 525, 11 gauge. Door panels shall be suspended between L-shaped rolled formed rails and stiles by removable bolt and nut connectors.
  - 2.5 Hardware shall conform to the requirements of ASTM B 633, ASTM B 766, or ASTM A 123, as required.
    - 2.5.1 Hinges shall be adjustable spring-type gravity self-lubricating hinges.
    - 2.5.2 Magnetic catch shall be provided at door overlap at pair of door panels to give positive closure.
    - 2.5.3 Header and jamb seals shall be door mounted PVC seals at head and jamb.
    - 2.5.4 Bumpers shall be center or bottom bumpers.
    - 2.5.5 Jamb guards shall be formed steel guards to enclose and protect lower hinge hardware and closures.
  - 2.6 Door jamb shall be constructed of steel tube, ASTM A 500, with integral wall anchors, galvanized in compliance with ASTM A 386 or stainless steel bent plate, Type 304, with integral wall anchors, as required.
  - 2.7 Finish: All ferrous metal parts shall be finish-coated with polyurethane paint.
  - 2.8 Fire Hazard Classification: All door panel materials shall have a fire hazard classification as determined by ASTM E 84. Provide materials with the following fire hazard classifications: Flame spread not more than 25. Smoke developed not more than 50.
- 3.0 EXECUTION: (Section not used.)

**Overhead Doors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of overhead doors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Doors shall conform to the requirements of NAGDM 102 and shall be metal or wood overhead or vertical lift sectional type flush panel doors as indicated or required and shall be the products of a recognized manufacturer of the doors and accessories specified.
  - 2.2 Door assemblies shall be furnished with operating mechanisms, tracks, hardware, and all other necessary accessories required for complete installation and perfect operation.
  - 2.3 Exterior doors shall be metal sandwich construction filled with foamed-in-place insulation of sufficient density to attain the designated U-value or R-value. Doors shall have flexible neoprene weatherstripping at jambs, top, and sill.
  - 2.4 Door locks where required shall be five-pin cylinder locks and locking devices and shall be keyed as directed. Chain operators shall have standard devices for securing chain.

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- 2.5 Fire Rated Doors: Where designated, doors, frames, hardware, and accessories shall bear the identifying label of the Underwriters' Laboratories, Inc., or a nationally recognized testing agency qualified to perform certificate programs indicating that units conform to the requirements of the Underwriters' Laboratories, Inc. Certificates of inspection shall be submitted in accordance with the requirements of NFPA 80 and 80A for fire doors exceeding the sizes for which label service is offered by Underwriters' Laboratories, Inc.
- 2.6 Manual Operation:
  - 2.6.1 Push-Up Operation: Doors shall have one lifting handle on each side of the door and shall be counterbalanced to provide ease of operation while raising or lowering the curtain by hand. The maximum exertion or pull required shall not exceed 25 pounds. Doors over 7 feet high shall be provided with pull down straps or pole hooks.
  - 2.6.2 Chain-Gear Operation: Chain shall be galvanized, endless type, operating over a sprocket and shall extend to within 3 feet of floor. Gears shall be high-grade gray iron, cast from machine-cut patterns. Gear reduction shall be calculated to reduce chain pull required to not exceed 35 pounds.
  - 2.6.3 Crank-Gear Operation: Crank shall be removable and located approximately 34 inches above the floor. Gears shall be of high-grade gray iron, cast from machine-cut patterns. Gear reduction shall be calculated to reduce pressure exerted on the crank to not over 35 pounds.
- 2.7 Motorized Operation:
  - 2.7.1 Electric Operators: Operators shall be furnished complete with electric motor, reduction gears, magnetic brake, friction clutch, emergency release for manual operation, heavy-duty roller chain, controls, limit switches, and other accessories.
  - 2.7.2 Motor: Motor shall be totally enclosed, constant duty type, instantly reversible, capable of moving door at not less than 3/4 foot per second and designed for high frequency operation.
  - 2.7.3 Controls: Each door motor shall have an enclosed reversing across-the-line type magnetic starter having thermal overload protection, solenoid-operated brake, limit switches, and one or more remote-control switches as required. The starter shall conform to NEMA ICS 2. Remote-control switches shall be of the three-button type with the buttons marked "OPEN", "CLOSE", and "STOP." CLOSE buttons shall be momentary-contact type requiring constant pressure to maintain motion of the door.
  - 2.7.4 Safety Device: The bottom edge of electrically operated doors shall have a safety device that will immediately reverse the door movement upon contact with an obstruction. The safety device shall be installed across the entire width of the door and shall not substitute for a limit switch.
- 2.8 Hot-dipped galvanized sheet steel surfaces shall be finished according to the requirements of ASTM A 525, G-90. Hardware items shall be galvanized according to ASTM A 153. Items galvanized after assembly shall comply with ASTM A 123.
- 2.9 Shop prime coat of rust-inhibiting paint shall comply with Fed. Spec. TT-P-86.
- 2.10 Tracks for overhead doors shall be designed to accommodate 2-inch or 3-inch diameter galvanized steel rollers. Tracks shall be fabricated of 13-gauge galvanized steel. Track shall have springs at the end of track to cushion the door at the end of the opening motion.
- 2.11 Track supports shall be angle iron, galvanized, and installed with cross-bracing to form a rigid construction.
- 2.12 Counterbalance shall be torsion-spring type for standard counter-balancing with tempered spring wire and continuous steel shaft. Provide cast aluminum and smooth cable drums with galvanized steel lift cables. Entire counterbalance assembly shall be mounted on ball bearings.
- 3.0 EXECUTION: Panels and frames that are field repaired shall be cleaned sufficiently for good paint adherence then primed to prevent further deterioration. Galvanized coatings that are damaged shall be repaired by the application of a high zinc dust content paint formulated for regalvanizing welds in galvanized steels.

**Sound Retardant Doors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of material for sound retardant doors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to

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support the work.

2.0 PRODUCTS:

2.1 General:

2.1.1 Each door location shall be complete with frame and integral acoustical type hardware accessories, mounting, and installation components.

2.1.2 Door unit shall conform to ASTM E 90 to achieve the required Sound Transmission Classification (STC).

2.2 Steel Sound Retardant Doors: Door assembly shall conform to SDI-100 and ANSI A115.

2.3 Wood Sound Retardant Doors: Door assembly shall conform to NWWDA I.S.1, ASTM E 90, AWI.

3.0 EXECUTION: Door units shall be installed complete with all necessary anchors and inserts, hardware, and other accessories. Upon completion of installation, doors shall be free from warp, twist, or distortion.

**Aluminum Safety Glass Doors**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of aluminum safety glass doors. Products shall match existing materials and/or as shall be directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Aluminum safety glass doors shall be manufacturer's standard and shall comply with the requirements of ANSI Z97.1, Fed. Spec. DD-G-1403, and the Safety Glazing Certification Council (SGCC) standards for heat strengthened and fully tempered safety glass.

2.2 Safety glass doors shall have clear tempered safety glass and shall be manufacturer's stock design in standard sizes. Glazing for door tolerance shall be dimension plus 1/16 inch, minus 1/8 inch. All door glazing shall be set in aluminum frames of sufficient strength to withstand heavy duty use.

2.3 Finish for aluminum frames shall be anodized AA-C22A 41RIX or AA-M21C22A 42RIX, as required, minimum 0.7 mil thickness with clear methacrylate lacquer coating, minimum 0.5 mil thick.

2.4 Hardware shall be manufacturer's standard finish to match aluminum frame door stiles and rails. Push-pull set shall be manufacturer's stock design flat plate units, approximately 6 inches by 10 inches, engraved with "push" and "pull." Custom designed push-pull (handles) set and required fittings shall be provided where required.

2.4.1 Lockset with deadbolt in lower rail engaging cut-out in threshold shall be keyed from both sides. Where required, provide a lockset with deadbolt in lock side of glass door, keyed from both sides.

2.4.2 For pairs of doors, provide a deadbolt in lower rail of each door that will engage a cut-out in the threshold and key from both sides.

2.4.3 Where floor recessed checking floor hinges are required, provide top pivot hardware. Where overhead closers are required, provide bottom pivot hardware. Provide checking floor hinges with sealed floor box, finished cover plate, separate adjustment screws for checking speed, and hold open device.

2.5 Threshold shall be manufacturer's standard, finished to match door rails and sized to suit door opening.

2.6 Anchorages and fastenings shall be manufacturer's standard concealed. Finish heads of exposed fasteners shall match finish of adjacent metal surfaces. 2.7 Locate and Provide Holes and Cutouts to receive hardware before tempering safety glass. Do not permit any cutting, drilling, or other glass alterations after tempering operation.

3.0 EXECUTION: (Section not used.)

**Wood Safety Glass Doors**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of wood safety glass doors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

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2.0 PRODUCTS:

- 2.1 Safety glass shall be clear, heat-strengthened, and fully tempered plate or float glass in compliance with the requirements of ANSI Z97.1 and the Safety Glazing Certification Council. Provide tinted or reflective tempered safety glass as required.
- 2.2 Wood for door frame, stiles, and rails shall be Douglas fir, redwood, cedar or select hardwood. Exposed wood surfaces shall be sanded, cleaned, and factory-primed ready for final finish coat. PVC clad wood safety glass doors shall be provided as required.
- 2.3 Provide factory-primed and finish-painted wood surfaces when no other field painting is required.
- 2.4 Hardware shall be manufacturer's standard style and designed for the door swing, door size, glass thickness, door weight, and area for access and egress. Hardware fittings of door shall match the hardware finish of the adjacent area.
  - 2.4.1 Provide heavy-duty hardware in heavy pedestrian or high traffic areas.
  - 2.4.2 Door push-pull sets or handles and hardware accessories shall be manufacturer's standard design. Provide floor closer with selective hold-open feature. Locks and deadbolts shall be keyed from both sides of bottom door rail or strike side of door stile.
  - 2.4.3 Where aluminum hardware finish is required, aluminum finish shall be anodized.
  - 2.4.4 Panic exit devices or electric strikes shall be furnished where required.
- 3.0 EXECUTION: (Section not used.)

**Screen and Storm Doors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of screen and storm doors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 The manufacturer shall be a recognized producer of screen and storm doors. See Hollow Metal Doors and Frames, Aluminum Doors and Frames, and Wood Doors.
  - 2.2 All work performed shall meet the requirements of local codes and regulations.
- 3.0 EXECUTION: (Section not used.)

**Entrances**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of entrance assemblies. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Entrance shall be a complete unit produced by one manufacturer recognized as producer of glass entrance panels with glass doors, weatherstripping, and hardware on operating door panel.
    - 2.1.1 Finishes Class I finish AA-M10C2231 or AA-M10C2241 for clear (natural) anodized, Class II finish AA-M10C2244 for color anodized, coating finish shall be fluoropolymer coatings contain at least 70% by weight Kaynar 500 resin (polyvinylidene fluoride)
  - 2.2 Extrusions for door construction shall be AA 6063-T5 alloy with clear anodized 204-R1-A1 finish and 22,000 psi ultimate tensile strength. Main member extrusions shall be not less than 0.125 inch in wall thickness.
  - 2.3 Aluminum sheet material for door construction shall be plain flat sheet for exposed faces of flush and panel doors of not less than 0.062-inch thickness.
  - 2.4 Fasteners shall be aluminum, stainless steel, or other non-corrosive metal fasteners compatible with the framing material. Exposed fasteners shall be Phillips flat-head screws matching fastened material.
  - 2.5 Steel reinforcement and brackets shall be manufacturer's special formed units with 2.0 ounce hot-dip zinc coating complying with ASTM A 153, applied after fabrication. 2.6 Frames shall be extruded tube sections manufactured from AA 6063-T5 alloy with clear anodized 204-R1-A1 finish, not less

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- than 0.125 inch in thickness. Frames to receive fixed glass shall have removable glass stops and beads.
- 2.7 Door shall be fabricated from extruded aluminum seamless tubular shapes. Top and bottom rails shall be welded to stiles with corner reinforcement. Joints shall be milled to hairline watertight fit. Welding shall be done on concealed surfaces and shall not blemish exposed surfaces. Door shall have extruded aluminum snap-in type glass stop with integral vinyl glazing insert.
  - 2.8 Weatherstripping shall be manufacturer's standard compression type neoprene gasket. Weatherstripping shall be easily replaced without special tools. Weatherstripping at meeting rails of pairs of doors shall be adjustable. Weatherstripping shall be applied to stiles, heads, and bottoms of doors.
  - 3.0 EXECUTION: Entrance assemblies shall be installed or repaired by the manufacturer or an authorized representative.

**Revolving Doors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of revolving doors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Door units shall be fabricated from extruded aluminum tube sections of AA 6063-T5 alloy, clear 204-RI-A1 anodized finish. Door framing members shall be 0.375-inch minimum wall thickness. Enclosure framing members shall be 0.125-inch minimum wall thickness. Snap-in type glass stops shall be minimum 0.050-inch thickness.
  - 2.1 Fabricate assembly with welded and mechanical construction; concealed, reinforced joints; and corners with flush hairline joints.
  - 2.2 Provide weatherstripping at stiles, head, and bottom of door wings.
  - 2.3 Door wings shall be arranged to collapse and fold to the emergency exit position when a pressure of not less than 100 pounds nor more than 140 pounds is applied to the outer door stile at the push bar height of 3 feet, 10 inches. No visible external braces or collapsing plates will be permitted.
  - 2.4 Door unit shall be provided with a mechanical floor-mounted speed control sealed unit to control the revolving door up to a maximum of 12 revolutions per minute.
  - 2.5 All work performed shall meet the requirements of local codes and regulations.
- 3.0 EXECUTION: Doors shall be installed or repaired by the manufacturer or an authorized representative.

**Metal Windows**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of steel, stainless steel, and bronze windows. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Fixed Windows, Hopper Vent: Window units shall comply with SWI-01, The Specifier's Guide to Steel Windows, for standard intermediate windows with bottom hinged, swing-in type ventilator hopper sash. Bottom rails of ventilators shall have an outside drip. Hardware shall be manufacturer's standard type for each window. Ventilator shall have one pair of hinges or pivots, two stay arms, and a cam-type lever handle latch. Sash and hardware shall be designed to permit easy removal of sash from inside the building.
  - 2.2 Fixed Windows: Fixed windows shall comply with the requirements of SWI-01, for standard intermediate windows.
  - 2.3 Projected Windows: Projected windows shall comply with the requirements of SWI-01, for commercial projected windows, with project-out type ventilators, top-hinged.
  - 2.4 Continuous Top-Hinged Windows: Continuous windows shall comply with SWI-01 continuous type

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- with manual operation.
- 2.5 Casement Windows: Casement windows shall comply with SWI-01, for standard intermediate windows. Hardware for operative sash shall provide for cleaning of both sides of the sash from the inside. Operating devices shall include underscreen type rotary operators of the worm-gear type with adjustable operating arms. A continuous drip molding shall be provided above operable sash. Abutting units or combination units shall have manufacturer's stock standard mullion.
  - 2.6 Awning Windows: Awning windows shall comply with the SWI-01, for architectural awning intermediate type frame and ventilator members. Ventilators in same frame shall operate in unison. Hardware for operative sash shall provide for cleaning of both sides of the sash from the inside. Operating devices shall include underscreen type rotary operators of the worm-gear type, with adjustable operating arms. The operator shall securely close the ventilators without using additional locking devices. Ventilators shall be designed to close and be weathertight to adjoining ventilators or frame. Window frame shall be designed with rebate to receive screens.
  - 2.7 Reversible Windows: Reversible horizontal pivoted windows shall comply with SWI-01, for commercial type.
  - 2.8 Hinged Emergency Windows: Hinged emergency type windows shall comply with SWI Recommended Specifications for Steel Windows, for commercial type, with manual operation side- or hinged for swing-out emergency exit, pivots or hinges for 90 degrees swing-out. Window shall be equipped with push-release type lever operator on window latch, complying with the requirements of local regulations for "panic hardware".
  - 2.9 Double/Single Hung Windows: Double and single hung windows shall comply with SWI Recommended Specifications for steel windows for commercial type. Two spiral type removable sash balances shall be provided for each sash. Balances shall be adjustable without removing sash from frame and without use of special tools. Each window 40 inches wide or less shall be provided with one sweep sash lock. Each window over 40 inches wide shall be provided with two sweep sash locks. Lower sash shall have one continuous integral lift at the bottom of the sash. The upper sash shall have a continuous integral pull down member on the meeting rail.
  - 2.10 Operating Hardware: Hardware shall be provided for all operable, ventilating sash units of manufacturer's standard for the function of each individual window type specified. All operable sash shall have a latch or locking device. Hardware shall be securely attached to the window with noncorrosive bolts or machine screws.
  - 2.11 Miscellaneous hardware shall comply with ANSI A156.16. All metal hardware for stainless steel windows shall be non-corrodible. All hardware items for bronze windows shall match window finish.
  - 2.12 Screens: Insect screens shall be full size of the operable unit. Screens shall comply with SWI-01 and shall have removable splines of steel or vinyl. Screening shall be 18 x 14 mesh, complying with Fed. Spec. RR-W-365 for wire fabric or Fed. Spec. L-S-125, Type II.
  - 2.13 Weatherstripping shall be the standard type for use with the window unit supplied and shall be easily replaceable.
  - 2.14 Materials for steel windows shall comply with the requirements of the following:
    - a. Sheet steel: Fed. Spec. QQ-S-700.
    - b. Zinc-coated steel: ASTM A 90 or A 123.
    - c. Zinc-coating on hardware: ASTM A 153.
    - d. Corrosion-resistant steel: Fed. Spec. QQ-S-766.
  - 2.15 Materials for stainless steel windows shall comply with the requirements of ASTM A 167.
  - 2.16 Materials for bronze frames shall comply with the requirements of ASTM B 96, ASTM B 100, ASTM B 150 or ASTM B 169.
  - 3.0 EXECUTION: Window units shall be installed complete with all necessary anchors, hardware, and other accessories and shall be plumb, square, and level in alignment, and braced and stayed properly to prevent distortion and misalignment.

**Aluminum Windows**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of aluminum windows. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product

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manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

- 2.1 Windows shall be furnished as a complete assembly including frame, sash, hardware, mullions, and anchorage devices. Windows indicated to have screen or storm units shall be designed to accommodate the items to be furnished. Aluminum extrusions shall be not less than 22,000 psi ultimate tensile strength and not less than 0.062 inch thickness at any location for main frame and sash members. Window sash and frames shall be designed for outside glazing of vision glass. Weatherstripping shall be easily replaceable. All operable sashes shall have a latch or locking device. Hardware shall be securely attached to the window with noncorrosive bolts or machine screws. Hardware finishes shall match window finishes. Where operating hardware is located 6 feet-6 inches or more above the floor, poles and pole-operated handles shall be provided to operate the windows.
- 2.2 Aluminum prime windows shall be fabricated and assembled in compliance with AAMA 101.
- 2.3 Double glazed windows shall have a minimum condensation factor in accordance with AAMA 1503.1-98.
- 2.4 Awning windows shall conform to AAMA 101, Commercial Grade. Hardware for top ventilators shall be designed to drop sash down in such a manner to permit cleaning of the outside glass from inside the building. All operating hardware except ventilator arms and rotary operators shall be concealed within frame and sill. Ventilator arms shall be concealed when unit is closed.
- 2.5 Basement windows shall conform to AAMA 101, Commercial Grade, single project-in at top vent.
- 2.6 Casement windows shall conform to AAMA 101, Commercial Grade. Each side hinge ventilator shall have non-friction type extension hinges, underscreen type rotary operator, and locking handles. Rotary operators shall be heavy-duty worm-gear type with machine cut case hardened steel gears.
- 2.7 Double-hung and single-hung Windows shall conform to AAMA 101, Commercial Grade.
- 2.8 Fixed windows and semi-circular head windows shall conform to specification P-A2, without ventilator sections.
- 2.9 Horizontal-sliding windows shall conform to AAMA 101, Commercial Grade.
- 2.10 Projected windows shall conform to AAMA 101, Commercial Grade. Where screens are specified, underscreen operators shall be provided for ventilators that open out.
- 2.11 Top-hinged windows shall conform to AAMA 101, Commercial Grade.
- 2.12 Vertically-pivoted windows shall conform to AAMA 101 Commercial Grade.
- 2.13 Storm windows shall be triple-track, self-storing, combination storm-and-screen type, conforming to AAMA 1002.10. Storm units shall be designed for the type of windows with which they will be used and shall provide a rigid unit in place, to permit all sashes to be removed from the inside and to lock into the open and closed positions. An interlocking scribe piece of the same material as the frame shall be provided at bottom edge. Units shall be complete with all mounting and operating accessories required to provide a weathertight installation.
- 2.14 Insect screens shall be provided for sash or ventilators of designated windows. Screens shall conform to AAMA 101. Insect screens shall be designed for the type of window with which they will be used and shall be interchangeable with other units of the same size and type. Screens for hopper ventilators shall be stationary type attached directly to the outside of the window unit.
- 2.15 Forced-entry resistant windows shall be in accordance with the recommendations specified in AAMA 1032.5.
- 2.16 High performance windows shall be in accordance with the requirements of AAMA 101.
- 2.17 Window cleaning anchors shall be of stainless steel and shall conform to ASME A39.1. Windows shall be reinforced for the reception of window cleaning anchors, if necessary to provide the required strength. Window frames shall be reinforced as may be required to receive the window cleaning anchors, and the window frames shall be anchored securely to the wall construction at point of application of the window cleaning bolts.
- 2.18 Finish: All exposed members shall be free of scratches and other serious surface blemishes. Prime windows shall have anodized finish or paint finish. Anodized finish shall be AA-M12C22A31 clear in accordance with AA Designation System for Aluminum Finishes. Paint finish shall conform to AAMA 603.8. Storm windows shall be mill finish or paint finish, white. Window unit finishes, cleaning, and

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chemical treatments shall comply with the requirements of NAAMM Metal Finishes Manual and AAMA 603.8.

- 3.0 EXECUTION: Final adjustment for proper operation of ventilating unit shall be made after glazing. Where aluminum surfaces are in contact with or fastened to dissimilar materials, except stainless steel or zinc, the aluminum surface shall be protected from dissimilar materials as specified in the Appendix of AAMA 101. Surfaces in contact with sealants after installation shall not be coated with any type of protective material.

**Wood Windows**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of wood windows, general. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Awning replacement window units shall comply with NWWDA I.S.2.
- 2.2 Single hung replacement window units shall contain one fixed sash and one balanced vertically-sliding sash and shall comply with NWWDA I.S.2.
- 2.3 Double hung replacement window units shall contain two balanced vertically-sliding sashes and shall comply with NWWDA I.S.2.
- 2.4 Horizontal-sliding replacement window units shall comply with NWWDA I.S.2.
- 2.5 Fixed replacement window units shall consist of sashes complying with NWWDA I.S.2 and frames complying with NWWDA I.S.1, or NWWDA I.S.2.
- 2.6 Window, screen, and storm sash units shall be manufactured from kiln-dried ponderosa pine, Idaho white pine, Northern white pine, or sugar pine.
- 2.7 Preservative Treatment: All wood parts shall be water repellent preservative-treated in compliance with NWWDA I.S.4. 2.8 Weatherstripping shall be manufacturer's standard nonferrous spring metal or vinyl gasket.
- 2.9 Insect Screens: Frames shall be manufacturer's standard formed aluminum or extruded aluminum frames. Insect screening shall be either nonferrous metal or plastic-coated fibrous glass insect screen cloth complying with Fed. Spec. L-S-125, Type II.
- 2.10 Window operations shall meet or exceed the minimum operating requirements as specified in NWWDA I.S.2. Each window unit shall be supplied with all operating devices required for easy operation and with suitable locks or latches.
- 2.11 Window Classification (Grade): Window units shall comply with Class A requirements as specified in NWWDA I.S.2.
- 2.12 Fabrication:
- 2.12.1 Sizes and profiles shall match existing work and shall be coordinated with actual measurements of window openings.
- 2.12.2 The scope of each replacement window unit, except as otherwise indicated, shall include the sash or sashes, frame, sill (including undersill or nosing, if any), exterior and interior trim, integral mullion and muntins (if any), hardware, and accessories.
- 2.12.3 Removable insect screens shall be provided for each operating sash.
- 2.12.4 Glazing stops (beads) shall be provided, nailed or snap-on, and coordinated with glass selection and glazing system as indicated.
- 2.13 Finishes:
- 2.13.1 Painting: Shop prime coat shall comply with Fed. Spec. TT-P-25, color white.
- 2.13.2 Vinyl cladding shall be manufacturer's standard bonded vinyl cladding with permanent paintable finish.
- 2.13.3 Aluminum cladding shall be manufacturer's standard formed sheet or aluminum cladding with baked-on acrylic coating.
- 2.14 Woven glass cloth shall weigh not less than 2.0 oz./sq. yd. and shall withstand 120 lbs. of pull per square inch. Resin and hardener catalyst shall be as recommended by the manufacturer of the resin.

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3.0 EXECUTION: (Section not used.)

**Finish Hardware**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of finish hardware. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Labeled fire doors shall have fire rated hardware, including smoke seals where required by code, in accordance with NFPA 80. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Hardware finishes shall conform to those identified under ANSI/BHMA A156.18. Finish of fasteners shall match finish of hardware items on which they are applied.
- 2.1 Locks and Latches: To the maximum extent possible, locksets, latchsets, and deadlocks shall be the products of a single manufacturer. Mortise type locks and latches for doors 1-3/4 inches thick and over shall have adjustable bevel fronts or otherwise conform to the shape of the door. Lock fronts for double-acting doors shall be rounded. Mortise locks shall have armored fronts. Strikes for wood frames and pairs of wood doors shall be furnished with wrought boxes. Trim for mortise locks and latches shall be escutcheon, minimum 7 inches by 1-3/4 inches or sectional, as required, with wrought knob and cast shank and shall conform to the requirements for wrought trim in accordance with ANSI A156.2. Manufacturers' standard plain design shall be used. Keying system shall match remainder of building system (if applicable) or shall be as specified.
  - 2.1.1 Cylinder Locks: Cylinder shall have either six or seven pins with paracentric keyway, as required. Cylinders and the locks in which they are used shall be the product of the same manufacturer. Cylinders shall be provided with removable type single key cores, where required.
  - 2.1.2 Deadlocks: ANSI A156.5, mortise type, cylinder-operated, E16000 series.
  - 2.1.3 Interconnected Locks and Latches: ANSI A156.12, Grade 1 or 2.
  - 2.1.4 Locksets and latchsets shall conform to the following types, as required: ANSI A156.2, series 1000, Grade 2; 2000, Grade 1; 4000, Grade 1; A156.13, Operational Grade 1 or 2; and Security Grade 1, 2, 3, or 4. 2.1.5 Locksets for Lead-Shielded Doors shall be provided with factory-installed lead linings. Lead linings shall not be less than the thickness of the lead in the door in which the lockset is required.
  - 2.1.6 Cipher Locks: Cipher locks shall be mechanically operated push button units, with or without master key bypass capability, and changeable by authorized access key.
  - 2.1.7 Padlocks: ASTM F 883.
- 2.2 Door Trim: ANSI A156.6.
  - 2.2.1 Armor plates shall be category J100, plastic, aluminum, brass, or stainless steel, as required, 40 inches in height, 2 inches less in width than the width of the door for single doors, and 1 inch less for pairs of doors. Edges of metal plates shall be beveled where required. Where the door has a louver panel, the armor plate shall be omitted if top of louver frame is more than 20 inches above the bottom of the door.
  - 2.2.2 Arm pulls shall be Category J400, double base, aluminum, brass, or stainless steel.
  - 2.2.3 Combination push-pull plates shall be Category J300, 1/8 inch minimum, aluminum, brass, or stainless steel beveled four edges.
  - 2.2.4 Drop ring pulls shall be Category J400, aluminum, brass, or stainless steel.
  - 2.2.5 Kick plates shall be Category J100, plastic, aluminum, brass, or stainless steel. Width of plates shall be 2 inches less than door width for single doors and 1 inch less for pairs of doors. Height shall be 10 inches, except where the bottom rail is less than 10 inches, the plate shall extend to within 1/2 inch of the panel mold or glass bead. Edges of metal plates shall be beveled, where required.
  - 2.2.6 Armor plates and mop plates shall be Category J100, plastic, aluminum, brass, or stainless steel. Width of plates shall be 2 inches less than door width for single doors and 1 inch less for pairs of doors. The height of mop plates shall be 4 inches. Edges of metal plates shall be beveled, where required.
  - 2.2.7 Push and pull bars shall be Category J500, aluminum, brass or stainless steel, where required. Edges of mounting plates shall be beveled.
  - 2.2.8 Push plates shall be Category J300, aluminum, brass, stainless steel, or plastic, in color as required,

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- size as required. Edges of metal plates shall be beveled, where required.
- 2.2.9 Sectional door pulls for metal or Kalamein doors shall be Category J400 brass, thru-bolted type of plain modern design. Door pulls on plates for wood doors shall be Category J400 aluminum, brass, or stainless steel with beveled edges, as required.
  - 2.3 Exit Devices and Exit Device Accessories: ANSI A156.3.
    - 2.3.1 Door coordinator shall be Type 21 and shall be provided for each pair of doors with closers and equipped with an overlapping astragal.
    - 2.3.2 Removable mullions shall be Type 22 of the box type and shall be used only with those exit devices for which the mullions were manufactured. Mullions shall be furnished with mullion stabilizers of the same manufacturer.
  - 2.4 Door Controls: Overhead holders conforming to ANSI A156.8.
  - 2.5 Auxiliary hardware, including door surface bolts, door holders, door stops, and roller latches, of the types required, shall conform to ANSI A156.16.
    - 2.5.1 Lever Extension Flush Bolts: Type L14081, installed at the top and bottom of the inactive leaf of pairs of doors, and mortised in the lock edge of the door.
    - 2.5.2 Dust-Proof Strikes: Type L04011.
    - 2.5.3 Garment Hooks: Type L03111.
    - 2.5.4 Hand Rail Brackets: Type L03061, L03081, L03091, or L03101.
    - 2.5.5 Garment Rods: Type L03131 or L03141.
    - 2.5.6 Coat Hook: Type L03111.
    - 2.5.7 Door Stop, Adjustable Hinge Type: Type L02223.
    - 2.5.8 Door Stop, Wall Type Flexible, 3 inch: Type L02051, L02052, L02053.
    - 2.5.9 Door Stop, Wall Type Flexible, 4 inch: Type L02061, L02062, L02063.
    - 2.5.10 Door Stop, Floor Mounted, Type L02143.
  - 2.6 Hinges: ANSI A156.1. Hinges used on metal doors and frames shall also conform to ANSI A156.7.
    - 2.6.1 Hinges for reverse bevel doors with locks shall have pins that are made nonremovable by means such as a set screw in the barrel, or safety stud, when the door is in the closed position.
    - 2.6.2 Hinges with anti-friction bearings may be furnished in lieu of ball bearing hinges, where required. Fire door hinges shall be in accordance with NFPA 80.
  - 2.7 Door Closing Devices: ANSI A156.4.
    - 2.7.1 Surface type closers shall be Series C01000, C02000 Standard Cover, C02000 Full Cover with option PT-4C, or C03000 with options PT-4A and PT-4D, where required. Mounting details for the type closers to be used shall be in accordance with manufacturer's standards. Closers for screen and storm doors shall be Type C09353. Closers for outswinging exterior doors shall have parallel arms or shall be top jamb-mounted. Closers for interior doors close to a wall shall be of narrow projection so as not to strike the wall at the 90 degree open position or shall have parallel arms.
    - 2.7.2 Floor closers and pivots shall have cement boxes. Floor closers and pivots used on the same door shall be the product of one manufacturer only. Floor plates are not required where thresholds cover the closer cement box. Setting tools shall be furnished for use in installing floor closers.
  - 2.8 Smoke Detectors and Magnetic Holders: ANSI A156.15. Door closers with integral holders connected to a separate detection device or closers with integral holders and detector units, sensing particles of combustion that when activated will release the holder mechanism causing the closer to close the door may be used in lieu of separate closers, detectors, and magnetic holders. Closers shall be listed or labeled by a nationally recognized independent testing laboratory.
  - 2.9 Key Control Storage System: ANSI A156.5, type and capacity as required, properly labeled for key identification.
  - 2.10 Metal Thresholds: Thresholds for exterior metal doors with weatherstripping shall be extruded aluminum or bronze, flat type with fluted top and shall provide proper clearance and an effective seal with specified weatherstripping. Thresholds for use with floor closers shall conform to ANSI A156.4. Latching thresholds shall conform to ANSI A156.3, Type 26, and of such height that the bottom of the door shall be 1/8 inch over the tread of the threshold and 1/8 inch below the top of the stop.
  - 2.11 Door Silencers: Molded rubber, ANSI A156.16, Type L03011 for metal doors and Type L03021 for wood doors.

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- 2.12 Exit Control or Exit Locks: ANSI A156.5, activated by arm and push plate or paddle. Outside key control shall be provided where required. Units shall be battery-powered. Alarm horns or mechanical bell, when set by inside key, shall sound when door is opened. Units shall have dead bolts or protected latches with either surface or mortised strike. Where required, furnish with silent alarm for indication at a remote panel or a low voltage system. Exit control locks or exit locks shall be as follows.
  - 2.12.1 Single Door: Type E 0421.
  - 2.12.2 Double Door: Type E 0421 (One leaf to have top and bottom bolt activated by cross bar. Other leaf to have Type E 0431 exit lock.)
- 2.13 Electric Strikes: ANSI A156.6. Rim-mounted strikes shall be Type E09312 for use with rim latches or rim or surface vertical rod exit devices. Mortised strikes shall be Type E 09322 for use with locks not having dead bolts and with mortise exit devices, all with or without auxiliary dead latch.
- 2.14 Bored Auxiliary Deadlocks: ANSI A156.5. Dead locking latch bolts operated by key from either side shall be Type E2141.
- 2.15 Mortised Deadlocks: ANSI A156.5. Dead bolts operated by key from either side shall be Type E16061.
- 2.16 Weatherstripping: Provide only those units where resilient or flexible seal strip is easily replaceable and readily available from stocks maintained by manufacturer. Provide fasteners that are exposed when door is either open or closed to match finish of stripping and seals.
  - 2.16.1 Weatherstripping at Jambs and Heads of Doors:
    - 2.16.1.1 Bumper-type Resilient Inserts and Metal Retainer Strips: Surfaced-applied unless required to be mortised or semi-mortised; anodized retainer strips; resilient bumper material to be neoprene or vinyl. Adjustable insert of extruded metal and captive adjustment screws designed to act as combination door stop and seal.
    - 2.16.1.2 Spring-Metal Type Stripping: Bronze, 0.009 inch minimum thickness for sliding compression, 0.006 inch minimum thickness for direct compression; aluminum, 0.008 inch minimum thickness; stainless steel, 0.005 inch minimum thickness.
    - 2.16.1.3 Self Adhesive Strips: Ribbed sponge neoprene. Adhesive shall be reinforced with glass fibers. Strip size shall be 3/16 inch by 3/8 inch minimum.
  - 2.16.2 Astragal Stripping On One Active Leaf:
    - 2.16.2.1 Metal Astragal Bar: Not less than 1/8 inch x 1-3/4 inches, for exposed flat-head screw mounting one leaf of extruded aluminum, anodized finish.
    - 2.16.2.2 Closed-Cell Neoprene Astragal Bar: Approximately 3/8 inch x 1-1/4 inches with metal retainer strip for mounting on one leaf of extruded aluminum, 0.094 inch, anodized finish.
  - 2.16.3 Meeting Seals, Both Leaves Active:
    - 2.16.3.1 Metal Housing Strips (Door Centers): With adjustable insert plunger strips retained in housing with captive screws; mortised, semi-mortised, or surface-mounted, as required; double units applied to both leaves and single units applied to only one leaf; extruded aluminum, 0.062 inch thick, anodized finish. Seal materials shall be metal faces on both adjustable inserts or metal face on one adjustable insert, pile insert on the other. Provide pile insert of wool, polypropylene, or nylon pile with aluminum strip backing complying with AAMA 701.2.
    - 2.16.3.2 Metal Strips: To retain hollow extrusions or sheets forming flexible plastic seals; extruded aluminum, 0.062 inch thick, anodized finish. Seal materials shall be one of the following:
      - a. Heavy neoprene sheet, light grey.
      - b. Light neoprene sheet, light grey, filled with soft cellular plastic or neoprene backing.
      - c. Heavy neoprene sheet, black, complying with Mil. Spec. MIL-R-6855, Class II, Grade 40.
      - d. Heavy flexible vinyl plastic sheet, light grey.
      - e. Heavy, fabric-reinforced rubber, black.
    - 2.16.3.3 Surface-Mounted Metal Strips: To retain flexible seal strips acting as sweeps or wipers; extruded aluminum, 0.062 inch thick, anodized finish; seal material to be extruded neoprene wiper or sweep, flexible vinyl wiper or sweep, flexible vinyl bulb, or wool or polypropylene pile wiper or sweep.
    - 2.16.3.4 Pile-Type Stripping: Wool, polypropylene, or nylon woven pile with aluminum stripbacking, complying with AAMA 701.2, mounted in manufacturer's standard aluminum housing (non-

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- adjustable type) in edge rail. Mount units in meeting edges of both leaves of pairs of doors or in meeting edge of only one leaf of pairs of doors.
- 2.16.3.5 Spring-Metal Type Stripping: Mounted in meeting edges of only one leaf of pairs of doors; formed of spring bronze, 0.009 inch thick or spring stainless steel, 0.008 inch thick, as required.
- 2.16.4 Automatic Door Bottoms:
- 2.16.4.1 Door sill protection shall be weatherproof automatic door bottoms. Plunger shall automatically seal with delayed action when door closes and shall retract when door opens. Automatic door bottoms shall be surface-mounted, fully mortised, or semi-mortised types.
- 2.16.4.2 Metal: Extruded aluminum, 0.070 inch thick, anodized finish.
- 2.16.4.3 Seal: Sponge neoprene, Mil. Spec. MIL-R-6130, Type II, Grade A, B, or C, as required.
- 2.16.5 Door Bottom Sweeps: Retainer of extruded aluminum, 0.070 inch thick, anodized finish; seal of solid neoprene, Mil. Spec. MIL-R-6855, Class II, Grade 40, soft, oil-resistant, which shall remain flexible down to -60 F.
- 2.17 Automatic Entrance Door Operators: ANSI A156.10 and UL 325. Size shall be as recommended by manufacturer's published data for door size, weight, movement, and condition of exposure for operation under normal traffic load for the type of occupancy as required. Exposed housing for operators shall be extruded or formed aluminum, 0.062 inch minimum thickness, with provisions for maintenance access, and with fasteners concealed in door when door is in closed position. Operators shall be fully adjustable for opening, closing, and checking speeds, as well as length of time door remains open without removal of doors. Operators in hazardous areas shall have explosion-proof motors, operators, and control devices. Door operators shall be provided that will open and close doors and maintain them in fully closed position when subjected to a wind velocity or equivalent inward pressure differential of 20 mph.
- 2.17.1 Swing Door Operators: Hydraulic, pressurized unit, with separate cylinders for power and checking. Provide spring action for closing under normal operation and provide emergency release for manual swing-out action on swing-in doors, which are indicated to function as exits. Operator actions such as swing-in, swing-out, double swing, or pairs shall be as required. Provide overhead concealed, surface-mounted, or floor-recessed operators, self-contained with connections for power and control wiring, where required.
- 2.17.2 Sliding Door Operators:
- 2.17.2.1 Hydraulic door operators for sliding doors shall be a pressurized unit with hydraulic cylinder power opening and either power or spring closing with safety release clutch for obstructed closing and with hydraulic checking for both opening and closing cycles. Provide for manual sliding when power is off. Operator actions such as single slide, bi-parting, and emergency break-away swing feature shall be as required. Provide overhead concealed operators where required. Provide self-contained units, where required, with connections for power and control wiring. Provide remote unit, where required, with interconnecting tubes and connections at power unit for power and control wiring.
- 2.17.2.2 Pneumatic door operators for sliding doors shall be air-opened and either air- or spring-closed with safety release clutch for obstructed closing and with pneumatic checking in both cycles. Provision shall be made for manual sliding when power or air pressure is off. Operator actions such as single slide, bi-parting and emergency breakaway features shall be as required. Provide overhead concealed operators where required. Power unit shall be remote compressor unit.
- 2.17.3 Door Operator Controls and Accessories:
- 2.17.3.1 Floor Mat Control Panels: Provide units complete with extruded aluminum mat, frames, recessed to fit flush with floor; concealed anchorage, manufacturer's standard synthetic rubber; or flexible plastic, safety ribbed surface pattern, standard color; containing pressure switches for low-voltage control wiring and intended for either sliding or single acting swing door control, with "Opening" section and "Safety" section switches. Mats shall be 1/2 inch thick. Where required to be installed over existing floor finish, provide surface-mounted frame with tapered safety edge.
- 2.17.3.2 Photo-Cell Control System: Horizontal beam system.
- 2.17.3.3 Electrical Interlocks: Interlocks that prevent operation of unit when door is locked latched, door bolted are required unless units are equipped with self-protected devices or circuits.
- 2.17.3.4 Sliding Door Opening Width Control Switch: Two-position switch that, in normal position, allows

Attachment 1: Specifications for the Work

sliding doors to travel to full opening width and, in alternate position, reduces opening to a selected partial opening width.

- 2.18 Finishes: Exposed surfaces of hardware shall have one of the following finishes:
  - 2.18.1 Bright Brass, Clear Coated: ANSI/BHMA A156.18.
  - 2.18.2 Satin Brass, Clear Coated: ANSI/BHMA A156.18.
  - 2.18.3 Satin Bronze, Clear Coated: ANSI/BHMA A156.18.
  - 2.18.4 Bright Chromium Plated: ANSI/BHMA A156.18.
  - 2.18.5 Satin Chromium Plated: ANSI/BHMA A156.18.
  - 2.18.6 Bright Stainless Steel: ANSI/BHMA A156.18.
  - 2.18.7 Satin Stainless Steel: ANSI/BHMA A156.18.
  - 2.18.8 Primed Paint Finish.
- 3.0 EXECUTION:
  - 3.1 Application: Hardware shall be located on doors in accordance with DHI publication, Recommended Locations for Builders' Hardware for Standard Steel Doors and Frames. When approved, slight variations in locations or dimensions will be permitted. Application shall be in accordance with DHI publication, The Installation of Commercial Steel Doors and Steel Framing, Insulated Steel Doors in Wood Frames, and Builders' Hardware. Door control devices for exterior doors such as closers and holders, shall normally attach to doors with thru-bolts such as sex bolts and nuts.
    - 3.1.1 Hardware for labeled fire doors shall be installed in accordance with the requirements of NFPA 80 and
    - 3.1.2 Door-closing devices shall be installed and adjusted in accordance with the templates and printed instructions supplied by the manufacturer of the devices. Insofar as practicable, doors opening to or from halls and corridors shall have the closer mounted on the room side of the door.
    - 3.1.3 Floor Closers: Setting tools shall be used in the installation of floor closers.
    - 3.1.4 Kick plates shall be installed on the push side of single acting doors and on both sides of double-acting doors.
    - 3.1.5 Door operators shall be installed in accordance with manufacturer's instructions, including piping, controls, control wiring, and remote power units. Air supply for pneumatic operators shall provide regulated air pressure for each door as required for equipment purchased. In areas subject to extreme cold, dehydrating equipment shall be furnished.

**Glass and Glazing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of glass and glazing materials. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Glazing Compounds and Preformed Glazing Sealants: A suitable type of glazing compound or preformed glazing sealant in compliance with section Glazing Materials of the FGMA Glazing Manual shall be provided.
    - 2.1.1 Gunnable Polymer Glazing Sealants shall be as follows:
      - 2.1.1.1 Acrylic (one-part): Fed. Spec. TT-S-00230.
      - 2.1.1.2 Butyl (one-part): Fed. Spec. TT-S-001657.
      - 2.1.1.3 Polysulfide (one- or two-part): Fed. Spec. TT-S-00230 and TT-S-00227.
      - 2.1.1.4 Polyurethane (one- or two-part): Fed. Spec. TT-S-00230 and TT-S-00227.
      - 2.1.1.5 Silicone (one-part): Fed. Spec. TT-S-001543 and TT-S-00230.
    - 2.1.2 Glazing Preformed Tapes shall be butyl or polyisobutylene/butyl and shall be manufacturer's standards.
    - 2.1.3 Knife Grade Glazing Sealants shall be as follows:
      - 2.1.3.1 Wood Sash Putty: Fed. Spec. TT-P-00791.
      - 2.1.3.2 Face Glazing Compound: ASTM C 669.
      - 2.1.3.3 Steel Sash Putty: Manufacturer's standard.
      - 2.1.3.4 Channel Glazing Compound: Manufacturer's standard.

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- 2.1.4 Gaskets for Glazing shall be as follows:
  - 2.1.4.1 Dense Neoprene: ASTM C 542 (lock-strip gaskets).
  - 2.1.4.2 Foam Neoprene: ASTM C 509.
  - 2.1.4.3 PVC: ASTM D 2287.
  - 2.1.4.4 Mullion Sections shall be manufacturer's standard for glass size provided.
- 2.2 Glazing Accessories: Glazing points, chips, shims, angles, beads, setting blocks, spacer strips, and other glazing accessories shall be provided where required to provide a complete installation.
- 2.3 Float, Plate or Glass:
  - 2.3.1 Clear Glass: ASTM C 1036, Type I, Class 1, Quality q3.
  - 2.3.2 Heat-Absorbing Glass: ASTM C 1036, Type I, Class 2, Quality q3, Style A.
  - 2.3.3 Light-Reducing Glass: ASTM C 1036, Type I, Class 3, Quality q3.
  - 2.3.4 Greenhouse Glass: ASTM C 1036, Type I, Class 1, Quality q6.
- 2.4 Tempered Glass: ASTM C 1048, Kind FT, Condition A; Type I, Quality q3 or Type II, Quality q8. All tempered glass shall be purchased to meet field dimensions and shall not be altered in the field.
- 2.5 Wired Glass: ASTM C 1036, Type II, Class 1, Form 1, Mesh M1, 1/4 inch thick and in compliance with ANSI Z97.1. Wired glass for fire doors and windows shall comply with NFPA 80.
- 2.6 Figured Glass: ASTM C 1036, Type II, Class 1, Form 3, Quality q8, 1/8 inch thick.
- 2.7 Rough Glass: Rolled, translucent, flat, glazing quality, one side rough and the other polished, 7/32 inch thick.
- 2.8 Laminated Glass: Laminated glass shall be fabricated from two pieces of clear, heat-absorbing, light-reducing, or wired glass, as designated and previously specified, laminated together with a clear vinyl inter-layer. Laminated glass shall comply with ANSI Z97.1.
- 2.9 Insulating Glass:
  - 2.9.1 Hermetically sealed glazing units shall be fabricated of two lites of glass, separated by a dehydrated air space that is 1/2 inch unless otherwise designated and sealed permanently at the edges. Clear, light-reducing, heat-absorbing, figured, wired, and tempered glass shall be as previously specified.
  - 2.9.2 Manufacturer's standard fused-glass edge construction shall use double-strength clear sheet glass and shall only be provided in small applications under 30 sq ft.
- 2.10 Mirror Glass: Plate or float glass complying with ASTM C 1036, Type I, Class 1, Quality q2, and 1/4 inch thick except as otherwise indicated with a silver coating and protective electrolytic copper coating not less than .0002 inch thick, complying with Fed. Spec. DD-M-411. The protection of the mirror back shall conform to Fed. Spec. DD-M-411.
- 2.11 Glazing Plastics:
  - 2.11.1 Cast acrylic glazing plastic sheets of 1/4 inch thickness, of clear transparent acrylic plastic with a light transmittance of 92 percent for a 1/4-inch sheet, impact resistance to withstand a 16-foot drop of a 1/2-pound steel ball on a 12-inch x 12-inch x 1/4-inch edge-supported sheet, modulus of elasticity of approximately 450,000 psi, flexural strength of 16,000 psi, and 180 F allowable continuous service temperature.
  - 2.11.2 Cast polycarbonate glazing plastic sheets of 1/4-inch thickness of clear transparent polycarbonate plastic, with a minimum light transmittance of 82 percent for a 1/4-inch sheet and free of significant dimensional change for exterior exposure. Drop ball impact resistance of 200 foot-pounds, for a 12-inch x 12-inch x 1/8-inch edge-supported sheet, modulus of elasticity of 340,000 psi, flexural strength of 13,500 psi, and 250 F allowable continuous service temperature.
  - 2.11.3 Reinforced polyester glazing plastic sheets of 1/8-inch thickness of clear translucent acrylic-modified polyester plastic sheet with invisible glass fiber reinforcement compounded specifically for exterior exposure with U.V. absorbers with a light transmittance of 92 percent for an 1/8-inch sheet, manufacturer's standard figured or textured surfaces, a modulus of elasticity of 721,000 psi, flexural strength of 17,800 psi, and 180 F allowable continuous service temperature.
  - 2.11.4 Reinforced polyvinyl chloride sheets of 0.12 inch thickness of clear transparent rigid polyvinyl chloride with .011-inch galvanized steel mesh woven to 10 mesh screening and located in the center of the sheet thickness. The sheet shall have a light transmission of 85 percent for a 1/4-inch sheet, tensile strength of 8,500 psi, flexural modulus of 550,000 psi, and flexural strength of 15,000 psi.

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- 2.12 Bullet-Resisting Glass: Glass shall be fabricated from Type I, Class 1, Quality q3 glass with polyvinyl butyral plastic interlayers between the layers of glass. The thickness of each layers of glass shall be in accordance with the manufacturer's standard practice. The total nominal thickness of the laminated glass shall be 1-3/16 inches. Glass shall meet the test requirements of the Underwriters' Laboratory for bullet-resisting materials. Listing in Underwriters' Laboratory Guide COGT will be accepted as evidence of compliance with this requirement in lieu of a certificate.
- 2.13 One-Way Vision Glass: Glass shall be fabricated from Type I, Class 1, Quality q2, 1/4-inch thick glass. One face shall be coated with a hard adherent film of chromium or other approved coating of proven equivalent durability. The glass shall transmit not less than 5 percent or more than 11 percent of total incident light in the visible region and shall reflect from the front surface of the coating not less than 45 percent of the total incident light in the visible region.
- 2.14 Spandrel Glass: ASTM C 1048, Kind HS, Condition B, Type I, Quality q5. 2.15 Reflective Glass: ASTM C 1048, Kind HS or FT, Condition C, Type I, Quality q3, with minimum 10 percent visible light transmission and maximum 25 percent solar energy transmittance.
- 3.0 EXECUTION:
  - 3.1 Preparation: Preparation of glazing and surrounding area shall comply with the details and general conditions governing glazing in the FGMA Glazing Manual unless otherwise specified.
    - 3.1.1 Glazing: Remove broken glazing and putty from frames.
    - 3.1.2 Frames: Clean existing frames. Replace missing or inoperative gaskets and glazing beads.
  - 3.2 Installation:
    - 3.2.1 General: The Contractor shall determine glazing dimensions by measuring the actual opening to receive the glass. Install sheet glass with the visible lines or waves running with the horizontal dimensions. Leave labels in place until the installation is approved.
    - 3.2.2 Glass Setting: Items shall be glazed using glass of the quality and thickness specified or indicated. Doors and windows may be glazed in compliance with one of the glazing methods described in the standards under which they are produced, except the face puttying method will not be permitted.
    - 3.2.3 Wired Glass: Install wire glass for fire doors and fire windows in compliance with the requirements of NFPA 80.
    - 3.2.4 Cleaning: Glass surfaces shall be thoroughly cleaned, with labels, paint spots, putty, and other defacements removed and shall be clean at the time the work is accepted.

**Aluminum Window Walls/Curtain Walls**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of aluminum window walls. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 System Performance:
    - 2.1.1 Load-bearing strength (wind resistance) shall be in accordance with ASTM E 330, ANSI A58.1, and AAMA CW 1-9.
    - 2.1.2 Deflections and thermal movements shall be as recommended by the wall manufacturer for the project site.
    - 2.1.3 Leakage Resistance: Air leakage shall be in accordance with ASTM E 283. Water penetration shall be in accordance with ASTM E 331.
    - 2.1.4 Condensation shall be in compliance with AAMA 1502.7 for the project site.
    - 2.1.5 Sound transmission classification (STC) shall be as designated by the Authorized Member Representative and in accordance with ASTM E 90.
    - 2.1.6 The wall system shall comply in general with applicable provisions of the AAMA Metal Curtain Wall, Window, Store Front, and Entrance Guide Specifications Manual (GSM-1).
  - 2.2 System Components:
    - 2.2.1 Aluminum members (extrusions, formed members, sheet, and plate) shall be in compliance with requirements of ASTM B 221 for extrusions and ASTM B 209 for sheet/plate.
    - 2.2.2 Insulated panels shall be laminated aluminum-faced panels finished to match window wall framing.

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- Face sheets shall be not less than 0.0249 inch thick. Concealed back sheets shall be of aluminum or galvanized steel. Edge condition of panels shall be prepared for installation into framing, and either sealed or vented to exterior only. Panels shall be flat, with no deviations exceeding 5 thousands of an inch in 12 inches. Insulated core shall meet the designated k-value.
- 2.2.3 Brackets and reinforcements shall be high-strength aluminum units where feasible. Otherwise, nonmagnetic stainless steel shall be used, except at fabricator's option. Brackets not exposed to weather or abrasion may be hot-dipped galvanized steel complying with ASTM A 386. Provide nonstaining, nonferrous shims for installation and alignment of window wall work.
  - 2.2.4 Window cleaner's bolts, if required, shall be nonmagnetic stainless steel complying with ASME A39.1.
  - 2.2.5 Concealed flashing shall be dead-soft stainless steel, 26 gauge.
  - 2.2.6 Fasteners and accessories shall have exposed portions matching finish of window wall system. At joints where movement must be accommodated, provide slip-joint linings of sheets, pads, shims, or washers of fluorocarbon resin or similar material recommended by manufacturer.
  - 2.2.7 Inserts for concrete masonry shall be cast iron, malleable iron, or hot-dipped galvanized steel complying with ASTM A 386.
  - 2.2.8 Firestopping materials shall be mineral fiber insulation or other noncombustible material suitable for permanent placement and complying with applicable regulations.
  - 2.2.9 Finishes shall comply with NAAMM AA-M32C21A31 (0.4 mil) for natural aluminum color and NAAMM AA-M32C21A32 (0.4 mil) for integral color anodized finish.
  - 3.0 EXECUTION: (Section not used.)

**DIVISION 9-FINISHES**

**Plaster Repairs**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of plaster for repairs. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 General: Materials shall comply with ASTM C 841 and C 842 unless otherwise specified.
  - 2.2 Finish Plaster shall be gypsum plaster or Keene's cement.
  - 2.3 Lath and Furring shall be wood, gypsum, or metal to match existing. Paper backing shall be used on metal lath except when applied over masonry or concrete. Lath for Portland cement plaster shall comply with ASTM C 1063.
  - 2.4 Portland cement: ASTM C 150, Type I or Type II. Only one type and brand shall be used in the work.
  - 2.5 Portland cement Plaster: CSI 09220.
  - 2.6 Metal Trim: New metal trim required for replacement of damaged or deteriorated trim shall be compatible with the existing metal trim.
  - 2.7 Gypsum Wallboard for repair of solid but severely cracked plaster shall be 1/4 inch thick, 4-foot by 8-foot sheets.
  - 2.8 Color: FED. STD. 595.
- 3.0 EXECUTION:
  - 3.1 Preparation: Appropriate measures shall be taken to contain dust and protect adjacent surfaces during removal and replacement. Damaged or deteriorated plaster and accessories shall be removed and disposed of as required. Surfaces to which old plaster was applied shall be cleaned of all loose or foreign materials, which might inhibit bonding or proper fitting of new plaster, lathing, and accessories. Concrete or masonry surfaces to be replastered shall be coated with a continuous film of bonding agent.
  - 3.2 Environmental Conditions: A temperature of not less than 55 F shall be maintained in the building for 24 hours before, during, and after plaster application.
  - 3.3 Plaster Installation: Plaster shall be installed in compliance with ASTM C 842. Portland cement

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plaster shall be installed for all exterior surfaces and all interior surfaces subject to high humidity. Gypsum plaster shall be installed for all remaining interior surfaces. Color, texture, finish, and thickness of plaster shall match adjacent, undamaged plaster or designated areas.

- 3.3.1 Plaster over Existing Work: Where replacement of the top or finish coat only is required, only the damaged or deteriorated finish coat shall be removed. New finish coat shall be applied, allowed to dry, and sanded to bring smooth with existing adjacent surfaces.
- 3.3.2 Ornamental Plaster: New plaster shall be run full, straight, and true with molding plaster using clean cut metal conforming to the existing profiles. Rough spots shall be sanded and left ready for painting.
- 3.3.3 Restoration: The Contractor shall replace or reinstall to the original condition all materials removed to get to the repair work. Materials damaged during removal or reinstallation shall be replaced with similar new materials.

**Gypsum Drywall and Metal Studs**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of gypsum drywall. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Application procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS
  - 2.1 Gypsum Panel - Sheetrock fire code gypsum panels (single layer).
  - 2.2 Fasteners - Self-tapping steel screws with rust inhibited coating.
  - 2.3 Insulation - 11/2- inch termafiber sound attenuating blankets or as circumstance dictates.
  - 2.4 Metal Accessories - Corner Beads, trim, etc. shall be galvanized steel.
  - 2.5 Joint Treatment - As recommended by manufacturer.
  - 2.6 Perimeter Caulking - Acoustical as recommended by manufacturer.
  - 2.7 Control Joints - Zinc.
  - 2.8 Joint compound shall be asbestos free type.
  - 2.9 Acoustical Sealant -As recommended by Manufacturer.
  - 2.10 Metal Studs
    - 2.10.1 Steel studs shall be hollow type spaced 16-inches on centers of sizes indicated, built up with diagonal wire web of No. 7 gauge cold drawn wire, diagonally spaced and welded at 8-inch intervals between outer chords on 1/2- inch x 1/2-inch angles, No. 16-gauge cold rolled steel.
    - 2.10.2 Place steel studs approx. 2-inches from abutting partitions and 2-inches from each side of interior angle of all corners.
    - 2.10.3 Steel studs shall be secured to top tracks with 22-ga. Galvanized steel adjustable stud shoes. •09260
  - 2.11 STUD TRACKS
    - 2.11.1 Floor and ceiling stud tracks shall be 22-ga. cold rolled steel with 1/2-inch legs and securely fastened to beams, slabs or partitions with 1/2-inch stud bolts or other method approved by manufacturer spaced not more than 24 inches on centers.
    - 2.11.2 In locations where drawings indicate partitions on an existing floor (wood, asphalt tile, etc.), remove existing floor to allow partition to be secured to a sound concrete sub-surface.
  - 2.12 STUD SHOES
    - 2.12.1 Stud shoes shall be wire tied to studs with two double strands of 18-ga. galvanized tie wire.
  - 2.13 HORIZONTAL BRACING
    - 2.13.1 Shall consist of 3/4-inch steel furring channels fastened to inside of stud with webs in a horizontal position. Spacing of channels shall not exceed 6 feet.
- 3.0 EXECUTION:
  - 3.1 Gypsum ceiling panels screw attached to metal furring channels clipped or wire tied to suspended main runner channels or wire tied to main support members.
  - 3.2 Provide control joints where ceiling abuts dissimilar wall or ceiling or a structural element.
  - 3.3 Gypsum wall panels shall be screwed to metal studs or furring channels and to and bottom metal track.

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- 3.4 All joints of ceiling or wall panels shall be taped with at least two coats of joint compound. See manufacturers instructions for applicable installation.
- 3.5 Align stud track accurately to the partition layout @ Both floor and Ceiling.
- 3.6 Adjust all members for straight and proper alignment.

**Tile Flooring**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of ceramic tile flooring, ceramic mosaic tile flooring, conductive ceramic tile flooring, quarry tile flooring, slate flooring, and quarry tile by the acid-resistant installation. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Glazed Ceramic Tile: ANSI A137.1.
  - 2.2 Ceramic Mosaic Tile: ANSI A137.1.
    - 2.2.1 Natural Clay Tile.
    - 2.2.2 Porcelain Body Tile.
    - 2.2.3 Slip-Resistant Tile: ANSI A137.1.
    - 2.2.4 Pregrouted Sheets of ceramic tile, factory-assembled and grouted with manufacturer's standard polyurethane material.
  - 2.3 Conductive Ceramic Tile: Complying with Type I, Class F.
  - 2.4 Quarry Tile: ANSI A137.1. Wax-coated top surface for acid-resistant installation.
    - 2.4.1 Slip-Resistant Quarry Tile shall comply with TCA ANSI A137.1, Section 5.2.1.2.9.
  - 2.5 Slate: Grade A, unfading slate flooring.
  - 2.6 Base Units: Cove type, round top.
  - 2.7 Trim Pieces: For base shall be cove or bullnose.
  - 2.8 Mortar and Grout Materials:
    - 2.8.1 Portland cement: ASTM C 150, Type 1.
    - 2.8.2 Aggregate: Sand, ASTM C 144.
    - 2.8.3 Dry-Set Mortar and Grout: ANSI A118.1, TCA Formula 759 or 763 (as applicable).
    - 2.8.4 Conductive Dry-Set Mortar: Conforming to ANSI A118.2.
    - 2.8.5 Conductive Latex Mortar: Conforming to ANSI A118.2.
    - 2.8.6 Liquid Latex: ANSI A118.4 except latex shall be non-remulsifiable in water.
    - 2.8.7 Epoxy Mortar and Grout: TCA Formula AAR-II, two-component epoxy resin, hardener, and mineral filler complying with ANSI A118.3.
    - 2.8.8 Furan Mortar.
    - 2.8.9 Furan Grout.
    - 2.8.10 Water shall be clean, fresh, potable water approved by Public Health authorities for domestic consumption.
    - 2.8.11 Commercial Cement Grout: Proprietary compound of Portland cement and additives, factory-blended to decrease shrinkage.
  - 2.9 Adhesives:
    - 2.9.1 Epoxy Adhesive: TCA Formula C150, two component epoxy resin and hardener.
    - 2.9.2 Organic Adhesive: ANSI A136.1 with TCA certification of conformance.
  - 2.10 Sealants:
    - 2.10.1 Polysulphide: Fed. Spec. TT-S-00230, Type I, single component, synthetic-rubber base.
    - 2.10.2 Polyurethane: Fed. Spec. TT-S-00230, Type I, single component.
    - 2.10.3 Silicone: Fed. Spec. TT-S-001543 Class A and TT-S-00230, single component.
  - 2.11 Adhesive and Joint Sealant: Fed. Spec. TT-S-00230, Type 2, Class B.
  - 2.12 Cleavage Membrane: One of the following:
    - 2.12.1 Saturated Felt: ASTM D 250, 15-pound type.
    - 2.12.2 Polyethylene Film: ASTM D 2103, Type O, 0.004 inch thick.
  - 2.13 Marble Thresholds: Group A per Marble Institute of America MIA-01, with rounded edges and sand rubbed finish.

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- 2.14 Reinforcing Mesh: ASTM A 185.
- 2.15 Plywood: DOC PS 1, "C-C EXT-APA" or "UNDERLAYMENT C-C Plugged EXT-APA," 3/4 inch thick unless otherwise noted.
- 2.16 Nails: Fed. Spec. FF-N-105 annular, screw or ring type, zinc-coated.
- 2.17 Backer Rod: Closed cell polymeric foam, with a density of 2.5 pcf and tensile strength of 35 psi per ASTM D 1623 and water absorption less than 0.02 gms/cc per ASTM C 1083.
- 2.18 Elastomeric Sheet: 40 mil complying with ASTM D 2103.
- 3.0 EXECUTION:
- 3.1 General: Comply with ANSI A108.1 through A108.7 except as otherwise indicated and with TCA Handbook for Ceramic Tile Installation.
- 3.2 Portland Cement Mortar Bed: Install in accordance with ANSI A108.1, as modified herein.
  - 3.2.1 Mix Mortar in proportion on one part Portland cement to five parts dry sand or six parts damp sand.
  - 3.2.2 On wood and framed concrete slab floors provide a cleavage membrane before placing setting bed, with edges of sheets lapped.
  - 3.2.3 On cleavage membrane lay welded wire mesh reinforcing, lapping three inches at all edges.
  - 3.2.4 Install mortar and tamp heavily to compact bed to depth of 3/4 inch to 1-1/4 inches.
- 3.3 Dry-Set Portland cement Mortar Bed: Install in accordance with ANSI A108.5 except as modified below.
  - 3.3.1 Carefully work sufficient water into dry-set mortar to obtain desired consistency.
  - 3.3.2 Mix mortar ingredients thoroughly before adding latex. Carefully work in sufficient latex to obtain desired consistency.
  - 3.3.3 Rework mixes from time to time to maintain proper consistency, but do not add additional ingredients.
  - 3.3.4 Apply layer of mortar to form a thickness of at least 1/8 inch.
- 3.4 Organic Adhesive Application: Install in accordance with ANSI A108.4.
- 3.5 Install conductive ceramic tile in accordance with ANSI A108.7.
  - 3.5.1 Testing: Conductive ceramic tile floors shall be tested in accordance with NFPA 99.
  - 3.5.2 Replacement: Floors that have not met requirements of NFPA 56 within six months after they are installed shall be removed and replaced with properly conductive floor by this Contractor at no additional cost to the Member.
- 3.6 Install quarry tile and slate in accordance with ANSI A108.3.

**Ceramic Wall Tile**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of ceramic wall tile. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Tile:
    - 2.1.1 Ceramic Tile: Tile shall be standard grade conforming to ANSI A137.1. Containers shall be grade-sealed. Seals shall be marked to correspond with the marks on the signed master grade certificate.
    - 2.1.2 Ceramic mosaic tile and trim shall be unglazed natural clay or porcelain with cushion edges. Tile size shall be 1 inch by 1 inch, 1 inch by 2 inches, 2 inches by 2 inches, or a mixture of standard sizes in a stock pattern, as selected.
    - 2.1.3 Glazed wall tile and trim shall be cushion-edged with bright or matte glaze. Tile shall be 4-1/4 inches by 4-1/4 inches, 4-1/4 inches by 6 inches, or 6 inches by 6 inches and, as selected.
    - 2.1.4 Accessories: Accessories shall be the built-in type of the same materials and finish as the wall tile.
  - 2.2 Setting Bed: Metal lath shall be flat expanded type conforming to ANSI A42.3 or A42.4, and weighing not less than 2.5 pounds per square yard.
  - 2.3 Water shall be potable.
  - 2.4 Mortar, grout, and adhesive shall conform to the following:
    - 2.4.1 Dry-Set Portland cement Mortar: ANSI A118.1.
    - 2.4.2 Organic Adhesive: ANSI A136.1, Type I.
    - 2.4.3 Epoxy Resin Grout: ANSI A118.3.

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2.4.4 Furan Resin Grout: ASTM C 395.

3.0 EXECUTION:

3.1 Preparation: Surface to receive tile shall conform to the requirements ANSI A108.1 for surface conditions for the type setting bed required and for workmanship.

3.2 Installation:

3.2.1 General: Special shapes shall be provided as required for sills, jambs, recesses, offsets, external corners, and other conditions to provide a complete and neatly finished installation.

3.2.2 Installation of Wall Tile:

3.2.2.1 Plastic or Cured Mortar Bed: Tile shall be installed over a plastic mortar bed or a cured mortar bed. A 4-mil polyethylene membrane, metal lath, and scratch coat shall also be installed. Plastic mortar bed, materials, and installation of tile shall conform to ANSI A108.1. Cured mortar bed and materials shall conform to ANSI A108.1. Dry-set mortar method of installing tile over a cured mortar bed shall conform to ANSI A108.5.

3.2.2.2 Dry-Set Mortar: Dry-set mortar shall be used to install tile directly over clean, sound, dimensionally stable masonry in accordance with ANSI A108.5. 3.2.2.3 Organic Adhesive: Organic adhesive installation of ceramic tile shall conform to ANSI A108.4.

3.3 Cleaning: Upon completion, tile surfaces shall be thoroughly cleaned in accordance with ANSI A108.1. Acid shall not be used for cleaning glazed tile.

**Terrazzo**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for terrazzo floors and stairs. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Terrazzo materials and installation shall comply with specifications and recommendations of The National Terrazzo and Mosaic Association, Inc. (NTMA)

2.2 Underbed reinforcement shall be 2-inch by 2-inch by 16-gauge welded wire mesh, ASTM A 185, galvanized.

2.3 Isolation membrane shall be polyethylene film, complying with ASTM D 2103, not less than 4.0 mils thick.

2.4 Cast-In-Place Terrazzo Materials:

2.4.1 Portland cement shall conform to ASTM C 150, Type I, except as modified to comply with NTMA requirements for compressive strength. Provide non-staining white cement for terrazzo matrix. Provide standard gray cement for underbed.

2.4.2 Sand shall conform to ASTM C 33.

2.4.3 Aggregate shall be natural, sound, crushed marble chips without excessive flats or flakes, complying with NTMA requirements.

2.4.4 Monolithic terrazzo shall be 1/2-inch total thickness over concrete slab.

2.4.5 Bonded terrazzo shall be 1/2-inch terrazzo over a 1-1/4 inch minimum underbed.

2.5 Thinset Epoxy and Polyester Materials:

2.5.1 Polyacrylate-Modified Cementitious Terrazzo Matrix: Polyacrylate and color pigment complying with NTMA "Guide Specification for Polyacrylate Modified Terrazzo."

2.5.2 Polyester Resin Terrazzo Matrix: Two-component polyester resin and hardener, mineral filler, and color pigment, complying with NTMA "Guide Specification for Polyester Terrazzo."

2.5.4 Epoxy Resin Terrazzo Matrix: Thermosetting, amine-cured epoxy resin and hardener, mineral filler, and color pigment, complying with NTMA "Guide Specification for Epoxy Terrazzo."

2.5.5 Conductive Terrazzo with Resinous Matrix: Electricity conductance shall conform to resistance levels established by the UL 779.

2.6 Precast Terrazzo: Precast terrazzo base and stair units shall comply with NTMA.

2.7 Sealer: Colorless, slip-and stain-resistant, non-yellowing penetrating sealer that will not disturb color or physical properties of terrazzo surface; pH factor between 7 and 10.

2.8 Plywood: DOC PS 1, "C-C EXT-APA" or "Underlayment C-C Plugged EXT-APA", 3/4 inch thick unless

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otherwise noted.

- 2.9 Nails: Fed. Spec. FF-N-105 annular, screw or ring type.
- 2.10 Elastomeric Sheet: 40 mil thick extruded, homogeneous, waterproof, impervious, nonplasticized chlorinated polyethylene sheet, complying with ASTM D 2103.
- 2.11 Curing Materials:
  - 2.11.1 Polyethylene Film: Non-staining type.
  - 2.11.2 Paper: Non-staining, heavy building paper.
  - 2.11.3 Curing Compound: Liquid membrane-forming compound, complying with ASTM C 309, Type I.
- 2.12 Cleaner: Neutral liquid chemical cleaner, biodegradable, free from crystalline salts, phosphate or water soluble alkaline salts, formulated for terrazzo, pH factor between 7 and 10.
- 3.0 EXECUTION:
  - 3.1 Preparation: Clean and prepare substrate to comply with NTMA specifications for type of terrazzo application indicated. Clean area to receive terrazzo of loose chips and all foreign matter. Grind concrete substrate as required to provide surfaces within tolerances required by NTMA.
  - 3.2 Installation:
    - 3.2.1 Comply with NTMA and manufacturer's recommendations for proportioning mixes, for installation of strips, and for placing, curing, grinding, grouting, and finishing.
    - 3.2.2 Provide terrazzo bases, thresholds, stair treads, and landings as required.
    - 3.2.3 Install divider and accessory strips in an adhesive setting bed, without voids below strips. Provide mechanical anchorage for adequate attachment of strips to substrate.
    - 3.2.4 Provide control joints by installing angle type divider strips back-to-back with neoprene rubber filler cemented between strips, flush with finish floor.
    - 3.2.5 Provide for expansion joints by installing angle type divider strips back-to-back, with removable filler of the width shown (but not less than 1/4 inch wide) between strips.
    - 3.2.6 Install abrasive inserts where required.

**Acoustical Ceilings**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of acoustical units in suspended ceilings. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Acoustical units shall conform to ASTM E 1264, Class A, and the following requirements:
    - 2.1.1 Acoustical panel units for exposed grid system shall be the type and pattern required, NRC grade of 55 minimum when tested on mounting No. 7, trimmed and butt, with a LR coefficient of .75 and a STC range of 40-44. Nominal size shall be 24 inches by 48 inches or 24 inches by 24 inches. Finish shall be factory-applied white finish.
    - 2.1.2 Acoustical panel units for semi-exposed grid system shall be the type and pattern required, NRC grade of 55 minimum when tested on mounting No. 7, trimmed and butt, with a coefficient of .75 and a STC range of 40-44. Nominal size shall be 12 inches by 24 inches or 12 inches by 12 inches. Finish shall be factory-applied white finish.
    - 2.1.3 Acoustical tile units for concealed grid system shall be the type and pattern as required, NRC grade of 55 minimum when tested on mounting No. 7. LR grade shall be 1, and STC range shall be 40-44. Edge detail shall be beveled or square, and joint detail shall be kerfed and rabbeted or as required. Nominal size shall be 12 inches by 12 inches, and finish shall be factory-applied white finish.
    - 2.1.4 Metal Ceiling System: Pans shall be type required, and acoustical insulation pads shall be NRC grade 55 minimum when tested on mounting No. 7. The pattern shall be "c," with a nominal size of 12 inches by 24 inches. Edge detail shall be manufacturer's standard, and joint detail shall be beveled or cross-scored to simulate 12-inch by 12-inch units. Finish shall be factory-applied white baked enamel, two coats on exposed surfaces, one coat on edges and backs. Pads shall be completed enclosed, of material and thickness required for acoustical and fire test ratings, with a LR grade of 2.
    - 2.1.5 Fire Resistive Ceilings: Acoustical fire resistive ceiling systems shall be rated for fire endurance

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- when tested in accordance with ASTM E 119. Suspended ceiling shall have been tested with a specimen roof and/or floor assembly representative of the construction, including 09510-mechanical and electrical work within ceiling space openings for light fixtures, air outlets, and access panels.
- 2.1.6 Ceiling sound transmission class and test: STC range of acoustical units, when required, shall be determined in accordance with Ceiling Sound Transmission Test by Two-Room Method and reported in accordance with the appendix to ASTM E 90 for 11 frequency data or ASTM E 413 for 16 frequency data.
  - 2.2 Suspension system shall be of the type required and shall conform to ASTM C 635 for intermediate- or heavy-duty systems. Surfaces exposed to view shall be aluminum or steel with a factory-applied white baked enamel finish, aluminum with a clear anodized finish as required or aluminum with colored factory-applied vinyl paint finish. Wall molding shall have a flange of not less than 15/16 inch and shall be provided with inside and outside corner caps.
  - 2.3 Hangers shall be galvanized steel wire. Hangers and attachment shall support a 300-pound vertical load without failure of supporting material or attachment.
  - 2.4 Access panels shall match adjacent acoustical tiles and shall be designed and equipped with suitable framing and fastenings for removal and replacement without damage. Panel shall be not less than 12 inches by 12 inches or more than 12 inches by 24 inches. An identification plate of 0.032-inch thick aluminum, 3/4 inch in diameter, stamped with the letters "AP" and finished the same as the unit shall be attached near on corner on the face of each access panel.
  - 2.5 Fire Hazard Classification: All acoustical unit materials shall bear the UL label and marking, indicating fire hazard classification of acoustical unit materials as determined by ASTM E 84. Provide materials with the following fire hazard classifications: Flame spread not more than 25. Smoke developed not more than 50.
  - 3.0 EXECUTION:
  - 3.1 Acoustical work shall be provided complete with all necessary fastenings, clips, and other accessories required for a complete installation. 3.2 Suspension System shall be installed in accordance with ASTM C 636 and as specified herein.
  - 3.3 Wall molding shall be provided where ceilings abut vertical surfaces.
  - 3.4 Ceiling Tiles: Panels in exposed-grid system shall be held in place with manufacturer's standard hold-down clips.

**Acoustical Insulation and Barriers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of acoustical insulation and barriers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Leaded vinyl shall be a loaded vinyl sound barrier product composed of lead, vinyl, and fiberglass reinforcing intended for use as a sound attenuation material. The material shall weigh either 72 or 120 ounces per square yard as required. Material thickness shall be 0.025 inch and 0.050 inch for 72 ounce and 120 ounce material, respectively.
- 2.2 Foil-reinforced, Kraft-faced, mineral-fiber insulation shall be a faced insulation product designed to be used for thermal and acoustical insulation. Mineral fiber insulation shall be in accordance with Fed. Spec. HH-I-558, Form A, Class 1 or 2. Noise reduction coefficient (NRC) shall be not less than 0.55 for 1-inch thickness. Vapor transmission rate shall be not more than 0.02 perms. Surface burning characteristics shall be not more than a flame spread classification of 25, a fuel contribution of 50, and a smoke developed rating of 50, when tested in accordance with UL 723.
- 2.3 Vapor barrier facing material shall be in accordance with ASTM C 1136, Type I or II as required. Facing material shall be a laminate of aluminum foil and reinforced-reinforced mineral fiber scrim.
- 2.4 Sheet lead shall be in acoustical attenuating product weighing 1 pound per square foot, with a thickness of not less than 1/64 inch. Lead sheet shall conform to Fed. Spec. QQ-L-201, Grade B.
- 2.5 Fire Hazard Classification: All acoustical insulation and barrier materials shall bear markings

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indicating the fire hazard classification as determined by ASTM E 84. Provide materials with the following fire hazard classifications: Flame spread not more than 25. Smoke developed not more than 50.

3.0 EXECUTION: (Section not used.)

**Sound Absorbing Panels**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of sound absorbing panels. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Perforated steel panels shall be modular units, fabricated of 22 gauge zinc-coated steel, and perforated with holes comprising not less than 10 percent of the panel area. Panels shall be suitably stiffened in both directions in accordance with panel size. Panels shall be filled with 2 inch thick, 1.5 lbs/cu ft acoustical insulation meeting Fed. Spec. HH-I-558, Form B, Type 1, Class 7. Installed panel units with acoustical insulation shall have a minimum Noise Reduction Coefficient (NRC) of .70 when tested in accordance with ASTM C 423. Panel units shall be furnished with two coats of white baked-on polyester paint on exposed surfaces and one coat on non-exposed surfaces.

2.2 Fiberglass wall panels shall be modular units, fabricated of 1-1/8 inch glass fiber board laminated to a nonwoven needle-punched fabric. The panels shall have a minimum NRC of .80 according to ASTM C 423. Panels shall be furnished with suitable wall fastening system.

2.3 Sound attenuation blankets shall be composed of mineral fiber of 4 lbs/cu ft density for 1 inch thickness, and 3 lbs/cu ft density for greater than 1 inch thickness conforming to ASTM C 665. Blanket R-value shall be 4 per inch.

2.4 Fire Hazard Classification: A sound absorbing panel unit and sound attenuation blankets shall have a fire hazard classification as determined by ASTM E 84. Provide materials with the following fire hazard classifications: Flame spread not more than 25. Smoke developed not more than 50.

3.0 EXECUTION:

3.1 Perforated steel panels shall be installed on ceiling suspension systems and wall furring systems that are compatible with perforated steel panels and that are already in place.

3.2 Fiberglass wall panels shall be installed on substrate wall surfaces that are clean, dry, and continuous, with no surface irregularities.

**Wood Strip Flooring**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of wood strip flooring. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Wood strip flooring shall be manufactured from kiln-dried, plain-sawed, red oak lumber. Flooring shall be select grade, tongue and groove, end-matched, with manufacturer's standard channeling of back face of each strip. Size shall be 3/4 inch thick, 2-1/4 inches wide.

2.2 Maximum moisture content shall be 9 percent for wood strip flooring and 14 percent for other wood members.

2.3 Finishing Materials for Job Finished Flooring:

2.3.1 Stain: Penetrating type non-fading wood stain.

2.3.2 Wood Filler: Fed. Spec. TT-F-336.

2.3.3 Sealer: Penetrating type, pliable, wood-hardening finish/sealer.

2.3.4 Varnish: Alkyd resin varnish.

2.3.5 Urethane Finish: Fed. Spec. TT-C-542.

2.3.6 Floor Wax: Liquid, solvent-type, slip-resistant, conforming to Fed. Spec. P-W-158.

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- 2.4 Composition Cork Expansion Strip: Fed. Spec. HH-C-576, Type I-B, Class 2.
- 2.5 Nails shall be Fed. Spec. FF-N-105 screw or ring type, zinc coated.
- 2.6 Asphalt primer shall comply with ASTM D 41.
- 2.7 Asphalt saturated felt shall be organic, 15-pound, unperforated, complying with ASTM D 226.
- 2.8 Membrane shall be 6 mil, carbonized polyethylene sheeting, complying with Fed. Spec. L-P-512.
- 2.9 Wood sleepers shall be No. 1 common, fir, hemlock, spruce, or yellow pine complying with requirements of the rules or standards under which produced with preservative treatment complying with AWPB LP-2.
- 2.10 Plywood subflooring shall be DOC PS 1, "C-D INT- APA," with exterior glue, or "C-C EXT-APA."
- 2.11 Hardboard shall comply with ANSI/AHA A135.4, specially made for underlayment, 1/4 inch thick.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Wood subfloors shall be renailed where loose. Where unsatisfactory wood subflooring is removed, replace with new exterior or underlayment grade plywood. Apply hardboard underlayment just before finish floor is to be installed. Nail plywood subfloors with screw-type nails. Cover ground in crawl space with lapped and sealed 4 mil polyethylene or 55-pound rolled roofing, and cover subfloor with a lapped layer of 15-pound asphalt saturated felt.
    - 3.1.2 Concrete Subfloors: Fill large cracks and holes in concrete structural floor slabs with a one part nonshrinking cement to three part sand grout with a latex or epoxy additive. Test for dryness with a 3 percent solution of phenolphthalein in grain alcohol (97 percent). Sand or trowel smooth irregularities to within allowable tolerances of NOFMA-01. Apply primer to concrete subfloors avoiding separating the emulsion. Apply two applications of hot asphalt mastic and asphalt saturated felt, then apply an additional layer of asphalt mastic. Provide flat 2 x 4 sleepers, 18 to 30 inches long impregnated with an approved wood preservative and laid in additional asphalt mastic; or apply a polyethylene sheet moisture protection system consisting of two courses of 1 x 2 nailing strips with a layer of polyethylene between, the first course being treated with preservative and adhered to the slab in rivers of mastic supplemented by a 1-1/2 inch concrete nail every 24 inches.
    - 3.1.3 Treated wood cuts shall be treated with the original preservative.
  - 3.2. Installation of Wood Strip Flooring:
    - 3.2.1 General: Comply with NOFMA-01.
    - 3.2.2 Expansion Space: For straight running pattern flooring and depending upon the width of pattern to be laid (usually the width of the room), provide approximately 1/2 inch of expansion space under base and base shoe along length of stripping, with approximately half as much space at ends of pattern.
    - 3.2.3 Machine sand installed unfinished flooring to remove offsets and non-level conditions.
    - 3.2.4 Field finish floors by applying a coat of wood paste filler and stain, if needed.
      - 3.2.4.1 Natural Finish: Apply two coats of sealer and two coats of floor wax.
      - 3.2.4.2 Varnish Finish: Apply three coats of floor varnish.
      - 3.2.4.3 Urethane Finish: Apply multiple coats of urethane finish to build a dry film thickness of 1.0 mil.

**Wood Block Industrial Flooring**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of wood block industrial flooring. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Wood block creosoted flooring shall be yellow pine, Douglas fir, or upland oak, preservative-treated, and in accordance with ASTM D 1031. Blocks shall be end-grain lumber with beveled corners and shall be 2, 2 1/2, or 3 inches thick, 3 inches wide, and 6 inches long.
  - 2.2 Wood block natural finish flooring shall be yellow pine or upland oak, preservative-treated. Wood blocks shall be of the species, quality, and size described in ASTM D 1031. Blocks shall be end-grain lumber with beveled corners and shall be 2 inches thick, 3 inches wide, and 6 inches long.
  - 2.3 Primer, adhesive, and filler shall be provided for wood block creosoted flooring.

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- 2.4 Flexible filler and clear industrial sealer and finish coating shall be provided for wood block natural finish flooring.
- 3.0 EXECUTION:
- 3.1 Preparation: Before any work under this section is begun, all defects such as rough or scaling concrete, low spots, high spots, and uneven surfaces shall have been corrected and all damaged portions of concrete slabs shall have been repaired. If concrete curing compounds or surface sealers have been applied to the concrete slabs, they shall have been entirely removed from the slabs.
- 3.2 Installation:
  - 3.2.1 For wood block creosoted flooring, a coat of priming oil shall be applied to the concrete slab. After the priming oil has dried, a squeegee coat of hot adhesive shall be applied. When the adhesive has hardened, the blocks shall be laid tightly together with the grain vertical. After the floor has been laid, two coats of filler shall be applied by squeegee. Expansion joints shall be provided.
  - 3.2.2 For wood block natural finish flooring, the joints shall receive filler and multiple coats of clear sealer and finish coating. Number of coats and method of application shall be adjusted to seasonal conditions.
- 3.3 Marking Lines: Floor surface in areas to receive lines shall be cleaned by scarification or by wire brushing. At least two coats of a marking material compatible with flooring materials shall be applied with suitable brush or spraying machine. The minimum total thickness of the marking lines shall be 4 mils.

**Wood Parquet Flooring**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of wood parquet flooring. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Wood parquet flooring shall be kiln-dried, plain-sawed, red oak.
  - 2.2 Laminated (plywood) wood block flooring shall be prime grade, 12-inch x 12-inch x 1/2-inch nominal size, with manufacturer's standard urethane floor finish. Flooring shall be tongue and grooved as required for laying in checkerboard pattern.
  - 2.3 Slat block flooring shall be clear grade, factory-prefinished with manufacturer's standard penetrating floor sealer treatment. Flooring shall be 9 inches x 9 inches x 5/16 inch, square pattern, tongue and groove, square edge matching. Pattern units of flooring shall be factory-assemble and adhered to removable paper facing for shipment to the project, or with slats fastened together with metal splines on backs.
  - 2.4 Solid Block Flooring: Wood parquet flooring shall be prefinished in factory. Flooring shall be prime grade, tongue and groove, square edge, matching.
  - 2.5 Plastic impregnated parquet flooring shall be manufacturer's standard fabrication of solid hardwood slat-block parquet flooring, which has been impregnated with acrylic plastic and treated by gamma radiation and factory-finished. Flooring shall be composed of 5/16-inch thick x 6-inch squares fabricated into 12-inch square blocks, square edged, tongued and grooved, with tongue and groove matching.
  - 2.6 Adhesive/mastic shall be polyvinyl acetate (PVA) or special mastic of type recommended by the flooring manufacturer and complying with flammability and environmental control regulations.
  - 2.7 Finish Materials for Unfinished Flooring:
    - 2.7.1 Stain: Penetrating type non-fading wood stain.
    - 2.7.2 Wood Paste Filler: Fed. Spec. TT-F-336, pigmented if required.
    - 2.7.3 Sealer: TT-S-176, Class I, for white oak and red oak, Class II for beech, birch, and hard maple.
    - 2.7.4 Varnish: Alkyd resin varnish conforming to Fed. Spec. TT-V-109.
    - 2.7.5 Polyurethane Finish: Moisture curing type, polyurethane finish conforming to Fed. Spec. TT-C-542.
    - 2.7.6 Floor Wax: Slip-resistant, conforming to Fed. Spec. P-W-158, Type I, Class 2.
  - 2.8 Composition Cork Expansion Strip: Fed. Spec. HH-C-576, Type I-B, Class 2.

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- 2.9 Nails and Screws shall be recommended by NOFMA-01.
- 2.10 Concrete Primer: ASTM D 41.
- 2.11 Asphalt-Saturated Felt: ASTM D 226.
- 2.12 Hardboard Underlayment: ANSI/AHA A135.4.
- 3.0 EXECUTION:
- 3.1 Preparation:
  - 3.1.1 For Adhesive Application on Concrete Slab: Test for dryness with a 3 percent solution of phenolphthalein in grain alcohol (97 percent), examine concrete surfaces and grind irregularities to within allowable tolerances of NOFMA-01, and apply primer to concrete subfloors.
  - 3.1.2 For Adhesive Application on Wood Subflooring or Underlayment: Preparation of subflooring or underlayment shall be in compliance with the printed instructions of the flooring manufacturer.
  - 3.1.3 For Nailed Application on Wood Subflooring or Underlayment: Cover subflooring with a layer of 15-pound asphalt-saturated felt, lap all edges at least 2 inches, and turn felt up at least 2 inches behind baseboards.
  - 3.1.4 For Plastic Impregnated Parquet Flooring: Patch and level concrete subfloors with porous latex cement patching compound. If parquet is to be installed over existing synthetic floor or tongue and grooved subfloor wider than three and one quarter inches, a 1/4-inch plywood or untempered hardboard underlayment.
- 3.2 Installation:
  - 3.2.1 General: Comply with recommendations and instructions by NOFMA in "Hardwood Flooring Installation Material" and by recommendation of American Parquet Flooring Association, Inc. Where flammable adhesives are used, provide safety sparkproof fans when natural ventilation is inadequate; prohibit smoking, lighting matches, metal heel caps, or any other flame or spark producing device.
  - 3.2.2 Installation of wood-block flooring on concrete slabs shall be by adhesive method.
  - 3.2.3 Installation on Wood Subflooring or Underlayment: Apply one layer of saturated felt over wood or underlayment in troweled adhesive, and apply wood blocks with at least two 7-penny spiral or screw type flooring nails per block.
  - 3.2.4 Installation of Plastic Impregnated Parquet Flooring: Install with special adhesive.
  - 3.2.5 Sanding: Machine sand installed unfinished flooring to remove offsets and non-level conditions.
  - 3.2.6 Field Finishing:
    - 3.2.6.1 Base Finish: On same day that final sanding, buffing, and sweeping have been completed, apply a coat of wood paste filler. Apply stain if needed, then apply two coats of sealer.
    - 3.2.6.2 Natural Finish: When floors are dry apply two coats of wax.
    - 3.2.6.3 Varnish Finish: Apply 3 coats of floor varnish.
    - 3.2.6.4 Urethane Finish: Apply urethane finish to build a dry film thickness of 1.0 mil.

**Softwood Flooring**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of softwood flooring. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Douglas Fir Wood Strip Flooring, kiln-dried, vertical grain, complying with the requirements of WCLB for Grade C and better flooring.
  - 2.2 Southern Pine Wood Strip Flooring, kiln-dried, edge grain, complying with the requirements of SPIB for Grade C and better.
  - 2.3 Matching: Tongued and grooved, and end matched.
  - 2.4 Pressure Treatment: Where flooring is exposed to the exterior, provide AWPB LP-2 pressure treatment after manufacture of flooring, followed by drying to required moisture content.
- 3.0 EXECUTION:
  - 3.1 Plank Flooring: For strip flooring of face width over 3-1/4 inches (plank flooring), install two counter-set nails at each end of each piece and spaced not more than 32 inches along length of

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each piece. Fill holes with matching wood filler.

- 3.2 Treated Wood: Whenever treated wood flooring must be cut for installation, treat the cut with the preservative used in the original treatment immediately after cutting.

**Resilient Flooring: Cementitious Underlayment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of cementitious underlayment for resilient flooring. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Cementitious underlayment shall be one of the following factory-mixed types.
  - 2.1 Magnesium Type: Mixture of sand, magnesium, cement, and/or gypsum. Add water before using.
  - 2.2 Latex Type: Mixture of sand, cement, and latex in dry form to which water is added on the job, or two component type in which latex is added as a liquid on job.
  - 2.3 Polyvinyl Acetate Type: Polyvinyl acetate resins, cement, gypsum, and sand mixtures.
  - 2.4 Epoxy Type: Two-component epoxy type that merely requires mixing of the two parts in compliance with manufacturer's instructions.
  - 2.5 Oxychloride Type: Mixture with cement and with or without magnesium.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 On wood subfloors, lay 15-pound saturated felt in opposite direction to floor boards. Lap edges three inches.
    - 3.1.2 Place metal lath nailed at 6-inch centers over felt.
  - 3.2 Installation:
    - 3.2.1 Install cementitious underlayment in strict compliance with instructions for the type of system used.
    - 3.2.2 Where feather edges less than 1/4 inch thick are required, use a latex type underlayment for such thin parts of the underlayment.
    - 3.2.3 On concrete surfaces apply latex or polyvinyl acetate liquid as a bonding agent before installing underlayment.

**Resilient Flooring**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of resilient flooring. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Critical Radiant Flux: Resilient flooring material shall have an average critical radiant flux of 0.45 watts per square centimeter when tested in accordance with NFPA 253.
  - 2.2 Resilient Tile Flooring:
    - 2.2.1 Asphalt Tile: Fed. Spec. SS-T-312, Type I, 9 inches by 9 inches by 1/8 inch thick.
    - 2.2.2 Homogeneous Vinyl Tile: Fed. Spec. SS-T-312, Type III, 12 inches by 12 inches by 1/8 inch thick.
    - 2.2.3 Rubber Tile: Fed. Spec. SS-T-312, Type II, 12 inches by 12 inches by 1/8 inch thick.
  - 2.3 Resilient Sheet Flooring:
    - 2.3.1 Sheet Vinyl Flooring: Fed. Spec. L-F-475, Type II, Grade A, thickness 0.085 inch, with organic backing, not less than 72 inches wide.
    - 2.3.2 Sheet Rubber Flooring: Solid, integrally colored, 36-inch wide; thickness 1/8 inch.
  - 2.4 Base: Provide base complying with Fed. Spec. SS-W-40, either Type I rubber or Type II vinyl with matching end stops and preformed or molded corner units, with a 4 inch height, 1/8-inch gauge thickness, and standard top-set cove style.
  - 2.5 Resilient Stair Treads: Provide rubber or vinyl stair tread units, full tread width, not less than 1/8 inch at tapered end and 1/4 inch at nosing, with two abrasive strip inserts full width of treads, and curved nosings 1-1/2 inches high.
    - 2.5.1 Resilient Stair Base: Provide rubber or vinyl base, 7-inch cove type, for stair risers to match treads.

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- 2.5.2 Resilient Stringer Skirt: Cut to match riser and tread profile to meet wall base height.
- 2.6 Resilient edge strips shall be 1/8 inch thick, homogeneous vinyl or rubber composition, tapered or bullnose edge, not less than 1 inch wide.
- 2.7 Metal edge strips shall be of width shown and of required thickness to protect exposed edge of resilient flooring. Provide units of maximum available length to minimize number of joints.
- 2.8 Adhesives:
  - 2.8.1 Asphalt Emulsion: Clay type, Fed. Spec. MMM-A-115, Class 1.
  - 2.8.2 Asphalt Emulsion: Chemical type, Fed. Spec. MMM-A-115, Class II.
  - 2.8.3 Asphalt: Cutback type, Fed. Spec. MMM-A-110.
  - 2.8.4 Adhesives (Cements): As recommended by flooring manufacturer to suit material and substrate conditions.
  - 2.8.5 Cove Base Adhesive: Resin base waterproof adhesive with high initial tack.
  - 2.8.6 Lining Felt Adhesive: Fed. Spec. MMM-A-137.
- 2.9 Concrete Slab Primer: Non-staining type.
- 2.10 Asphaltic Slab Primer: Fed. Spec. SS-A-701.
- 2.11 Wax: Fed. Spec. P-W-155.
- 2.12 Latex Underlayment: One-component or two-component factory mixed product containing powdered or liquid latex, cement, and other powders.
- 2.13 Smooth-Lining Felt:
  - 2.13.1 Semi-Saturated Felt: Designed for application with vinyl floor covering materials, minimum weight of 0.75 lbs./sq. yd.
  - 2.13.2 Asphalt Saturated Organic Felt: ASTM D 226, 15-pound plain.
- 2.14 Crack Filler: Type and brand recommended by floor covering manufacturer.
- 2.15 Hardboard: AHA A135.4, untempered type specially made for use as underlayment, 3/16 inch or 1/4 inch thick.
- 2.16 Plywood: DOC PS 1, "C-C EXT-APA" or "UNDERLAYMENT C-C Plugged EXT-APA," 3/4 inch thick unless otherwise noted for subfloors and 1/4 inch thick for underlayment.
- 2.17 Nails: Fed. Spec. FF-N-105, annular, screw, or ring type.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Concrete Floor Surfaces: Fill large cracks and holes in concrete structural floor slabs with one part nonshrinking cement to three part sand grout with a latex or epoxy additive. Level floors and fill small cracks and holes in concrete or underlayment with a commercial latex or epoxy floor patching compound.
    - 3.1.2 Wood Floor Surfaces: Fill knot holes, cracks wider than 1/8 inch, and holes larger than 1/4 inch in diameter with a crack filler as specified for this application. All ridges or other uneven surfaces shall be planed, scraped, or sanded smooth. Nail heads shall be set. Renail wood underlayment and subfloors where loose using annular or ring type coated nails. Remove and replace rotted, broken, or otherwise unsatisfactory wood subflooring and all other defective materials with new exterior grade plywood of equivalent thickness.
  - 3.2 Installation:
    - 3.2.1 Environmental Conditions: Spaces in which flooring work is to be performed shall be maintained between 70 F and 90 F at the floor level for at least 48 hours prior to starting the work, during the time work is performed, and for at least 48 hours after the work is completed. A minimum temperature of 55 F shall be maintained thereafter. Adequate ventilation shall be provided to remove moisture and fumes from the area.
    - 3.2.2 Lay Tile From Center Marks established with principal walls, discounting minor offsets, so that tiles at opposite edges of the room are of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room axis, unless otherwise indicated.

**Fluid-applied Resilient Flooring**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of fluid-applied resilient flooring. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product

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manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Polyurethane Elastomer Flooring:

2.1.1 Polyurethane elastomer flooring shall be a poured-in-place urethane recreational type flooring surface system composed of a two-part urethane component system. Components shall be blended and poured as a liquid onto a prepared base. Primer material to provide adhesion of the polyurethane to the base shall be as recommended by the flooring manufacturer. Line paints shall be polyurethane. Flooring color, thickness, durometer hardness, and painted lines shall be as required.

2.1.2 Physical Properties: Material weight shall be approximately 0.83 pound per square foot per 1/8-inch thickness. Tensile strength shall be 200-600 psi in accordance with ASTM D 412. Hardness range shall be 55-65 Shore A-2 in accordance with ASTM D 2240. Elongation shall be limited to 150-350 percent in accordance with ASTM D 412. Compression set shall be 90 percent immediate recovery after 72 hours at 50 percent compression at 72 F in accordance with ASTM D 395. The material shall provide complete resistance to fungus.

3.0 EXECUTION: Base surface preparation shall be in strict accordance with polyurethane flooring manufacturer's recommendations. Cracks and construction joints shall be filled flush with materials recommended by the manufacturer.

**Conductive Vinyl Tile Flooring**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of conductive vinyl tile flooring. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Certificate of Conductance: Submit one copy of certificate signed by the Contractor, stating: "Conductive floors were tested by method prescribed in ANSI/UL 779 and were found to have a resistance of less than 1,000,000 ohms and greater than 25,000 ohms."

2.2 Conductive Vinyl Tile: Floor covering shall be of solid, unlaminated construction, manufactured from highest grade materials, with surface smooth, and free from foreign matter. Tile shall be resistant to the action of acids and other materials normally encountered in operating rooms. Tile shall comply with Fed. Spec. SS-T-312, Type III and shall be listed by Underwriters' Laboratories, Inc. Elements of tile shall be so proportioned that the electrically conductive components will not be more than 1/4 inch apart on the top surface. The tile flooring shall have an average critical radiant flux of 0.45 watts per square centimeter when tested in accordance with NFPA 253.

2.2.1 Tile Size: 1/8 inch by 12 inch by 12 inch tiles, micro- squared to ensure tight joints.

2.2.2 Slab Size: 1/8 inch by 36 inch by 36 inch slabs.

2.3 Conductive Adhesive: A two-part chemically setting, water- resisting, epoxy adhesive specially formulated for installing conductive vinyl tile. Adhesive shall form a conductive field under tile without use of copper foil strips.

2.4 Epoxy caulking cement used to seal the perimeter joint shall be a material recommended by the manufacturer of the flooring.

3.0 EXECUTION:

3.1 Conductive tile shall be installed by experienced mechanics under the supervision of factory-approved personnel. Install with conductive adhesive. Complete electrical grounding in compliance with the manufacturer's instructions.

3.2 Lay tile from center marks established with principal walls, discounting minor offsets, so that tile at opposite edges of the room are of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room axis, unless otherwise directed.

3.3 Cleaning: Three days after installation, conductive vinyl tile flooring shall be cleaned thoroughly. Do not apply wax to conductive flooring.

3.4 Testing: After completion of installation, conductive vinyl tile floors shall be tested by qualified

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technicians employed by the Contractor. Test shall be done in presence of the Authorized Member Representative. Testing procedure shall comply with ANSI/UL 779.

**Carpeting**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of carpeting. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Carpet Cushions:
    - 2.1.1 Rubberized Fiber-Hair Cushion: Burlap fabric reinforcing between top and bottom feltings of blended India jute fiber and new animal hair, less than 90 percent fiber and more than 10 percent hair, 5 oz/sq yd or more of rubberized coating on top surface and on bottom surface complying with Fed. Spec. DDD-C-001023, Type II. Weight shall be 39 oz/sq yd.
    - 2.1.2 Ripple-Type Rubber: Sponge or foam rubber, molded with a rippled or waffled bottom surface, with an adhered top reinforcement of burlap or other fabric complying with Fed. Spec. ZZ-C-00811, Type I, Class 1 (firm), 1/4 inch thick.
    - 2.1.3 High-Density Foam: Open-cell, homogenized latex-rubber, compounded for maximum moisture and aging resistance with ash and filler content not exceeding 50 percent, skinned-over on bottom surface, reinforced on top surface with an adhered fabric. Waffle pattern shall comply with Fed. Spec. ZZ-C-00811, Type I, Class 1, 1/4 inch thick.
    - 2.1.4 Rebonded Polyurethane: Manufacturer's standard formulation of polyurethane foam and binders, to produce a flat carpet cushion complying with Fed. Spec. L-C-001676, Class I, 3/8 inch thick.
  - 2.2 Carpet:
    - 2.2.1 Carpet Fiber (Filament) and Yarn: Fed. Spec. DDD-C-95.
      - 2.2.1.1 Wool: Natural, long staple, virgin wool carpet fiber, not less than 97 percent pure; permanently treated for resistance to insects and mildew.
      - 2.2.1.2 Continuous Hollow Nylon: Continuous multiple hollow-core filament, of manufacturer's standard denier, texturized or crimped for "bulk", delustered with maximum of 15 percent delustrant.
      - 2.2.1.3 Continuous Multilobal Nylon: Continuous nylon filament, of approximately 18 denier, in tri-lobal or similar cross section (not round or ovular), texturized for "bulk."
      - 2.2.1.4 Continuous Round Nylon: Continuous round nylon filament, of not less than 15 denier, texturized or crimped for "bulk," delustered with maximum of 15 percent delustrant.
      - 2.2.1.5 Continuous Nylon: Continuous nylon filament of type recommended by carpet manufacturer, approximately 15 denier, texturized or crimped for "bulk," delustered.
      - 2.2.1.6 Staple Nylon: Long staple (approximately 7 inches) nylon fiber, of varying denier and crimp to resemble natural wool, delustered.
      - 2.2.1.7 Acrylic: Long staple (approximately 7 inches) acrylic fiber, of not less than 15 denier average, crimped to increase "bulk."
      - 2.2.1.8 Modacrylic: Long staple (approximately 7 inches) modified acrylic fiber, modified to increase melting temperature, of not less than 15 denier average, crimped to increase "bulk."
      - 2.2.1.9 Bi-Component Acrylic: Long staple (approximately 7 inches) 2-component acrylic fiber with differential shrinkage characteristic, which imparts spiral crimp for very high "bulk."
      - 2.2.1.10 Polypropylene: Continuous polypropylene (olefin) filament, of 15 denier minimum, textured for "bulk."
      - 2.2.1.11 High-Denier Polypropylene: Continuous filament or long staple polypropylene (olefin) fiber, of 75 denier minimum, textured for bulk, produced specifically for felted or needle punched construction of carpet.
      - 2.2.1.12 Polyester: Long staple (approximately 7 inches) fiber, of 15 denier minimum, textured for "bulk," specifically compounded for high stain resistance.
      - 2.2.1.13 Nylon-Reinforced Vinyl: Continuous filament nylon thread, coated with vinyl to form a carpet yarn, produced specifically for woven (non-pile) carpet construction.
      - 2.2.1.14 Stain-Resistant Polyester: Long staple (approximately 7 inches) fiber, of 15 denier minimum, unless otherwise indicated, textured for "bulk," specifically compounded for high stain resistance.

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- 2.2.1.15 Destatic Fiber: Metallic carpet fiber, of stainless steel, aluminum, or other metal, either coated or plain, proven by test of round nylon filament pile carpet to be effective in controlling the static buildup in persons to below 3,000 volts when used in one of the following blends of fiber with ambient condition of 20 percent relative humidity and 70 F temperature, with oak-tanned, leather-soled shoes: a. 0.33 percent of stainless steel filament. b. 3.0 percent blend of plastic coated aluminum filament.
- 2.2.1.16 Pile Yarn, General: Provide yarn spun in manner recommended by yarn manufacturer and carpet manufacturer.
- 2.2.2 Carpet Construction:
  - 2.2.2.1 General: Fabricate carpet by the construction method used in manufacturer's standard process.
  - 2.2.2.2 Pile Density; Pitch and Rows: Fabricate carpet with the spacing of tufts both ways, uniformly spaced by manufacturer's standard method.
  - 2.2.2.3 Variation of Yarn and Density: Wherever the texture or pattern of the completed carpet is not affected and also wherever the effect produced is acceptable to the Authorized Member Representative, the carpet manufacturer may (at his option) vary both the denier of the yarn and the density of the tufts, provided the product of the two remains constant and equal to the product of yarn denier and tuft density indicated (equal density factor maintained.)
  - 2.2.2.4 Pile Height: Provide pile height as designated.
  - 2.2.2.5 Primary Backing for Tufting: Provide manufacturer's standard backing material, but not less than one of the following:
    - 2.2.2.5.1 Polypropylene: Woven polypropylene fabric weighing not less than 3.2 oz/sq yd.
    - 2.2.2.5.2 Plastic Fabric: A non-woven fabric of 75 percent polypropylene fibers and 25 percent other plastic fibers, weighing not less than 4.0 oz/sq yd.
    - 2.2.2.5.3 Jute: Woven jute fabric, weighing not less than 9.0 oz/sq yd.
  - 2.2.2.6 Adhesive Binding for Tufting: Provide manufacturer's standard liquid latex or other resinous coating as required to produce the tuft bind strength indicated, but not less than 20 oz coating/sq yd.
  - 2.2.2.7 Backing for Woven Carpet: Provide manufacturer's standard shot (weft), chain (warp), filler, and stuffer yarns, of jute, Kraft cord, cotton, or synthetic fibers. Provide the number of yarns per row or pitch of pile as indicated or, if not indicated, provide manufacturer's standard arrangement as needed for strength and to make up the required carpet weight, but provide not less than 2 shot yarns (3 Axminster) and double chain yarn. Provide woven-through-the-back construction.
  - 2.2.2.8 Back Coating for Woven Carpet: Provide manufacturer's standard liquid latex or other resinous coating, but not less than 10 oz/sq yd.
  - 2.2.2.9 Backing for Knitted Carpet: Provide manufacturer's standard chain (warp) yarns of cotton or synthetic fibers and filler yarns of jute or Kraft cord. Provide the number of yarns per row or pitch as indicated or, if not indicated, provide manufacturer's standard arrangement as needed for strength and to make up the required carpet weight, but not less than double chain yarns and double overlapping filler yarns.
  - 2.2.2.10 Back Coating for Knitted Carpet: Liquid latex or other resinous coating, shall be more than 14 oz/sq yd.
  - 2.2.2.11 Backing for Fusion-Bonded Carpet: Provide manufacturer's standard jute or synthetic fabric backing with latex or vinyl plastic coating for fusion-bonding of face pile.
  - 2.2.2.12 Backing for Needle-punched Carpet: Type and weight designated or, if not designated, manufacturer's standard backing fabric produced specifically for needle-punching and felting of staple fibers to produce carpet, complying with Fed. Spec. DDD-C-001173 for construction of needle-punched carpet.
  - 2.2.2.13 Secondary Fabric Backing: Provide, as a minimum, 8-ounce burlap or jute fabric, laminated to carpet with liquid latex adhesive, to achieve a stripping bond of not less than 2.0 lbs in. (Fed. Std. 191).
- 2.2.3 Dyeing Method: Carpet shall meet the requirements of both the wet-method color fastness rating of "Good" or better, per Fed. Spec. DDD-C-95, evaluated by Method 5610 of Fed. Std. 191 and the fade resistance established by the Association of Textile Chemists and Colorists for carpet when tested on the Atlas Fadeometer for the number of hours indicated. If method of dyeing and fade

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- resistance are not indicated, use manufacturer's standard method, as needed to achieve a fade resistance of 40 hours.
- 2.2.4 Flame Spread: Carpet shall comply to UL 992 flame propagation index of less than 4.0 and Fed. Std 372, minimum average critical radiant flux of 0.50 watts per square centimeter. Carpet shall pass the methamine tablet test per DOC-FF-1-70 (pill test).
  - 2.3 Bonded Cushion Carpet:
    - 2.3.1 High Density Foam Backing: Open-cell homogenized latex-rubber compound for maximum moisture and aging resistance, with ash or filler content not exceeding 50 percent, skinned-over on exposed surface, complying with Fed. Spec. DDD-C-95, Class I, 38 oz/sq yd, 1/8 inch thick. Compression resistance shall be 5 pounds minimum. Compression set shall be 15 percent maximum. Provide special formulation, tested with carpet for flame spread rating of less than 75 when by the tunnel test of ASTM E 84, or flame propagation index of less than 4.0 when tested by the UL chamber test, UL 992. Carpeting and cushion shall be tested together.
    - 2.3.2 Primary Backing: Polypropylene weighing 3.5 oz/sq yd minimum.
    - 2.3.3 Bonded Cushion Backing: Provide cushion bonded to carpet to achieve a stripping bond of not less than 2.0 lbs/in (Fed. Std. 191A), either cured-in-place or laminated sheet stock. At manufacturer's option, back coating used as tuft binding may be decreased or eliminated with the use of cured-in-place backing, provided required tuft bind strength is achieved.
  - 2.4 Adhesive for Carpet: Waterproof, release type adhesive as recommended by the carpet manufacturer or cushion manufacturer. Provide adhesive that complies with flame spread rating required for the carpet installation, if any.
  - 2.5 Adhesive for Seams: Waterproof, nonstaining adhesive furnished or recommended by the carpet manufacturer that complies with flame spread rating required for the carpet.
  - 2.6 Carpet Edge Guard: Bend-down type of formed or extruded aluminum carpet edge guard stripping. Form units with concealed teeth to grip the carpet from below.
  - 2.7 Tackless Carpet Stripping: Water-resistant plywood stripping, with angular pins protruding from the top. Provide stripping with 2 rows of pins wherever the carpet width is less than 20 feet and with 3 rows of pins wherever carpet width is 20 feet or more. Provide prenailed stripping, ready for anchorage to concrete or similar substrate.
  - 2.8 Tape:
    - 2.8.1 Cushion Tape: Singel Face cloth, 2 inches wide.
    - 2.8.2 Carpet Tape: Double-face cloth, 2 inches wide.
    - 2.8.3 Seam Tape: Paperback, for latex sewing, 4 inches wide.
    - 2.8.4 Seam Tape: Heat bonding, 4 inches wide.
  - 2.9 Seam Thread: No. 18 waxed linen.
  - 2.10 Masonry Nails: No. 9 (0.148 inch x 1 inch) hardened masonry nails, Fed. Spec. FF-N-105.
  - 2.11 Latex Underlayment: One- or two-component, factory-mixed product containing powdered or liquid latex, cement, and other powders.
  - 2.12 Crack Filler: Type and brand recommended by carpeting manufacturer.
  - 2.13 Hardboard: AHA A135.4, untempered type specially made for use as underlayment, 3/16 inch or 1/4 inch thick.
  - 2.14 Plywood: DOC PS 1, "C-C EXT-APA" or "UNDERLAYMENT C-C Plugged EXT-APA", 3/4 inch thick unless otherwise noted for subfloors and 1/4 inch thick for underlayment.
  - 2.15 Nails: Fed. Spec. FF-N-105 annular, screw or ring type.
  - 3.0 EXECUTION:
    - 3.1 Preparation:
      - 3.1.1 Fill large cracks and holes in concrete structural floor slabs with a one-part, nonshrinking cement to three-part sand grout with a latex or epoxy additive. All ridges or other uneven surfaces shall be ground smooth; chalky or dusty surfaces shall be primed.
      - 3.1.2 Level floors and fill small cracks and holes in concrete or underlayment with a commercial latex or epoxy floor patching compound.
      - 3.1.3 Wood Floor Surfaces: Knot holes, cracks wider than 1/8 inch, and holes larger than 1/4 inch in diameter shall be filled with a crack filler as specified for this application. All ridges or other uneven surfaces shall be planed, scraped, or sanded smooth.
      - 3.1.4 Wood underlayment and subfloors shall be renailed where loose.

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- 3.1.5 Rotted, broken or otherwise unsatisfactory wood subflooring and all other defective materials shall be removed and replaced with new.
- 3.1.6 Undercut wood door bottoms as required to allow clear door swing over newly carpeted areas.
- 3.2 Installation:
  - 3.2.1 Install carpet edge guard at every location where edge of carpet is exposed to traffic, except where another device, such as an expansion joint cover system or threshold, is indicated with an integral carpet binder bar.
  - 3.2.2 Installation On Stairs: Install carpet by nailing or other secure method recognized to be durable and safe for traffic on stairs. Conceal edges. Avoid seams at points of high wear (nosings and treads). Cushion on stairs shall be twice the thickness of cushions on floor.

**Magnesium Oxychloride Flooring**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of magnesium oxychloride flooring and base. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Magnesium Oxychloride Composition: Manufacturer's standard product shall comply with Mil. Spec. MIL-D-16680. Color to be used will be selected by the Authorized Member Representative from manufacturer's standard colors.
    - 2.1.1 Mixing Solution: Magnesium chloride flake in a 22 degree Baume solution.
    - 2.1.2 Physical Properties when tested in compliance with Mil. Spec. MIL-D-16680:  
Fire Resistance: Incombustible  
Water Absorption: Less than 7 percent  
Abrasion Resistance: 0.072 inch  
Impact Resistance: 0.031 inch; no chipping, crackling or detachment.
  - 2.2 Saturated Felt: ASTM D 250, 15-pound type.
  - 2.3 Expanded Metal Lath: Fed. Spec. QQ-L-101, diamond mesh pattern, expanded copper alloy steel, weighing 3.4 pounds per square yard. 2.4 Bonding Agent: Trowel-applied bonding medium made by manufacturer of magnesium chloride.
- 3.0 EXECUTION:
  - 3.1 Environmental Conditions: Installation shall not be started unless ambient temperature of area in which the work occurs is at least 50 F and rising and is maintained above 50 F without interruption while the work is being done and for at least three days after the completion of the work.
  - 3.2 Preparation:
    - 3.2.1 Concrete floors shall be clean and free from all grease, dirt, paint, and all other foreign matter and shall be completely dry prior to flooring installation. 3.2.2 Wood Floors shall be structurally sound, firmly nailed, free of vibration, and broom clean. Lay felt over wood in opposite direction to joints in wood and overlap edges 3 inches.
  - 3.3 Installation: Apply flooring and base to a uniform 1/2-inch thickness and steel-trowel to a uniform smooth density. Where cover base is installed over wood, trowel material on metal lath. Light traffic may be permitted 24 hours after installation and heavy traffic after 3 to 5 days.

**Epoxy Flooring**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of epoxy flooring. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 General: Component materials for any one flooring type shall be from a single manufacturer. Cove bases of flooring material shall be provided if required.
  - 2.2 Epoxy quartz chip flooring shall be decorative floor surfacing system consisting of primer; topping including epoxy resin, hardener, and ceramic-coated quartz aggregate; and finish coat or coats.

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Topping, including aggregate, when tested in accordance with referenced standards, shall have a compressive strength of 9,800 psi (ASTM C 579), a flexural strength of 6,000 psi (ASTM C 580), a bond strength of 400 psi (ACI 503, Appendix A), and a water absorption rate of 0.06 percent (ASTM C 413). Tests of chemical resistance of cured resin, when immersed for 7 days in reagents, shall show no effect from ammonium hydroxide, carbon tetrachloride, citric acid, dimethyl formamide, formaldehyde (3 percent), heavy-duty detergent, heptane, hydrogen peroxide (28 percent), lactic acid, oleic acid, phenol solution, sodium carbonate (20 percent), sodium chloride (10 percent), sodium hydroxide (60 percent), sodium hypochlorite, sulfuric acid (30 percent), and urine.

- 2.3 Epoxy flooring shall be industrial floor surfacing system consisting of primer; topping including epoxy resin, hardener, coloring agent, and selected fine aggregates; and finish coat or coats. Physical properties of topping, including aggregate, when tested in accordance with referenced standards, shall have a compressive strength of 7,500 psi (ASTM C 579), a tensile strength of 1,750 psi (ASTM C 307), a flexural strength of 3,000 psi (ASTM D 790), and a maximum thermal coefficient of linear expansion of 20 by 10<sup>-6</sup> in/in/degrees F (ASTM D 696). The extent of burning shall be 0.25 inches maximum (ASTM D 635). Minimum bond strength shall be 200 psi, with 100 percent concrete failure (ACI 503, Appendix A). Abrasive resistance shall be 0.20 grams maximum (ASTM D 1044, 1,000 Grams, 1,000 Cycles). Impact strength, except topping bonded to concrete, shall be 0.05, with no chipping, cracking, or detachment of surfacing from concrete (MIL-D-3134, Para. 4.7.3). Tests of chemical resistance of cured resin when immersed 7 days in reagents, shall show no effect from acetic acid (5 percent), ammonium hydroxide (10 percent), citric acid (50 percent), cola syrup, fatty acid, motor oil (20W), hydrochloric acid (10 percent), salt water, sodium hydroxide (10 percent), sulfuric acid (10 percent), trisodium phosphate (5 percent), and water (distilled). There shall be only slight softening from ethyl alcohol (95 percent), jet fuel JP-4C, and mineral spirits. There shall be no effect but slight stain from nitric acid (10 percent).
- 2.4 Chemical-resistant epoxy flooring shall be chemical-resistant floor surfacing system consisting of primer; topping including epoxy resin, hardener, coloring agent, and selected fine aggregates; and finish coat or coats. Topping, including aggregate, when tested in accordance with referenced standards, shall have a compressive strength of 9,500 psi (ASTM C 579), a flexural strength of 2,080 psi (ASTM C 580), an impact strength of 120 in. lbs (ASTM D 2794), a bond strength of 400 psi (ACI 503, Appendix A), and a water absorption rate of 0.04 percent (ASTM C 413). Tests of chemical resistance of cured floor surfacing system, when immersed for 7 days in reagents listed, shall show no effect from acetic acid (100 percent), chromic acid (10 percent), citric acid (20 percent), formaldehyde (37 percent), heavy-duty detergent, hydrochloric acid (37 percent), hydrogen peroxide (28 percent), lactic acid (85 percent), mineral spirits, nitric acid (40 percent), oleic acid, oxalic acid (10 percent), phosphoric acid (85 percent), potassium hydroxide (50 percent), sulfuric acid (75 percent), tannic acid (20 percent), tartaric acid (10 percent), and urine.
- 2.5 Epoxy terrazzo flooring shall be decorative floor surfacing consisting of primer, thermosetting epoxy resin matrix, decorative mineral aggregate, epoxy grout, and sealer. Heavy brass, 1/4-inch divider strips, and expansion joints shall also be provided as required. Materials shall conform to applicable National Terrazzo and Mosaic Association (NTMA) publications. Flooring, when tested in accordance with the standards, shall show no toxicity. Epoxy terrazzo flooring shall be self-extinguishing when tested in compliance with ASTM D 635.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Concrete surfaces shall comply with ASTM C 811 unless otherwise indicated or required by manufacturers' instructions.
    - 3.1.2 Wood floors shall have contaminants removed by sanding, solvent cleaning, detergent cleaning, or other methods as required.
    - 3.1.3 Primer shall be applied over prepared substrate.
  - 3.2 Installation:
    - 3.2.1 Epoxy quartz chip flooring, epoxy flooring and chemical-resistant epoxy flooring shall have a topping mix of aggregates and/or fillers trowel-applied to the following thicknesses:
      - a. Epoxy quartz chip flooring: 1/4 inch.

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- b. Epoxy flooring: 3/16 inch.
- c. Chemical-resistant epoxy flooring: 1/4 inch.

Finish or sealing coat or coats shall be applied after topping mix has cured. Floor system shall be applied to wall surfaces at locations indicated to form base with cove of radius and height designated. All interior and external corners of base shall be rounded.

3.2.2 Epoxy terrazzo flooring shall be applied according to NTMA recommendations and as follows. A 1/4-inch thick aggregate/filler topping mix and recommended curing compound shall be applied and the surface shall then be ground, rinsed, grouted, and reground. Finish or sealing coat or coats shall be applied after topping mix has cured. Floor system shall be applied to wall surfaces at locations designated to form base with cove of radius and height indicated. All interior and external corners of base shall be rounded.

**Conductive Elastomeric Liquid Flooring**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of conductive elastomeric liquid flooring. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Carbon black shall comply with ASTM D 561.
  - 2.2 Acrylic/urethane shall be water dispersed acrylic resin mixed with dry components and aggregates. Material shall comply with Mil. Spec. MIL-D-3134. Factory pre-mixed with carbon black.
  - 2.3 Acrylic shall be modified high strength acrylic resin mixed with dry component powders with tensile strength of 4,890 psi, bond strength of 290 psi, and flexural strength of 1,650 psi, minimums, complying with Mil. Spec. MIL-D-3134.
  - 2.4 Neoprene rubber shall be water-phase neoprene rubber composition complying with NTMA Specifications, with tensile strength of 245 psi, bond strength to concrete of 255 psi, and compressive strength of 2,600 psi, minimums.
  - 2.5 Latex shall be specially formulated, emulsion resin mixed with dehydrated powders. Comply with Paragraphs 3.4 through 3.22 of Mil. Spec. MIL-D-3134, except Paragraph 3.7 shall not apply.
  - 2.6 Epoxy emulsion shall be 100 percent non-volatile, thermosetting, two-part epoxy resin matrix with tensile strength of 4,000 psi, bond strength of 200 psi, and compressive strength of 14,000 psi.
    - 2.6.1 Water-emulsified epoxy resin shall have the following characteristics:
      - Viscosity: 180 centipoises at 25 C.
      - Specific weight: 9.2 pounds per gallon.
      - Color: opaque white.
      - Solids (minimum): 59 percent.
      - Stable after five freeze-thaw cycles.
    - 2.6.2 Water emulsified hardener shall have the following characteristics:
      - Viscosity: 160-190 centipoises at 50 C.
      - Specific weight: 8.6 pounds per gallon.
      - Solids (minimum): 75.0 percent.
      - Stable after five freeze-thaw cycles.
  - 2.7 Polyacrylate: A polyacrylate hydraulic cement copolymer and dry coreactant composite shall comply with requirements of Mil. Spec. MIL-D-3134.
  - 2.8 Polyester: Thermosetting polyester topping resin, catalyst, and premixed fillers shall have tensile strength of 5,000 psi, compressive strength of 14,000 psi, and bond strength of 200 psi, minimums.
  - 2.9 Fillers: Inert mineral or cellulosic material best suited for the resin binders shall be used. Filler in quantity necessary to impart required physical characteristics shall be furnished with particle size not greater than 3/16 inch in any dimension and shall contain sufficient fines to provide an even-textured, nonslip type of surface on the finished topping.
  - 2.10 Primer shall be material that will penetrate into pores of substrate. Primer shall bond with topping to form a permanent monolithic bond between the substrate and the topping.

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3.0 EXECUTION:

- 3.1 Environmental Conditions: Elastomeric liquid flooring installation shall not be started unless ambient temperature of area in which the work occurs is at least 50 F. and rising, and is maintained above 50 F. without interruption while the work is being done and for at least three days after the completion of the work.
- 3.2 Installation Over Wood Floors: Renail wood subfloors where loose, using annular or ring type zinc-coated nails. Remove and replace rotted, broken, or otherwise unsatisfactory wood subflooring and all other defective materials.
- 3.3 Installation Over Concrete Floors: Roughen surfaces that are glossy, painted, or have loose surface material. Fill large cracks and holes.
- 3.4 Cleaning: Thoroughly clean all surfaces to receive flooring to remove all grease, oil, wax, dirt, dust, and other foreign matter.
- 3.5 Topping: Install topping 1/8 inch thick for epoxy type and 1/8 to 3/8 inch thick for other types.
- 3.6 Bases shall be cover type cast-in-place with 1-inch radius cove and shall be 6 inches high.
- 3.7 Finish or sealer coat shall be applied.
- 3.8 Testing: After completion of installation, test conductive floors. Test must prove that conductive floors comply with all requirements of ANSI/UL 779.

**Heavy-duty Concrete Floor Topping**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of heavy-duty concrete floor topping. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Portland cement: Comply with ASTM C 150, Type I or Type III.
  - 2.2 Aggregate: Selected, clean, hard, and tough material, either crushed or natural, as approved by the Authorized Member Representative. Trap rock, granite, quartz, corundum, or manufactured products such as silicon carbide or heat-treated aluminum oxides are acceptable. They shall comply, in all respects except gradation, with ASTM C 33.
  - 2.3 Water shall be clean, fresh, potable water approved by public health authorities for domestic consumption.
- 3.0 EXECUTION:
  - 3.1 Preparation: Roughen surfaces of present concrete that are glossy, painted, or have loose surface material. Clean and sweep thoroughly to remove all grease, oil, wax, dirt, sand, dust, and all other foreign matter.
  - 3.2 Installation: Nominal mixture shall be one part of Portland cement, one part of fine aggregate, and two parts of coarse aggregate by volume. Not more than four gallons of mixing water shall be used for each bag of Portland cement in the mixture. Mixing of concrete shall continue for at least one minute after all ingredients are in mixer.

**Brick Flooring**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of brick flooring. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Brick Materials:
    - 2.1.1 Light Traffic Paving Brick: ASTM C 902, Class SX, MX, or NX, Type I, II, or III, Application PS, PX, or PA.
    - 2.1.2 Chemical-Resistant Brick: Solid brick, ASTM C 279, Type H or L.
    - 2.1.3 Industrial Floor Brick: Solid brick, ASTM C 410, Type T, H, M, or L.
    - 2.1.4 Base: Matching base shall be provided at walls and vertical elements, including stretcher units, internal and external corners, stops, and other locations as required. Type shall be square-top

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- cove, round-top cove, or turn-up base.
- 2.1.5 Lining units shall be brick units matching floor brick for lining pits and trenches and for curbs and pads occurring in floor brick field. Provide special trim shapes for continuous coverage of substrates.
- 2.1.6 Temporary Coating: Wax shall be compatible with cleaning method required to remove wax without damage to grout or brick.
- 2.2 Setting Materials:
  - 2.2.1 Mortarless Applications:
    - 2.2.1.1 Roofing Felt: ASTM D 226, 15-pound asphalt-saturated felt.
    - 2.2.1.2 Fine Aggregate for Setting Bed: ASTM C 144 or stone screenings.
    - 2.2.1.3 Sand for Joints: ASTM C 144, free of clay particles. •09750
  - 2.2.2 Portland cement Applications:
    - 2.2.2.1 Portland cement: ASTM C 150, Type I, natural color or white, to produce the required color of mortar or grout.
    - 2.2.2.2 Aggregate: ASTM C 144 or C 404, or both.
    - 2.2.2.3 Liquid Admixture for Setting Bed and Grout: Liquid latex mortar additive with a compressive strength of 3,000 psi, bond strength of 500 psi, no loss in strength when exposed to ozone for 200 hours at an ozone concentration of 200 pphm and water absorption of 4 percent maximum.
    - 2.2.2.4 Bond Coat Admixture: High strength liquid latex mortar additive with a compressive strength of 5,000 psi, bond strength of 500 psi, tensile strength of 500 psi, no loss in strength when exposed to ozone for 200 hours at 200 pphm, and water absorption of 4 percent maximum.
    - 2.2.2.5 Pigments: Commercial iron oxide, manganese dioxide, ultra-marine blue, chromium oxide, or carbon black, suitably compounded for use in mortar mixes.
    - 2.2.2.6 Water: Clean and free of deleterious materials that would impair strength or bond.
  - 2.2.3 Chemical-Resistant Mortar and Grout:
    - 2.2.3.1 Sulfur Mortar: ASTM C 287, with silica or carbon filler.
    - 2.2.3.2 Resin Mortar: Liquid resin and filler material shall comply with ASTM C 395. Resin shall be phenolic, furan, polyester, epoxy, or vinyl ester. Filler shall be silica or carbon.
    - 2.2.3.3 Resin Grout: ASTM C 658, epoxy or furan.
    - 2.2.3.4 Chemical-Resistant Membrane: Multiple component asphaltic system consisting of asphalt primer and bituminous-coated glass fiber cloth embedded in hot-melt asphalt compound.
    - 2.2.3.5 Expansion Joint Filler: Elastomeric sealant of type recommended and produced by mortar/grout manufacturer for type of application indicated. Include primer and backer rod where required.
  - 2.2.4 Miscellaneous Materials:
    - 2.2.4.1 Cleavage Membrane: 15-pound asphaltic felt, ASTM D 226, Type I, or 4-mil polyethylene sheeting, ASTM C 171.
    - 2.2.4.2 Setting Bed Reinforcement: 2 inches by 2 inches, 16/16, welded wire fabric.
    - 2.2.4.3 Sealer: Phenolic type or acrylic base non-slip material.
- 3.0 EXECUTION:
  - 3.1 Expansion and Control Joints: Provide sealant-filled joints at locations and widths required. Install expansion joint filler where sealant type joints are required in chemical-resistant flooring.
  - 3.2 UngROUTED Mortarless Brick Flooring:
    - 3.2.1 Cushioning Material: Install roofing felt, two layers with edges butted to achieve uniform thickness, and fine aggregate setting bed screeded to depth required.
    - 3.2.2 Lay bricks and fill joints with sand. After all bricks are in place and all joints are filled, remove excess sand.
  - 3.3 Latex-Modified Portland cement Applications:
    - 3.3.1 Apply cement slush coat not to exceed 1/16 inch thickness.
    - 3.3.2 Mix Portland cement, sand, and liquid admixture.
    - 3.3.3 Spread and screed setting bed to uniform thickness at sub grade elevations required.
    - 3.3.4 Place brick before initial set of cement occurs. Tamp and beat bricks to obtain full contact with setting bed.
    - 3.3.5 Grout joints as soon as possible after initial set of setting bed and cure grout.
  - 3.4 Chemical-resistant sulfur mortar applications shall comply with ASTM C 287 unless otherwise

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directed.

- 3.5 Chemical-Resistant Resin Mortar Applications:
  - 3.5.1 Bricklaying: Except as otherwise directed, bricklaying shall comply with ASTM C 399.
  - 3.5.2 Tile Setting: Except as otherwise directed, tile setting shall comply with ANSI/ASTM C 723.
  - 3.5.3 Chemical-Resistant Membrane: Provide chemical-resistant asphaltic membrane system over concrete substrates under chemical-resistant mortar applications where directed.
  - 3.5.4 Set Bricks on Vertical Surfaces in compliance with ASTM C 399, using either resin mortar or sulfur as bed joint material, as required.
- 3.6 Chemical-Resistant Cement Mortar and Resin Grout Applications:
  - 3.6.1 Application of brick in hydraulic cement mortar setting bed shall comply with ASTM C 398. Grouting joints with resin grout shall comply with ASTM C 723, unless otherwise directed.
  - 3.6.2 Install cleavage membrane as required.
  - 3.6.3 Reinforce setting bed with welded wire fabric as required.

**Light-duty Brick Flooring**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of light-duty brick flooring. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Floor Brick (Brick Pavers): ASTM C 62, Grade SW, solid uncured brick, 1-1/4 inches thick by 3-1/4 inches by 8 inches.
  - 2.2 Paving Brick: ASTM C 902, solid uncured brick of size selected by the Authorized Member Representative.
  - 2.3 Masonry Mortar: ASTM C 270, Type M.
  - 2.4 Portland cement: ASTM C 150, Type I.
  - 2.5 Aggregate for Masonry Mortar: ASTM C 144.
  - 2.6 Hydrated Lime: ASTM C 207, Type S.
  - 2.7 Aggregate for Cement Setting Beds: Sand as recommended in ASTM C 404.
  - 2.8 Aggregate for Grout: Sand as recommended in ASTM C 404.
  - 2.9 Pigments: Inert mineral oxides or carbon black.
  - 2.10 Sand Setting Bed: ASTM C 33.
  - 2.11 Commercial Cement Grout: Proprietary compound of Portland cement and additives.
  - 2.12 Cleavage Membrane: 15-pound asphalt felt or 4-mil polyethylene sheeting.
  - 2.13 Setting Bed Reinforcement: 2-inch by 2-inch, 16/16, welded wire fabric, ASTM A 185.
- 3.0 EXECUTION:
  - 3.1 General Requirements: Do not use brick with chips, cracks, voids, discolorations, and other defects. Cut brick shall have clean, sharp, unchipped edges. Use full units without cutting wherever possible. Set brick with uniform joints.
  - 3.2 UngROUTED Applications: Place sand setting bed and compact by tamping. Set brick closely together, and sweep fine sand over surface to fill joint irregularities.
  - 3.3 Portland cement Applications:
    - 3.3.1 Preparation of Subbase: Clean subbase to remove dirt, dust, debris, and loose particles.
    - 3.3.2 Install cleavage membrane and provide folded membrane material at overlapping edges to form lock joints.
    - 3.3.3 Apply slush coat of cement grout over surface of concrete subbase about 15 minutes prior to placing setting bed.
    - 3.3.4 Setting Bed: Mix one bag of Portland cement to 3 cu. ft. of sand. Use only enough water to produce a moist surface when setting bed is ready for setting of brick. Install reinforcing mesh if over a wood substrate.
    - 3.3.5 Wet brick several hours before laying. Do not lay bricks with free water on the surface.
    - 3.3.6 Set brick before initial set of cement bed occurs. Do not set brick on dry bed. Set and level each brick immediately.

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- 3.3.7 Grout joints as soon as possible after initial set of setting bed. Force grout into joints, strike flush, and tool slightly concave.
- 3.3.8 Use Portland cement Grout mixed in the proportion of one bag of Portland cement to 2 cu. ft. of sand mixed with water to the consistency of heavy cream.
- 3.4 Masonry Mortar Applications:
  - 3.4.1 Mix mortar to comply with ASTM C 270 proportion specifications for Type "M" mortar.
  - 3.4.2 Install Brick in bed joints of mortar with vertical joints filled with mortar. Remove excess mortar promptly as the work progresses.
  - 3.4.3 Strike joints flush with top surface of brick and tool slightly concave.
- 3.5 Pointing: During the tooling of joints, enlarge voids or holes and completely fill with mortar or grout.
- 3.6 Cleaning: Remove excess mortar/grout from exposed brick surfaces, wash, and scrub clean. Rinse with clean water.
- 3.7 Sealing and Waxing: After cleaning, apply a neutral sealer to brick flooring, and when dry, apply a suitable floor wax recommended for brick floors.

**Standard Floor Treatment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for standard floor treatments for terrazzo, ceramic tile, oxychloride, concrete, and resilient flooring. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Cleaning Compound: A liquid chemical cleaner containing non-ionic and anionic type detergents, non-reactive to flooring. Compound shall have no free metal alkalis, no artificial coloring, and no fatty acids. Compound shall be UL listed as "slip-resistant."
  - 2.2 Stripper: An ammoniated stripper that will penetrate and loosen wax films without damaging flooring. Stripper shall be non-flammable and phosphate-free with a flash point of none to boiling.
  - 2.3 Wax: Water-emulsion type, self polishing, made from 100 percent No. 1 prime Carnuba wax, UL listed as "slip-resistant."
  - 2.4 Polish: Metal cross-linked copolymer, slip-resistant polish. Polish shall dry to clear gloss without buffing.
  - 2.5 Sealer: Penetrating type seal that will fill pores and leave a clear, hard, non-flaking, non-tracking finish. Sealer shall be UL listed as to slip resistance.
- 3.0 EXECUTION:
  - 3.1 Preparation and Installation:
    - 3.1.1 Terrazzo and Oxychloride Floors:
      - 3.1.1.1 Clean floors with a neutral liquid cleaner with pH factor as near seven as possible.
      - 3.1.1.2 Apply two coats of sealer, and buff with electric polishing machine.
    - 3.1.2 Ceramic Tile Floors: Scrub thoroughly using a neutral liquid cleaner, and apply one coat of penetrating sealer.
    - 3.1.3 Concrete Flooring:
      - 3.1.3.1 Scrub thoroughly using a neutral liquid cleaner. Apply stripper to remove stubborn grease, waxes, and polishes.
      - 3.1.3.2 When floor is clean and dry, apply two coats of penetrating sealer.
    - 3.1.4 Resilient Flooring:
      - 3.1.4.1 Scrub with a light solution of neutral chemical cleaner. Use a stripper to remove build-up of old wax and polishes. Rinse clean, and allow to dry.
      - 3.1.4.2 Apply two coats of wax and machine polish.

**Floor Treatment: Non-slip Coatings on Concrete Floors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for non-slip coatings on concrete floors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance

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- with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: A combination of pigmented two-part high solids urethane resin and a select gradation of sand shall be used. Color shall be selected from manufacturer's standard colors.
  - 2.1 Tensile Strength and Elongation: Tensile strength shall be 580 psi, and elongation shall be 57 percent, all complying with ASTM D 412.
  - 2.2 Water Absorption: Coatings shall not absorb water, in accordance with ASTM D 570.
  - 2.3 Coefficient of friction shall comply with ASTM D 1894.
  - 2.4 Abrasion resistance shall be ASTM D 1044 Taber Abraser, H-18 wheel, 1 kg load. Weight loss shall be 0.20 grams after 1,000 cycles.
  - 2.5 Impact shall be by a 2-pound falling ball at 150 inch-pounds pressure, 0.05 inch maximum indentation with no cracking.
  - 2.6 Chemical resistance shall be non-staining to most common chemicals, such as 10 percent acetic acid, 10 percent citric acid, 10 percent sodium hydroxide, and ethyl alcohol.
  - 3.0 EXECUTION: Concrete floors shall be either acid etched or sand blasted. Surface to be coated shall be clean, dry, and free from surface contaminants.

**Exterior Painting**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and application of paint to exterior surfaces. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Application procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Painting materials for the exterior surfaces indicated shall conform to the following Federal and Military Specifications:
  - 2.1 Concrete: TT-P-19 Paint, Acrylic Emulsion, Exterior
  - 2.2 Concrete Masonry Units: TT-F-1098 Filler, Block, Solvent-Thinned, for Porous Surfaces (Concrete Block, Cinder Block, Stucco, Etc.). TT-P-19 Paint, Acrylic Emulsion, Exterior. TT-P-96 Paint, Latex Base, Exterior. TT-P-97 Paint, Styrene-Butadiene Solvent Type, White (for Exterior Masonry).
  - 2.3 Stucco: TT-F-1098 Filler, Block, Solvent- Thinned, for Porous Surfaces (Concrete Block, Cinder Block, Stucco, Etc.). TT-P-19 Paint, Acrylic Emulsion, Exterior. TT-P-96 Paint, Latex Base, Exterior. TT-P-97 Paint, Styrene-Butadiene Solvent Type, White (for Exterior Masonry).
  - 2.4 Asbestos Cement: TT-P-19 Paint, Acrylic Emulsion, Exterior
  - 2.5 Wood, Unpainted: TT-P-001984 Primer Coating, Latex Base, Exterior (Undercoat for Wood), White and Tints. MIL-P-28582 Primer Coating, Exterior, Lead Pigment-Free (Undercoat for Wood, Ready-Mixed, White and Tints).
  - 2.6 Wood, Primed: TT-P-19 Paint, Acrylic Emulsion, Exterior. TT-P-31 Paint, Oil: Iron-Oxide, Ready-Mixed, Red and Brown. TT-P-37 Paint, Alkyd Resin, Exterior Trim, Deep Colors. TT-P-102 Paint, Oil, Alkyd Modified, Exterior, White and Tints. TT-P-1510 Paint, Latex, Exterior, for Wood Surfaces, White and Tints
  - 2.7 Wood, Decks and Porches, Primed and Unpainted: TT-E-487 Enamel: Floor and Deck.
  - 2.8 Wood, to Receive Stain: TT-S-708 Stain, Oil; Semi-Transparent, Wood, Exterior. TT-S-001992 Stain, Latex, Exterior for Wood Surface.
  - 2.9 Concrete Walls and Floors of Swimming Pools: TT-P-95 Paint, Rubber: For Swimming Pools and Other Concrete and Masonry Surfaces. 2.10 Ferrous Metals, Ungalvanized and Unpainted. TT-P-86 Paint, Red-Lead-Base, Ready-Mixed. TT-P-645 Primer, Paint, Zinc-Chromate, Alkyd Type.
  - 2.11 Ferrous Metals, Galvanized but Unpainted: TT-P-641 Primer Coating: Zinc Dust-Zinc Oxide (for Galvanized Surfaces). MIL-P-26915 Primer Coating, Zinc Dust Pigmented, for Steel Surfaces.
  - 2.12 Ferrous Metals, Primed: TT-E-489 Enamel, Alkyd, Gloss (for Exterior and Interior Surfaces). TT-E-1593 Enamel, Silicone Alkyd Copolymer, Gloss (for Exterior and Interior Use). TT-P-31 Paint, Oil: Iron-Oxide, Ready-Mixed, Red and Brown. TT-P-37 Paint, Alkyd Resin, Exterior Trim, Deep Colors. TT-P-38 Paint, Aluminum, Ready-Mixed. TT-P-102 Paint, Oil, Alkyd Modified, Exterior, White and Tints.
  - 2.13 Aluminum or Aluminum Alloy, Unpainted: TT-P-645 Primer, Paint, Zinc-Chromate, Alkyd Type.

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- 2.14 Aluminum or Aluminum Alloy, Primed: TT-E-489 Enamel, Alkyd, Gloss (for Exterior and Interior Surfaces). TT-E-1593 Enamel, Silicone Alkyd Copolymer, Gloss (for Exterior and Interior Use).
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Concrete, Concrete Masonry Units and Stucco: Remove all glaze, efflorescence, laitance, dirt, grease, oil, asphalt, surface deposits of iron, and other foreign matter. Apply a filler to areas of irregular surface profile.
    - 3.1.2 Asbestos Cement: Remove stains with solvent. Do not wire brush.
    - 3.1.3 Wood: Clean off foreign matter. On seasoned knots, scrape, clean, and apply thin coat of knot sealer. Scrape off or remove pitch with mineral spirits or turpentine. Set nails and prime and fill nail holes and other surface imperfections with putty, exterior spackling compound, or plastic wood filler. Allow to dry and sand smooth.
    - 3.1.4 Ferrous Metals, Ungalvanized: If not shop-coated, solvent clean. Remove loose rust, mill scale, and other foreign matter by power wire brushing or sandblasting to the degree specified on the drawings.
    - 3.1.5 Ferrous Metals, Galvanized, and Aluminum and Aluminum Alloy: Solvent clean and treat with vinyl type wash coat conforming to Mil. Spec. DOD-P-15328.
    - 3.1.6 Removal of Paints Containing Lead or Other Contaminants: All work associated with the removal of paints containing lead or other contaminants shall be in accordance with 29 CFR 1910 and 29 CFR 1926 (including all sub parts). The Contractor shall submit for approval a detailed lead protection program, accident prevention plan, respiratory protection plan, airborne sampling plan, and containment plan for all work involving lead paint removal. These submittals shall define all measures that are to be taken to ensure that workers and the environment will be protected during the progress of the work.
  - 3.2 Application: Provide complete hiding and uniform thickness of coats. All paints shall be applied and allowed to cure in accordance with the manufacturer's recommendations. All surfaces not scheduled to receive paint shall be protected from overspray. Clean-up of over sprayed areas shall be at the contractor's expense.
    - 3.2.1 Concrete Masonry Units: Apply filler coat to bare concrete masonry units and allow to dry. Follow with finish coats.
    - 3.2.2 Wood to Receive Paint: Prime bare wood prior to application of finish coats.
    - 3.2.3 Ferrous Metals: Prime bare metal prior to application of finish coats. Vinyl paints shall be spray applied at a total coating thickness of 7 mils (3 coats minimum).
    - 3.2.4 Aluminum and Aluminum Alloy: Prime bare metal prior to application of finish coats.

**Interior Painting**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and application of paint to interior surfaces. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Application procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work. 2.0 PRODUCTS: Painting materials for the interior surfaces indicated shall conform to the following Federal and Military Specifications.
  - 2.1 Concrete:
    - 2.1.1 Walls and Nontextured Ceilings: TT-E-508 Enamel, Interior, Semigloss, Tints and White. TT-E-509 Enamel, Odorless, Alkyd, Interior, Semigloss, White and Tints. TT-E-545 Primer (Enamel-Undercoat, Alkyd, Odorless, Interior, Flat, Tints and White). TT-P-29 Paint, Latex Base, Interior, Flat, White and Tints. TT-P-30 Paint, Alkyd, Odorless, Interior, Flat, White and Tints. TT-P-95 Paint, Rubber: For Swimming Pools and Other Concrete and Masonry Surfaces. TT-P-1511 Paint, Latex (Gloss and Semigloss, Tints and White) (for Interior Use).
    - 2.1.2 Textured Ceilings: TT-C-555 Coating, Textured (for Interior and Exterior Masonry Surfaces).
    - 2.1.3 Floors: TT-P-91 Paint, Rubber-Base, for Interior Use (Concrete and Masonry Floors).
  - 2.2 Concrete Masonry Units: TT-C-535 Coating, Epoxy, Two Component, for Interior Use on Metal, Wood, Wallboard, Painted Surfaces, Concrete, and Masonry. TT-C-542 Coating, Polyurethane, Oil-Free, Moisture Curing. TT-C-550 Coating System Glaze, High Performance, (Solvent Base) for

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- Interior Surfaces. TT-E-505 Enamel, Odorless, Alkyd, Interior, High Gloss, White and Light Tints. TT-E-506 Enamel, Alkyd, Gloss, Tints and White (for Interior Use). TT-E-508 Enamel, Interior, Semigloss, Tints and White. TT-E-509 Enamel, Odorless, Alkyd, Interior, Semigloss, White and Tints. TT-E-545 Primer (Enamel-Undercoat, Alkyd, Odorless, Interior, Flat, Tints and White). TT-F-1098 Filler, Block, Solvent-Thinned, for Porous Surfaces (Concrete Block, Cinder Block, Stucco, Etc.). TT-P-29 Paint, Latex Base, Interior, Flat, White and Tints. TT-P-30 Paint, Alkyd, Odorless, Interior, Flat, White and Tints. TT-P-95 Paint, Rubber: For Swimming Pools and Other Concrete and Masonry Surfaces. TT-P-1511 Paint, Latex (Gloss and Semigloss, Tints and White) (for Interior Use).
- 2.3 Asbestos Cement: TT-E-508 Enamel, Interior, Semigloss, Tints and White. TT-E-509 Enamel, Odorless, Alkyd, Interior, Semigloss, White and Tints. TT-E-545 Primer (Enamel-Undercoat, Alkyd, Odorless, Interior, Flat, Tints and White). TT-P-29 Paint, Latex Base, Interior, Flat, White and Tints. TT-P-30 Paint, Alkyd, Odorless, Interior, Flat, White and Tints. TT-P-1511 Paint, Latex (Gloss and Semigloss, Tints and White) (for Interior Use).
- 2.4 Gypsum Wallboard and Plaster: TT-C-535 Coating, Epoxy, Two Component, for Interior Use on Metal, Wood, Wallboard, Painted Surfaces, Concrete, and Masonry. TT-C-542 Coating, Polyurethane, Oil-Free, Moisture Curing. TT-C-550 Coating System Glaze, High Performance, (Solvent Base) for Interior Surfaces. TT-E-505 Enamel, Odorless, Alkyd, Interior, High Gloss, White and Light Tints. TT-E-506 Enamel, Alkyd, Gloss, Tints and White (for Interior Use). TT-E-508 Enamel, Interior, Semigloss, Tints and White. TT-E-509 Enamel, Odorless, Alkyd, Interior, Semigloss, White and Tints. TT-E-545 Primer (Enamel-Undercoat, Alkyd, Odorless, Interior, Flat, Tints and White). TT-P-29 Paint, Latex Base, Interior, Flat, White and Tints. TT-P-30 Paint, Alkyd, Odorless, Interior, Flat, White and Tints. TT-P-650 Primer Coating, Latex Base, Interior, White (for Gypsum Wallboard). TT-P-1511 Paint, Latex (Gloss and Semigloss, Tints and White) (for Interior Use). TT-S-179 Sealer Surface: Pigmented Oil for Plaster and Wallboard.
- 2.5 Wood Other Than Floors:
- 2.5.1 Painted Surfaces: TT-E-505 Enamel, Odorless, Alkyd, Interior, High Gloss, White and Light Tints. TT-E-506 Enamel, Alkyd, Gloss, Tints and White (for Interior Use). TT-E-508 Enamel, Interior, Semigloss, Tints and White. TT-E-509 Enamel, Odorless, Alkyd, Interior, Semigloss, White and Tints. TT-E-545 Primer (Enamel-Undercoat, Alkyd, Odorless, Interior, Flat, Tints and White). TT-P-29 Paint, Latex Base, Interior, Flat, White and Tints. TT-P-1511 Paint, Latex (Gloss and Semigloss, Tints and White) (for Interior Use).
- 2.5.2 Stained, Varnished, or Natural Finishes Surfaces: TT-S-176 Sealer, Surface, Varnish Type, Floor, Wood and Cork. TT-S-711 Stain; Oil Type, Wood, Interior. TT-V-85 Varnish, Oil, Low Sheen, Brush or Spray Application. TT-V-109 Varnish, Spar, Alkyd-Resin. TT-V-119 Varnish, Spar, Phenolic-Resin. TT-V-121 Varnish, Spar, Water-Resisting.
- 2.5.3 Furniture: TT-S-711 Stain; Oil Type, Wood, Interior. TT-V-86 Varnish, Oil, Rubbing (for Metal and Wood Furniture).
- 2.6 Wood Floors:
- 2.6.1 Painted Surfaces: TT-E-487 Enamel: Floor and Deck.
- 2.6.2 Stained or Natural Finished Surfaces: P-W-155 Wax, Floor, Water-Emulsion. P-W-158 Wax, General Purpose, Solvent Type. TT-C-542 Coating, Polyurethane, Oil-Free, Moisture Curing. TT-S-176 Sealer, Surface, Varnish Type, Floor, Wood and Cork.
- 2.7 Ferrous Metals:
- 2.7.1 Ungalvanized and Unpainted: TT-P-86 Paint, Red-Lead-Base, Ready-Mixed. TT-P-615 Primer Coating: Basic Lead Silico Chromate, Ready Mixed. TT-P-645 Primer, Paint, Zinc-Chromate, Alkyd Type. TT-V-51 Varnish: Asphalt.
- 2.7.2 Galvanized but Unpainted: DOD-P-15328 Primer (Wash), Pretreatment, (Formula No. 117 for Metals) (Metric).
- 2.7.3 Primed: TT-E-489 Enamel, Alkyd, Gloss (for Exterior and Interior Surfaces). TT-E-505 Enamel, Odorless, Alkyd, Interior, High Gloss, White and Light Tints. TT-E-506 Enamel, Alkyd, Gloss, Tints and White (for Interior Use). TT-E-508 Enamel, Interior, Semigloss, Tints and White. TT-E-509 Enamel, Odorless, Alkyd, Interior, Semigloss, White and Tints. TT-E-545 Primer (Enamel-Undercoat, Alkyd, Odorless, Interior, Flat, Tints and White). TT-P-30 Paint, Alkyd, Odorless,

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Interior, Flat, White and Tints. TT-P-38 Paint, Aluminum, Ready-Mixed.

- 2.8 Fire Retardant Paint:
  - 2.8.1 Non-Metallic Surfaces: TT-P-26 Paint, Interior, White, Tints and Black, Fire Retardant.
  - 2.8.2 Metallic Surfaces: TT-P-001932 Paint, Latex Base, Interior, White, Tints and Black, Fire Retardant.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Concrete and Concrete Masonry Units: Remove all glaze, efflorescence, laitance, dirt, grease, oil, asphalt, and surface deposits of iron and other foreign matter.
    - 3.1.2 Asbestos Cement: Remove stains with solvent. Do not wire-brush.
    - 3.1.3 Gypsum Wallboard: Remove dirt and dust prior to application of first coat.
    - 3.1.4 Plaster: Age at least 30 days. Clean, remove loose matter, and repair surface irregularities. Instrument-measured moisture content shall not exceed 8 percent.
    - 3.1.5 Wood: Remove foreign matter. On seasoned knots, scrape, clean, and apply thin coat of knot sealer. Scrape off or remove pitch with mineral spirits or turpentine. Set nails, and prime and fill nail holes and other surface imperfections with putty or plastic wood filler. Allow to dry and sand smooth.
    - 3.1.6 Ferrous Metals, Ungalvanized: If not shop-coated, clean with solvent. Remove loose rust, mill scale, and other foreign matter by proper wire brushing or sand blasting.
    - 3.1.7 Ferrous Metals, Galvanized: Clean with solvent.
  - 3.2 Application: Provide complete hiding and uniform thickness of coats.
    - 3.2.1 Concrete Masonry Units: Apply filler coat to bare concrete masonry unit surfaces where required and allow to dry. Follow with finish coats.
    - 3.2.2 Gypsum Wallboard and Plaster: Touch up suction spots or overall application of base coat or sealer to produce a uniform color or gloss prior to application of finish coats.
    - 3.2.3 Wood to Receive Stain: Sand lightly after application of stain. On open-grain wood surfaces, apply wood filler after staining as required. Sand smooth. Sand lightly between coats of varnish.
    - 3.2.4 Ferrous Metals: Prime bare metal prior to application of finish coats.

**Painting of Water Storage Tank Interior Surfaces**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for painting water storage tank interior surfaces. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: The following materials form a part of this section of the specification: Mil. Spec. DOD-P-15328, SSPC Paint 8, and Mil. Spec. MIL-P-15930.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Respirators: Respirators shall be worn by all persons engaged or assisting in spray painting. Air-fed respirators will be worn by all persons engaged in spray painting in confined areas (water thinned coatings excluded).
    - 3.1.2 Forced Ventilation: Whenever surface preparation or painting operations include the use of volatile organic solvents, the enclosed space shall be made safe at all times from fire and explosion as determined by a calibrated explosimeter or organic vapor analyzer. During the painting operation, sufficient exhaust ventilation shall be provided to exchange the air in the enclosed spaces with fresh air at the rate of 5,000 cfm for each spray gun in operation. All parts of the enclosed spaces shall be swept by moving air. Exhaust ducts shall discharge clear of working areas and away from sources of possible ignition. If the ventilation fails, operations shall be stopped and the compartment evacuated until sufficient exhaust ventilation is provided.
    - 3.1.3 Blast Cleaning: Ferrous surfaces shall be dry blast cleaned to near white metal grade, which shall be in compliance with SSPC-SP 5, except that paragraphs 3.1, 3.2, 3.3, and 3.10 shall not be applicable and except that a limited relaxation from the uniform white metal grade of surface cleanliness will be permitted, as follows. The metal shall be cleaned to such a degree that were a large surface to be divided into 6-inch squares, at least 75 percent of the subdivisions would meet

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the white metal grade of cleanliness and the remaining subdivisions would be randomly distributed. Within these small, randomly distributed areas a minor relaxation from white metal cleanliness would be permitted, consisting only of very slight shadows, stains, and discolorations stemming from very thin, adherent, sparsely scattered residues of mill scale and corrosion products. No relaxation from the white metal grade will be permitted on surface irregularities such as edges, interior angles, welds, rivet lines, and junctions of joining members. The overall blasting effort expended shall be not less than two-thirds (2/3) of that which would be required to accomplish the white metal grade of cleanliness on the specific surfaces involved, but this limitation shall not be construed as a waiver of any of the requirements above. Remove weld spatter not dislodged by blasting with impact or grinding tools. Surfaces shall be dry at the time of blasting.

- 3.1.4 Surface Protection: Within 8 hours after cleaning but in any event prior to the deposition or formation of any detectable moisture, contaminants, or corrosion, all ferrous surfaces that have been blast cleaned to the near-white metal grade shall be cleaned of dust and abrasive particles by brushing, vacuum cleaning, and/or blowdown with clean, dry compressed air, and shall be given the pretreatment and first coat of paint.
- 3.1.5 Pretreatment: All sandblasted surfaces shall receive a washcoat pretreatment complying with Mil. Spec. DOD-P-15328. Application shall be by spray, and all requirements of the specification concerning mixing, thinning, application, and spreading rate shall be followed. All materials not applied within a maximum of eight hours after mixing shall be discarded and must not be used.
- 3.2 Installation:
  - 3.2.1 Primer Paint: All pretreated surfaces shall receive two coats of vinyl paint complying with Mil. Spec. MIL-P-15930. Application shall be by brush or spray. All corners, angles, welds, rivets, and other surface irregularities shall receive one additional preliminary spray coat. The succeeding primer coat (or initial finish coat) shall not be applied until the primer is dry to touch. The color of alternate coats shall provide contrast to assist in obtaining complete coverage.
  - 3.2.2 Finish Paint: All primed surfaces shall receive a minimum of two coats of Aluminum Vinyl Finish Paint complying with SSPC Paint 8. The paint shall be formulated as specified except that high boiling solvents such as cyclohexanone shall not be used in the formulation. High boiling solvents may be substituted for the ketones specified in the thinner only if ambient temperatures at the time of application exceed 75 F (24 C). Application shall be by spray. All corners, angles, welds, rivets, and other surface irregularities shall receive one additional preliminary spray coat. The succeeding coat shall not be applied until the first coat is dry to touch.
  - 3.2.3 Thickness Requirements: Apply the washcoat pretreatment to a dry film thickness of at least 0.3 mils but not exceeding 0.5 mils. Apply the primer paint to produce a dry film of approximately 2.5 mils. Apply the finish paint such that the resulting total system has a minimum dry film thickness of at least 5 mils at its thinnest point. If this thickness is not obtained in the specified number of coats, apply additional coats of the finish paint to meet the minimum thickness requirement at no additional cost to the Member. Final thickness measurements shall be made by the Contractor in the presence of the Authorized Member Representative using a magnetic thickness gauge as specified in SSPC-PA 2.
  - 3.2.4 Final Drying Time: After the final coat of paint has been applied, the tank shall remain open and forced ventilation shall be continued for a minimum of three days prior to being flooded with water.
  - 3.2.5 Washing: After the final work has been completed in the tank, but prior to any disinfecting operations, wash the tank with clean water to remove all dust and overspray. Washing may take place during the final dry time provided the coating is sufficiently cured to withstand the abuse.
  - 3.2.6 Disinfection of Tank: After painting and all other interior work has been completed, disinfect the tank before it is replaced in service. If the local medical facility or health department requires a specific procedure for disinfection, follow that procedure. Otherwise the following procedure shall be followed: Place water containing 50 ppm chlorine in the tank to such a depth that when the tank is filled the resultant chlorine concentration shall be no less than 2 ppm. Hold the water containing 50 ppm chlorine in the tank for 24 hours before the tank is filled. Allow the full tank, in turn, to stand for 24 hours, after which the tank may be put into service without draining the water used to disinfect it.

Attachment 1: Specifications for the Work

**Painting of Water Storage Tank Exterior Surfaces**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for painting water storage tank exterior surfaces. Product shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: The following materials form a part of this section of the specification: Fed. Spec. TT-P-86, TT-P-320, TT-V-81, and SSPC Paint 101.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 All exterior surfaces to be painted shall be cleaned using power tools in compliance with SSPC-SP 3 or, at the option of the Contractor, surfaces may be blast cleaned in compliance with SSPC-SP 7. In addition, the following operations shall be implemented.
    - 3.1.2 Mildew shall be removed from all surfaces to be painted by scrubbing the surface with a solution consisting of 1/2 pound of trisodium phosphate and 1 pound of hypochlorite bleach per gallon of warm water. Additional bleach may be beneficial in heavily mildewed areas. Rinse surfaces to remove cleaning materials and allow to dry completely before repainting.
    - 3.1.3 Surface glaze remaining on existing coatings shall be removed either by lightly abrading the surface or through the use of a chemical deglosser.
    - 3.1.4 Removal of Vines and Trimming of Plantings: Remove all ivy vines and tentacles interfering with the contract work from the exteriors of the structure and haul from the site of the work. Remove ivy in such a fashion that the remaining growth shall all be live and connected to the root system. Other types of plantings that interfere with the contract surfaces shall be trimmed or tied back.
  - 3.2 Installation:
    - 3.2.1 All paints shall be mixed, thinned, and applied in compliance with the procedures and requirements set forth in SSPC-PA 1. The following paint system shall be used.
    - 3.2.2 Primer: The primer shall consist of one coat of a material complying with Fed. Spec. TT-P-86, Type II.
    - 3.2.3 Finish Coats: The finish coats shall consist of a minimum of two coats of one of the following paints: Paint 1 - job-mixed alkyd aluminum paint in compliance with SSPC Paint 101 Type I or Paint 2 - aluminum paint consisting of aluminum paste and a mixing varnish in compliance with Fed. Spec. TT-V-81, Type II and mixed in the proportions of two pounds of aluminum paste complying with Fed. Spec. TT-P-320 per gallon of mixing varnish.
    - 3.2.4 Thickness Requirements: Apply the primer paint to a dry film thickness of approximately 1.5 mils. Apply the finish paint such that the resulting total system has a minimum dry film thickness of at least 3.5 mils at its thinnest point. If this thickness is not obtained in the specified number of coats, apply additional coats of the finish paint to meet the minimum thickness requirement. Final thickness measurements shall be made by the Contractor in the presence of the Authorized Member Representative, using a magnetic thickness gauge as specified in SSPC-PA 2.
    - 3.2.5 Respirators: Respirators shall be worn by all persons engaged or assisting in spray painting. Air-fed respirators will be worn by all persons engaged in spray painting in confined areas (water thinned coatings excluded).
    - 3.2.6 Lettering and Sign Painting: Building number signs, gauges, and other signs that are painted shall have lettering and numbering repainted. Design and color shall match existing.

**Wall Coverings**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of vinyl, cork, fabric, and flexible wood wall coverings. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Vinyl Wall Covering: Wall covering shall conform to Fed. Spec. CCC-W-408, Type I, II, or III as required. A polyvinyl fluoride film, 1/2 mil thick, shall be factory-applied to the wall covering as

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- required. The film shall conform to Fed. Spec. L-P-1040, Type I, Grade B, Class 2.
- 2.2 Cork wall covering shall be either sheet cork in standard 24-inch by 36-inch sheet size, or sheeting composed of a cork sheeting material factory-bonded to a fabric backing. Wall covering material shall be either 20 ounces per lineal yard or 24 ounces per lineal yard and 36 inches wide, as required.
  - 2.3 Fabric wall covering shall be natural woven fabric bonded to a paper backing. Fabric materials shall be treated for stain and mildew resistance and shall be a minimum of 27 inches wide. All fabric wall coverings shall be Class A flame-rated and tested in accordance with ASTM E 84.
  - 2.4 Flexible wood sheets shall be composed of genuine wood veneer bonded to a clay-filled cotton backing fabric to form a flexible wall covering in sheets not less than 12 inches wide, factory matched and numbered in sequence for spaces as required.
  - 2.5 Primer and adhesive shall be mildew-resistant and non-staining, as recommended by the wall covering manufacturer.
  - 2.6 Wainscot caps shall be aluminum extrusions.
  - 2.7 Fire Hazard Classification: Provide wall covering materials bearing UL label and marking, indicating fire hazard classification of wall covering, as determined by ASTM E 84. Provide materials with the following fire hazard classifications: Flame spread not more than 25. Smoke developed not more than 50.
  - 3.0 EXECUTION:
  - 3.1 Wall covering materials shall be acclimatized by removing from packaging in area of installation not less than 24 hours before application.
  - 3.2 Prime and seal substrates in accordance with wall covering manufacturer's recommendations for type of substrate. Surface sealer shall be applied to gypsum wallboard to permit future removal of wall covering without damage to paper facing.

**DIVISION 10-SPECIALTIES**

**Compartments and Cubicles for Shower and Toilet Rooms**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of laminated plastic and metal toilet partitions, urinal screens, and shower and dressing compartments. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Laminated Plastic Toilet Partitions and Urinal Screens:
    - 2.1.1 Plastic laminate shall be NEMA LD-3, minimum 0.062 inch thick.
    - 2.1.2 Core material for plastic laminate shall be manufacturer's standard particleboard or plywood, in thickness to provide a nominal dimension of 1 inch for doors, panels, and screens and 1-1/4 inches for pilasters.
    - 2.1.3 Pilaster shoes shall be ASTM A 167, Type 302 or 304, stainless steel not less than 3 inches high, 20 gauge, finished to match hardware.
    - 2.1.4 Stirrup brackets shall be manufacturer's standard design for attaching panels to walls and pilasters, either chromium-plated nonferrous cast alloy or anodized aluminum.
    - 2.1.5 Hardware and accessories shall be manufacturer's standard design heavy duty operating hardware and accessories of chromium-plated nonferrous cast alloy or chromium plated brass, as required.
    - 2.1.6 Overhead bracing shall be continuous extruded aluminum tubing in antigrip profile, with clear anodized finish.
    - 2.1.7 Anchorages and fasteners shall be manufacturer's standard exposed fasteners of stainless steel, chromium-plated steel, or brass finished to match hardware, with theft-resistant type heads and nuts. For concealed anchors, use hot-dip galvanized, cadmium-plated, or other rust-resistant protective-coated steel.
    - 2.1.8 Fabrication:
      - 2.1.8.1 General: Furnish standard doors, panels, screens, and pilasters fabricated for partition system. Furnish units with cutouts, 10155-drilled holes, and internal reinforcement to receive partition-

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- mounted hardware, accessories, and grab bars.
- 2.1.8.2 One-piece face sheets shall be pressure-laminated to core material with no splices or joints, and with edges straight and sealed. Seal exposed core material at cutouts to protect against moisture.
  - 2.1.8.3 Overhead-Braced Partitions: Furnish galvanized steel supports and leveling bolts at pilasters, as recommended by manufacturer to suit floor conditions. Make provisions for setting and securing continuous aluminum overhead-bracing tube at top of each pilaster. Furnish shoe at each pilaster to conceal supports and leveling mechanism.
  - 2.1.8.4 Floor-Supported Partitions: Furnish galvanized steel anchorage devices, complete with threaded rods, lock washers, and leveling adjustment nuts at pilasters, to permit structural connection at floor. Furnish shoe at each pilaster to conceal anchorage.
  - 2.1.8.5 Ceiling-Hung Partitions: Furnish galvanized steel anchorage devices, complete with threaded rods, lock washers, and leveling adjustment nuts at pilasters, to permit connection to structural support above finished ceiling. Furnish devices that are designed to support pilasters from structure without transmitting load to ceiling finish. Furnish 3 inch high stainless steel trim piece, finished to match hardware, at each pilaster.
  - 2.1.8.6 Wall-Hung Screens: Furnish panel units of same construction and finish as partition system panels.
  - 2.1.8.7 Floor-Supported Screens: Furnish pilasters not less than 1 inch in thickness, panels and pilasters of same construction and finish as toilet partitions. Furnish galvanized steel anchorage devices, complete with threaded rods, lock washers, and leveling adjusting nuts at pilasters, to permit structural connection to floor. Furnish shoe at pilaster to conceal anchorage.
  - 2.1.8.8 Furnish hardware for each compartment in partition system, as follows:
    - a. Cutout inset type hinges, adjustable to hold door open at any angle up to 90 degrees; gravity type, spring-action cam type, or concealed torsion rod type.
    - b. Recessed or surface-mounted latch unit, designed for emergency access, with combination rubber-faced door strike and keeper.
    - c. Coat hook with combination hood and rubber-tipped bumper.
    - d. Door pull.
  - 2.2 Metal Toilet Partitions and Urinal Screens:
    - 2.2.1 Toilet enclosures shall conform to Fed. Spec. RR-P-1352, Type I, Style A, B, or C as required. Finish surface of panels shall be baked enamel, in color as required. Panels to receive toilet paper holders or grab bars shall be reinforced for the reception of the items required.
    - 2.2.2 Room entrance screens shall conform to Fed. Spec. RR-P-1352, Type II, Style A . Finish surface of screens shall be baked enamel.
    - 2.2.3 Urinal screens shall conform to Fed. Spec. RR-P-1352, Type III, Style A or D, as required. Finish surface of screens shall be baked enamel. Width of Style A screens shall be 24 inches or 36 inches, as required.
  - 2.3 Shower and Dressing Compartments:
    - 2.3.1 General: Materials shall be provided which have been selected for surface flatness and smoothness. Exposed surfaces, which exhibit pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections on finished units are not acceptable. Shower compartments shall include a shower receptor for each compartment. 2.3.2 Steel Sheets for Baked Enamel Finish shall be ASTM A 591, Class C, galvanized-bonderized, of the following minimum thicknesses:
      - a. Pilasters (overhead-braced): 20-gauge.
      - b. Panels and Screens: 20-gauge.
      - c. Doors: 22-gauge.
    - 2.3.3 Concealed anchorage reinforcement shall be minimum 12-gauge galvanized steel sheet.
    - 2.3.4 Concealed tapping reinforcement shall be minimum 14-gauge galvanized steel sheet.
    - 2.3.5 Core material for metal partitions shall be manufacturer's standard sound-deadening honeycomb of impregnated Kraft paper, in thickness to provide finished dimension of 1 inch minimum for doors, panels, and screens and 1-1/4 inches minimum for pilasters.
    - 2.3.6 Pilaster shoes shall be ASTM A 167, Type 302/304 stainless steel, not less than 3 inches high, 20-gauge, finished to match hardware.

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- 2.3.7 Stirrup brackets shall be manufacturer's standard design for attaching panels to walls and pilasters, either chromium-plated nonferrous cast alloy or anodized aluminum.
- 2.3.8 Hardware and Accessories shall be manufacturer's standard design, heavy-duty operating hardware and accessories of chromium-plated nonferrous cast alloy or chromium-plated brass, as required.
- 2.3.9 Overhead bracing shall be continuous extruded aluminum tubing in antigrip profile, with clean anodized finish.
- 2.3.10 Anchorages and fasteners shall be manufacturer's standard exposed fasteners of stainless steel, chromium-plated steel, or brass finished to match hardware, with theft-resistant type heads and nuts. For concealed anchors, use hot-dip galvanized, cadmium-plated, or other rust-resistant protective-coated steel.
- 2.4 Solid Plastic(polymer resin) Toilet / Shower Enclosures and Urinal Screens:
  - 2.4.1 Toilet and shower enclosures shall conform to FS RR-P-1352, Type I, style A. Doors, panels, pilasters, and screens shall be solid Polymer resin. All doors, panels, pilasters and screens shall be protected with a plastic masking.
  - 2.4.2 Doors, panels, pilasters, and screens shall be one (1) inch thick with all edges uniformly machined to a 0.250 inch radius. Panels shall be anchored to walls and pilasters with continuous wall brackets made of extruded aluminum. Each panel shall contain a continuous aluminum strip on the bottom. Doors, Panels, pilasters and urinal screens shall be provided with the standard hardware. Doors shall be furnished with one (1) coat hook / bumper of manufacturer's standard.
- 2.5 Fabrication:
  - 2.5.1 Furnish standard doors, panels, screens, and pilasters fabricated for partition system, unless otherwise indicated. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as required.
  - 2.5.2 Door Dimensions: Unless otherwise indicated, furnish 24-inch wide in-swinging doors.
  - 2.5.3 Pressure laminate seamless face sheets to core material and seal edges with continuous interlocking strip or with lapped and formed edges. Weld edges and corners, with exposed welds ground smooth.
  - 2.5.4 Overhead-Braced Partitions: Furnish galvanized steel supports and leveling bolts at pilasters, as recommended by manufacturer to suit floor conditions. Make provisions for setting and securing continuous aluminum overhead-bracing tube at top of each pilaster. Furnish shoe at each pilaster to conceal supports and leveling mechanism.
  - 2.5.5 Floor-Supported Partitions: Furnish galvanized steel anchorage devices, complete with threaded rods, lock washers, and leveling adjustment nuts at pilasters, to permit structural connection at floor. Furnish shoe at each pilaster to conceal anchorage.
  - 2.5.6 Furnish hardware for each dressing compartment as follows:
    - a. Cutout inset type hinges, adjustable to hold door open at any angle up to 90 degrees; gravity type, spring-action cam type, or concealed torsion rod type.
    - b. Recessed or surface-mounted latch unit, designed for emergency access, with combination rubber-faced door strike and keeper.
    - c. Coat hook, with combination hook and rubber-topped bumper.
    - d. Door pull.
  - 2.5.7 Accessories: Each dressing compartment shall be provided with the following accessories: shower curtain rod, curtain, hooks, soap dish, and wood seat.
  - 2.5.8 Finish for compartments and showers shall be baked enamel. Clean galvanized steel surfaces after fabrication and before application of enamel coating system to remove processing compounds, oils, and other contaminants. Prime metal with baked-on rust-inhibitive primer. Apply two coats of thermosetting enamel finish, applied by electrostatic process, and baked in accordance with paint manufacturer's instructions.
  - 2.5.9 Shower receptor shall be pre-cast terrazzo, made of marble chips cast in white Portland cement. Provide wrought brass drain bodies cast integrally in receptor. Drain bodies shall provide for caulked lead connection not less than one inch deep to a two-inch pipe, with a removable type stainless steel strainer. Shower receptor curb shall be rabbeted 1 inch deep to receive steel shower walls. Receptors shall have an integral steel flange, 6-inch minimum height, on all sides except at threshold location.

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3.0 EXECUTION:

- 3.1 Installation: Partitions associated with compartments and cubicles shall be installed straight and plumb with all horizontal lines level and rigidly anchored to the supporting construction. Anchorage to walls shall be by through-bolting or toggle-bolting as required. Drilling and cutting for installation of anchors shall be at locations that will be concealed in the finished work.

**Access and Pedestal Floors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of access and pedestal floors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Provide access flooring that, when installed, complies with NFPA 75, (components shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less when tested in accordance with NFPA 255 and ASTM E 84) unless otherwise directed.
- 2.1 Panels shall be 24 inches by 24 inches square (+/- 0.015 inch) and shall be capable of withstanding a concentrated load of 1,200 pounds with a deflection of not greater than 0.080 inches and a uniform load of 500 pounds per square foot with a deflection not to exceed 0.080 inches.
- 2.2 Pedestals shall be assemblies that are electrically conductive and corrosion-resistant. Each shall be capable of adjustments of 1/64-inch increments, have positive locking, and be capable of supporting a 5,000-pound axial load.
- 2.3 Stringers (on floors 18 inches in height or greater) shall be capable of individual removal and shall support 200 pounds.
- 2.4 Accessory ramps, handrails, and fascia plates shall be compatible with panels and pedestals.

3.0 EXECUTION:

- 3.1 Preparation: No installation of access flooring shall take place until structural floor surfaces are clean and dry.
- 3.2 Installation:
- 3.2.1 Completed system shall be rigid and free from vibration, with no rocking panels.
- 3.2.2 Floor shall be level within +/- 0.062 inch in any 10-foot area and +/-0.125 inch over the entire area.

**Pest Control**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for pest control. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: One of the following materials shall be used for pest control:
- 2.1 Benzene Hexachloride, 0.8 percent gamma isomer concentration in a water emulsion.
- 2.2 Chlordane, 1.0 percent concentration in a water emulsion.
- 2.3 Heptachlor, 0.5 percent concentration in a water emulsion.
- 3.0 EXECUTION:
- 3.1 Immediately prior to placing concrete floor slabs on grade and basement slabs for structures and immediately prior to backfilling around foundation for structures with basements or crawl spaces, soil treatment shall be applied as hereinafter specified. Soil treatment agents shall be delivered to the jobsite in sealed and labeled containers. Labels shall bear the manufacturer's warnings to be observed in the handling and use of soil treatment materials.
- 3.2 Soil treatment shall be applied in accordance with the precautions on the label and in the following minimum quantities:
- 3.2.1 Under slabs on grade, 1-1/2 gallons per 10 square feet as overall treatment. In critical areas such as around utility openings for pipes, ducts, and conduits, 0.5 gallon per square foot shall be applied. Along the exterior perimeter of the slab and under expansion joints, 2 gallons per 5 linear feet in a strip 1 foot wide shall be applied.

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- 3.2.2 Foundation walls of structures with basements, 2 gallons per 5 linear feet per foot of depth from finished grade to top of footings in a strip 1 foot wide on exterior side at each elevation as follows: near level of top of footings before any backfill is placed, as each 1-foot lift of backfill is completed, and just below finished grade. Two gallons per 5 linear feet in a strip 1 foot wide shall be applied under the basement slab next to perimeter footings.
- 3.2.3 Foundation walls of structures with crawl spaces, 2 gallons per 5 linear feet per foot of depth from finished grade to top of footings in a strip 1 foot wide on exterior, with one-half of the application near level of top of footings before any backfill is placed, and the remainder just below finished grade. Two gallons per 5 linear feet in a strip 1 foot wide shall be applied adjacent to the interior side of the foundation of buildings.

**Flagpoles**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of flagpoles. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Steel flagpoles shall be constructed from standard weight steel pipe complying with ASTM A 53, Type S, Grade B, or better.
  - 2.2 Aluminum flagpoles shall be fabricated from seamless extruded tubing complying with ASTM B 241, alloy 6063-T6, having a minimum wall thickness of 3/16 inch.
  - 2.3 Stainless steel flagpoles shall be seamless construction, fabricated of AISI 302/304 alloy.
  - 2.4 Bronze Flagpoles shall be fabricated from Copper Development Assoc. No. 230 bronze alloy seamless pipe.
  - 2.5 Flagpole style shall be cone-tapered, sectionally swaged, or entasis-tapered and shall be of designated height and diameter.
  - 2.6 Two continuous halyards shall be provided for each pole and furnished complete with all standard fittings.
  - 2.7 Provide anchors and base necessary for the particular installation requirements.
- 3.0 EXECUTION
  - 3.1 Flagpoles shall have a positive lightning ground for each installation.
  - 3.2 Portions of ground-set flagpoles shall be painted below ground with a heavy coat of bituminous paint.

**Directory and Bulletin Boards**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of directories and bulletin boards. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Directory boards shall be grooved and covered with felt, vinyl, or rubber. Boards shall be fabricated of one piece of material. Space grooves at 1/4 inch O.C. to receive changeable letters or changeable name bases, as required.
  - 2.2 Chalkboard surfaces shall comply with Porcelain Enamel Institute specifications.
  - 2.3 Tack Board Surfaces shall be natural cork, plastic-impregnated cork, or vinyl fabric laminated under pressure to 1/4 inch thick exterior plywood or hardwood backing.
  - 2.4 Visual aid boards shall have a white porcelain enamel writing surface.
  - 2.5 Frames shall be constructed of hardwood, chrome-plated steel, aluminum, bronze, or stainless steel of designated design. All units located on the exterior shall be of weatherproof construction.
  - 2.6 Glass for encased boards shall be laminated glass, tempered glass, acrylic sheeting, or polycarbonate sheeting.
  - 2.7 Locks and keys for glass-encased boards shall be of the disk tumbler type with two keys.
- 3.0 EXECUTION:

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- 3.1 Mounting surface preparation, and product installation shall be in accordance with the product manufacturer's written recommendations.
- 3.2 The work shall be protected against damaged during construction. During construction hardware shall be adjusted for proper operation. Products that are damaged or improperly installed shall be removed and reinstall or replaced with new products as directed. Glass, frames and other discolored surfaces shall be cleaned in accordance with manufacturer's instructions.

**Signs**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of signs. Materials shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Cast-aluminum letters shall have a satin, polished, clear anodized, colored anodic, or enameled finish.
  - 2.2 Cast-bronze letters shall have a satin, polished, or oxidized finish.
  - 2.3 Special medallion construction shall be of cast bronze or aluminum, free from pits, scale, second holes, or other defects.
  - 2.4 Adhesive door signs shall be fabricated from individually die cut-to-shape letters that are pre-spaced and pre-masked on a high-quality plastic film coated with a pressure-sensitive adhesive backing.
  - 2.5 Hard plastic door signs shall be made from high-pressure plastic laminate engraving stock with face and core plies in contrasting colors.
  - 2.6 Frames for plastic door signs shall be made of solid extruded aluminum with an anodized gold or silver finish and concealed mounting holes. Frames shall be designed to allow signs to slide in from the side.
- 3.0 EXECUTION
  - 3.1 Signs shall be installed in accordance with approved manufacturer's instructions. Signs shall be installed plumb and true at mounting heights. Locations and mounting heights shall be as directed by the Authorized Member Representative. Signs mounted on other surfaces shall not be installed until the finishes on such surfaces have been completed.
  - 3.1 Anchorage shall be in accordance with approved manufacturer's instructions. Anchorage not otherwise specified or indicated shall include slotted inserts, expansion shields, and power-driven fasteners when approved for concrete; toggle bolts and through bolts for masonry; machine carriage bolts for steel; lag bolts and screws for wood.
  - 3.2 The work shall be protected against damage during construction. Hardware shall be adjusted for proper operation. Glass, frames and other sign surfaces shall be cleaned in accordance with manufacturer's instructions.

**Metal Lockers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of metal lockers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Materials and Finishes:
    - 2.1.1 Stainless Steel: ASTM A 167, Type 302, 304, or 316 alloy. Exposed surfaces shall have a satin finish or a minimum of no. 4 polished finish.
    - 2.1.2 Carbon Steel: ASTM A 366, baked enamel finish.
  - 2.2 Wardrobe Lockers:
    - 2.2.1 Backs and sides of lockers shall be fabricated of minimum 24-gauge steel with double flanged connections extending full height. Top and bottom shall be of not less than 24 gauge steel with flanged edges. Exposed ends of non-recessed lockers shall be of a minimum 16-gauge steel. Provide one 24-gauge steel hat shelf in single tier units.

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- 2.2.2 Doors shall be one-piece construction of minimum 16-gauge sheet steel, flanged at all edges. Provide extra bracing or reinforcing on inside of doors over 15 inches wide.
- 2.2.3 Ventilation: Provide stamped, louvered vents in door face. Single tier lockers shall have not less than 6 louver openings top and bottom. Double-tier lockers shall have not less than 3 louver openings top and bottom. Multi-tier lockers shall have not less than 2 louver openings top and bottom, or 3 louver openings top or bottom.
- 2.2.4 Hinges shall be heavy-duty, not less than 0.050 inch thick steel, full-loop, 5-knuckle, tight pin, 2 inches high. Weld to inside of frame and secure to door with not less than 2 factory-installed fasteners, which are completely concealed and tamperproof when door is closed. Provide at least 3 hinges for each door 42 inches high and over, at least 2 hinges for each door less than 42 inches high.
- 2.2.5 Standard hardware items, including coat hooks, sequential number plates, and arrangements for locking devices, shall be provided.
- 2.3 Box Lockers:
  - 2.3.1 Tops and bottoms of lockers shall be fabricated from minimum 16-gauge steel sheet and backs from not less than 18-gauge steel. Sides and intermediate partitions shall be constructed of expanded metal welded to steel hemming. Provide 16-gauge steel shelf in single tier lockers.
  - 2.3.2 Doors shall be manufacturer's standard of either expanded metal in a steel frame or perforated steel sheet with flanged edges, minimum 16 gauge. Provide extra bracing or reinforcing on inside of doors over 15 inches wide.
  - 2.3.3 Hinges shall be heavy-duty, not less than 0.050 inch thick steel, full-loop, 5-knuckle, tight pin, 2 inches high. Weld to inside of frame and secure to door with not less than 2 factory-installed fasteners that are completely concealed and tamperproof when door is closed. Provide at least 3 hinges for each door 42 inches and over, at least 2 hinges for each door less than 42 inches high, or continuous piano hinge at top for multi-tier units. Manufacturer shall provide all necessary hardware including sequential number plates and arrangements for locking devices.
- 2.4 Basket Locker: Rack shall have legs for fastening to the floor and sway braces. Racks shall be designed to allow bolting together to form double-faced racks.
  - 2.4.1 Uprights on Rack shall be a minimum of 13 gauge, shelves a minimum of 18 gauge, and dividers a minimum of 20 gauge, ribbed for stiffness.
  - 2.4.2 Baskets shall be all wire or wire and minimum 24 gauge steel front with perforations. All baskets shall be zinc plated with a bright finish. Pilfer guards shall be available for all styles of baskets.
  - 2.4.3 Hardware shall be provided as required for installation and functioning including sequential number plates and arrangements for locking.
- 3.0 EXECUTION: Lockers shall be installed in accordance with the designated arrangement, securely anchored in position, and accurately aligned vertically and horizontally.

**Fire Extinguishers, Cabinets and Accessories**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of fire extinguishers, cabinets, and accessories. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Fire extinguishers shall be Underwriters' Laboratories (UL) listed and/or Factory Mutual System (FM) approved for their intended use in compliance with NFPA 10 and its appendices. Fire extinguishers shall be clearly marked to indicate extinguisher suitability according to class of fire.
  - 2.2 Fire extinguisher cabinets and accessories shall be in compliance with NFPA 10 and its appendices and shall be of sufficient size to house fire extinguishers of the type and capacity required.
- 3.0 EXECUTION:
  - 3.1 Fire extinguishers shall be distributed and maintained in compliance with NFPA 10 and its appendices.
  - 3.2 Fire extinguisher cabinets and accessories shall have the locations of fire extinguishers readily recognizable by the use of markings that are not part of the extinguisher itself.

**Postal Specialties**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of mail chutes and mail boxes. Materials shall match existing materials and/or as shall be directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 General: All products shall comply with U.S. Postal Service requirements for construction and installation of units serviced by USPS carriers.
  - 2.2 Mail chutes shall have sides and back that are of a continuous one-piece construction extending from floor to ceiling on each floor and extending 4 feet 6 inches above finish flooring on top floor. Back and sides shall be fabricated of aluminum with a 0.105-inch minimum thickness and alloy 6063-T5 extrusions with satin anodized finish complying with NAAMM-M31C21A31. Removable front panels shall be made of 3/16-inch tempered glass, 1/4-inch float glass, or transparent polycarbonate resin plate, set into continuous one-piece frames and covers. Frames and covers shall be fabricated from aluminum with a 0.125 inch minimum thickness, and alloy 6063-T5 extrusions with satin anodized finish complying with NAAMM-M31C21A31, or color anodized, bronze, or standard bronze statuary finish.
    - 2.2.1 Furnish manufacturer's standard cast-metal floor and ceiling fascia and lock band finished to match front frames and covers. Furnish lock band with acceptable locking device and keyed lock that prevents key removal if locking device is not secured.
    - 2.2.2 Mail slot shall be metal pocket with cigarette ejector and brass finish. Inscribe "U.S. MAIL" on face of mail slot.
    - 2.2.3 Bundled mail or package chute shall be constructed similarly to standard mail chutes. Furnish complete with removable frames, hinged lock band, bottom deflector or baffle slow-down, and mail openings on each floor. Fabricate chute size 14 inches wide and 7 inches deep, unless otherwise indicated. Bundled mail chutes will not require USPS approval.
    - 2.2.4 Locked receiving mail box shall be constructed of aluminum alloy 6063-T5 with satin anodized finish complying with NAAMM-M31C21A31 or bronze with statuary finish. Boxes shall be 36 inches by 20 inches by 12 inches.
  - 2.3 Mail Boxes:
    - 2.3.1 Letter slot shall be metal, designed for flush mounting. The legend "U.S. MAIL" must be plainly inscribed on every mail opening.
    - 2.3.2 Rural letter box shall be post-mounted type and shall have a heavy-duty piano hinge and red flag. Doors shall have legend "U.S. MAIL" plainly inscribed. Boxes shall have a polyurethane baked-on finish that resists rust.
    - 2.3.3 Apartment House Keyed Mail Boxes: Mail compartments and wall receptacles shall be of heavy galvanized steel or corrosion-resistant metal construction. Each compartment shall be designed to receive name card and shall bear identification numbers as directed.
    - 2.3.4 Letter Box with Combination Lock: Each compartment shall be equipped with a single dial, 3-digit combination lock and shall be provided with identification numbers.
    - 2.3.5 Letter Box with Keyed Lock: Each compartment shall be equipped with a 5-pin tumbler cylinder lock capable of at least 1,000 key changes, with 2 keys for each box door. Each box shall be keyed differently and a master key shall be provided. Provide identification numbers for each compartment.
- 3.0 EXECUTION: Install postal specialties so that they comply with U.S. Postal Service requirements.

**Wire Mesh Partitions**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of wire mesh partitions. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

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2.0 PRODUCTS:

- 2.1 Mesh shall be 10-gauge crimped steel wire woven into 1- 1/2 inch mesh, or heavy-duty type constructed of 6-gauge or 8-gauge steel woven wire woven into 2-inch mesh, securely clinched to frame members.
  - 2.2 Frames: Provide cutouts for pipes, ducts, beams, and other items necessary for partition installation.
    - 2.2.1 Vertical Members shall be 1-1/4 inch x 5/8-inch cold-rolled steel C-Section channels with 1/4-inch bolt holes approximately 15 inches on center.
    - 2.2.2 Horizontal members shall be 1-inch x 1/2-inch x 1/8-inch cold-rolled steel channels, mortised and tenoned to vertical members.
    - 2.2.3 Horizontal reinforcing members shall be 1-inch x 1/2-inch x 1/8-inch cold-rolled steel channel with wire woven through or two 1-inch x 3/8-inch channels bolted or riveted to each side of mesh and secured to vertical members. Provide number of horizontal reinforcing members to suit panel height.
  - 2.3 Stiffening Bar: For free-standing partitions over 8 feet -0 inches in height, provide flat bar stiffener posts between abutting panel frames.
  - 2.4 Top capping bars shall be 2-1/4 inch x 1-inch cold-rolled steel channels, secured to top framing channel with 1/4-inch U-bolts spaced not more than 28 inches on center.
  - 2.5 Corner posts shall be 1-1/4 inch x 1-1/4 inch x 1/8-inch angles with 1/4-inch bolt holes to align with bolt holes in vertical frame members and floor plate.
  - 2.6 Floor shoes shall be cast iron, sized to suit vertical framing and to provide approximately 3 inches clear space between finished floor and bottom horizontal frame members. Furnish units with set screw for leveling adjustment.
  - 2.7 Sheet metal base shall be panels formed to 16-gauge steel sheet, welded or bolted to frames.
  - 2.8 Hinged Door: Door frame shall be of 1-1/4 inch x 1/2-inch x 1/8-inch channels, with 1-1/4 inch x 1/8-inch flat bar cover plate on 3 sides and matching 1/8-inch thick angle strike bar and cover on lock side. Provide 1-1/2 pair butt hinges riveted or welded to door and frame and bronze mortise type cylinder lock operated by key outside with recessed knob inside. Provide cylinders for lock, keyed and master keyed, if required.
  - 2.9 Sliding Door: Door frame shall be of 1-1/2 inch x 3/4-inch x 1/8-inch channels with 1-1/2 inch x 1/8-inch flat bar cover plate on all 4 sides. Provide door with two 4-wheel roller bearing carriers, box track, bottom guide channel, and bronze mortise type cylinder lock operated by key outside and recessed knob inside. Provide cylinders for locks, keyed and master keyed, if required.
  - 2.10 Service Window: Fabricate of same mesh and frames as panel units, arranged to lock in open and closed positions with spring catches.
  - 2.11 Service Window Shelf: Fabricate of 12-gauge steel, flanged front and back, edges finished smooth, with side brackets for support.
  - 2.12 Line Posts: Where partition runs exceed 20 feet without intersection or connection to overhead framing, furnish standard line posts and base plates located at intervals to ensure partition rigidity and stability.
  - 2.13 Finish: Manufacturer's standard shop-applied enamel finish.
  - 2.14 Provide bolts, hardware, and accessories for complete installation.
- 3.0 EXECUTION:
- 3.1 Erect partitions plumb, rigid, properly aligned, and securely anchored in place.
  - 3.2 Provide additional field bracing as necessary for rigid, secure installation.

**Demountable Partitions**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of demountable partitions. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 General Requirements: Movable partitions shall be floor-to-ceiling type, designed for erection on

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- finished floors, and shall include doors, windows, fasteners, and accessories required for the installation. The partition system shall be capable of accommodating electrical wiring, outlets, and switches and shall be readily demountable without damage to panels, framing, electrical work, and other major components.
- 2.2 Fire-resistive rating and test: partitions shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less when tested in accordance with ASTM E 84. Fire-resistance rating shall be determined in accordance with ASTM E 119.
  - 2.3 Sound Transmission Class and Test: Where sound-rated partitions are required, partition assemblies shall have a minimum STC of 40. STC range shall be determined in accordance with Sound Transmission Test by Two-Room Method and reported in accordance with the appendix to ASTM E 90 for 11 frequency data or ASTM E 413 for 16 frequency data.
  - 2.4 Panel units shall be manufacturer's standard construction except that gypsum wallboard shall be a minimum of 5/8 inch thick and shall conform to ASTM C 36. Gypsum backing board, if used, shall conform to ASTM C 442.
  - 2.5 Framing System: The framing system shall consist of extruded anodized aluminum or roll-formed steel components that include ceiling runners, floor track, starting units, studs or posts, post covers if applicable, bracing, and suitable treated fasteners to prevent corrosion. The framing system when assembled with panel units shall form a rigid, stable partition.
  - 2.6 Doors, Frames, and Hardware: Doors shall be 1-3/4 inch flush hollow metal of a size to provide 3/32-inch clearance at jambs and head. Door frames shall provide a compatible appearance with other trim components, shall be a minimum 18-gauge cold-rolled steel or extruded anodized aluminum constructed to incorporate a cushion door stop at the head and both jambs, and shall allow for variations in floor level. Door hardware shall be the manufacturer's standard type hardware, except all doors shall receive 1-1/2 pairs of 4-1/2 inch by 4-1/2 inch butts.
  - 2.7 Finishes: Exposed steel or aluminum surfaces shall be prefinished. Gypsum wallboard shall be painted or finished with a minimum 6-mil vinyl wall covering, as required.
  - 2.8 Base trim shall be 4-inch PVC without exposed fasteners, 4-inch vinyl cover base with snap-on capabilities, 4-inch vinyl cover base applied with adhesive, or 4-inch metal clip on base cover, as required.
  - 3.0 EXECUTION: Partitions shall be erected plumb and straight after floor covering and finished ceiling are in place. Doors shall be hung to swing freely and hardware shall be carefully fitted and adjusted. Glass for glazed openings shall be installed on shims in a vinyl or polyurethane foam gasket. Glass stops shall be installed without exposed fastenings.

**Security Screens**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of security screens for doors and windows. Products shall match existing materials and shall be as directed by the Authorized Member Representative. Installations shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Mesh shall be 9-gauge crimped steel wire woven into 2-inch mesh securely clinched to frame members.
  - 2.2 Standard diamond pattern expanded metal shall be 1-1/2 inch, 9-gauge, carbon steel conforming to ASTM F 1267 Type I Class 1.
  - 2.3 Flattened diamond pattern expanded metal shall be 1-1/2 9-gauge carbon steel conforming to ASTM F 1267 Type II Class 1.
  - 2.4 Frame bars and center stiffeners shall be not less than 1/2-inch in diameter cold finished steel bars conforming to ASTM A 108.
  - 2.5 Frame channels shall be hot rolled low carbon bar channels not less than 1-inch by 1/2-inch by 1/8-inch conforming to ASTM A 29.
  - 2.6 Center stiffeners where frame channels are used, shall be not less than two 3/4-inch by 3/8-inch channels, conforming to ASTM A 29, bolted to each side.
  - 2.7 Subframes for hinged security screens shall be not less than 1-1/4 inch by 1-1/4 inch by 1/8-inch

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medium carbon steel angles conforming to ASTM A 36.

- 2.8 Finish: Manufacturer's standard shop-applied enamel finish or hot dipped galvanized as directed.
- 2.9 Provide bolts, masonry anchors, hardware, and accessories for complete installation. Hardware shall include all padlock hasps and staples, hinges, and locking devices. Provide cylinders for locks, keyed and mastered keyed, if required.
- 3.0 EXECUTION:
- 3.1 Erect security screens plumb, rigid, properly aligned, and securely anchored in place for a rigid installation.

**Movable Metal Partitions**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of movable metal partitions. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Freestanding partition systems shall consist of individual panels, connector posts, and framing components. Nominal panel height shall be 5 feet-0 inches.
- 2.2 Panels shall be of manufacturer's standard width and height, constructed of 1/8-inch S2S tempered hardboard facing laminated to a core material. Total thickness shall be 1-9/16 inches.
- 2.3 Panel face coverings shall be vinyl, plastic laminate, fabric, natural hardwood, or baked enamel on steel substrate.
- 2.4 Panels shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less when tested in accordance with ASTM E 84 when tested as a composite unit.
- 2.5 Framing members shall be extruded aluminum shapes in 6063-T5 Alloy and 22-gauge pre-finished steel.
- 2.6 Exposed components shall have anodized or baked acrylic paint finish.
- 2.7 Panel frame design shall provide connection and attachment of connector posts and various framing components with the use of simple hand tools. Each panel unit shall be able to be individually free-standing or connected to other panels.
- 2.8 Sound-absorbing panels shall be constructed of flame-resistant decorator fabric applied over a reinforced wood frame and fiberglass core. Flame-resistant fiberglass insulation shall be held in place by galvanized steel wire netting. Total panel thickness shall be 2-1/2 inches providing a minimum noise reduction coefficient (NRC) of 0.75.
- 3.0 EXECUTION: Additional framing components shall be provided as required to assemble the freestanding partitions. Components include, but are not limited to, vinyl edge inserts and filler caps, individual panel supports, and wall connectors.

**Metal Storage Shelving**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of metal storage shelves. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Metal Storage Shelving: Fed. Spec. AA-S-1048, Carbon Steel, baked enamel finish or ASTM A 167, stainless steel, a minimum no. 3 polished finish or a satin finish.
  - 2.1.1 Shelves: Form of 0.0478-inch thick steel with front and rear faces double flanged and box channeled.
  - 2.1.2 Brackets: Cantilever design, steel not less than 0.1046 inch thick and of hook-in-lift-off design, adjustable without use of tools.
  - 2.1.3 Anchorage: 1/4-inch size bolts with standard nuts and lock washers.
- 3.0 EXECUTION: Storage shelving shall be installed in accordance with the designated arrangement, securely anchored in position, and accurately aligned vertically and horizontally.

**Toilet Accessories**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of toilet accessories other than porcelain type tile wall accessories. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Finishes: Finishes on metal shall be provided as follows:
    - 2.1.1 On Stainless Steel: No. 4 general-purpose polished.
    - 2.1.2 On Carbon Steel, Copper Alloy, and Brass: Chromium-plated, bright.
  - 2.2 Miscellaneous Accessory Items:
    - 2.2.1 Mirror, Glass (MG): Glass mirror shall conform to Fed. Spec. DD-M-411.
    - 2.2.2 Mirror, Metal (MM): Metal mirror shall be stainless steel or chromium-plated steel, mirror quality, 0.037-inch minimum thickness, edges turned back 1/4 inch and recess fitted with fiberboard backing, mounted with concealed theftproof fastening. Size shall be as required.
    - 2.2.3 Grab Bar (GB): Grab bar shall conform to Fed. Spec. WW-P-541. Grab bar shall be form and length as required. Flange shall have screw mounting holes concealed on the lip of the flange. Installed bars shall be capable of withstanding a 500-pound vertical load without becoming loose from the fastenings and without obvious permanent deformation.
    - 2.2.4 Shelf, Glass (SG): Glass shelf shall conform to Fed. Spec. WW-P-541 and shall be supported between brackets or on brackets. Shelf shall be plate or float glass, width and length as required. Separate supports shall be stainless steel.
    - 2.2.5 Shelf, Metal, Heavy-Duty (SMHD): Heavy-duty metal shelf shall be stainless steel supported between brackets or on brackets not more than two feet on center. Thickness of shelf and brackets shall be not less than 0.07 inches. Shelf shall have rounded corners with minimum 1/2-inch lipped front edge, designed to support 60 pounds per linear foot. Width and length shall be as required.
    - 2.2.6 Shelf, Metal, Light-Duty (SMLD): Light-duty metal shelf shall conform to Fed. Spec. WW-P-541. Shelf shall be supported between brackets or on brackets. Width and length shall be as required. Shelf and separate supports shall be stainless steel.
    - 2.2.7 Soap and Grab Bar Combination, Recess-Mounted (SGR): Recess-mounted soap and grab bar combination shall conform to Fed. Spec. WW-P-541, stainless steel, modified to provide a grab bar. Plastic insert dish shall be furnished.
    - 2.2.8 Towel Bar (TB): Towel bar shall conform to Fed. Spec. WW-P-541, stainless steel, length as required. Bar shall be minimum 3/4 inch in diameter.
    - 2.2.9 Towel Pin (TP): Towel pin shall have concealed wall fastenings; pin shall be integral with or permanently fastened to wall flange, approximately 4-inch projection.
  - 2.3 Dispensers and Receptacles:
    - 2.3.1 Paper Towel Dispenser (PTD): Paper towel dispenser shall conform to Fed. Spec. WW-P-541.
      - 2.3.1.1 Mounting S, Surface: Style N or O.
      - 2.3.1.2 Mounting R, Recessed: Style P, Q, or T.
    - 2.3.2 Sanitary Napkin and Tampon Disposer (SND): Sanitary napkin and tampon disposer shall conform to Fed. Spec. WW-P-541, stainless steel. Reusable liner of the type standard with the manufacturer shall be provided.
    - 2.3.3 Sanitary Napkin and Tampon Dispenser (SNTD): Sanitary napkin and tampon dispenser shall conform to Fed. Spec. WW-P-541.
    - 2.3.4 Waste receptacle (WR) shall conform to Fed. Spec. WW-P-541.
    - 2.3.5 Facial tissue dispenser (FTD) shall conform to Fed. Spec. WW-P-541.
    - 2.3.6 Toilet tissue dispenser (TTD) shall conform to Fed. Spec. WW-P-541.
    - 2.3.7 Toilet paper holder (TPH) shall conform to Fed. Spec. A-A-2524, roller mounted, 2 support brackets.
    - 2.3.8 Toothbrush and tumbler holder (TTH) shall conform to Fed. Spec. WW-P-541.
    - 2.3.9 Soap dispenser (SD) shall be liquid type consisting of a stainless steel tank with hold capacity of 40 fluid ounces.

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- 2.3.10 Soap holder (SH) shall conform to Fed. Spec. WW-P-541.
- 2.4 Medicine cabinets:
  - 2.4.1 Medicine cabinet (MC) shall conform to Fed. Spec. WW-P-541. Width height, and depth of cabinet shall be as required.
  - 2.4.2 Sliding door cabinet, Class 1, assembly shall be surface-mounted vanity or recessed cabinet with design and lighting arrangement as required.
  - 2.4.3 Swinging door cabinet, Class 2, Design and assembly, including the lighting arrangement, shall be as required. Assembly shall be surface or recess-mounted.
- 2.5 Shower Curtains and Rods:
  - 2.5.1 Shower curtain (SC) shall conform to Fed. Spec. A-A-2398, size as required to suit conditions.
  - 2.5.2 Shower curtain rods (SCR) shall be stainless steel 1 inch OD by 0.049 inch minimum, straight or bent as required to meet installation conditions.
- 2.6 Hand dryer shall be electrically operated conforming to Fed. Spec. W-H-50. Unit shall be surface-mounted, semi-recessed or flush-mounted as required. Cover face shall be polished aluminum, cadmium-plated, polished chrome, stainless steel, or porcelain. Fan shall deliver a minimum of 150 cfm at the discharge end of the nozzle.
- 2.7 Ash urn shall be wall-mounted, paraboloidal shape, two quart capacity conforming to Fed. Spec. RR-A-1255. Urn shall be 22-gauge type 304 stainless steel with satin finish or satin bronze finish.
- 2.8 Janitorial Material:
  - 2.8.1 Mop and broom holder shall be 18-gauge stainless steel, satin finish, 8 inches deep in standard lengths as required.
  - 2.8.2 Utility shelf with mop and broom holders shall be 18-gauge stainless steel, satin finish, 8 inches deep in standard lengths as required.
  - 2.8.3 Pail or ladder hook shall be 12-gauge stainless steel, bright polished finish projecting 8 inches from wall, 6 inches high, and 1 inch wide.
- 2.9 Hospital Accessories:
  - 2.9.1 Foot Operated Soap Dispenser: Dispensing mechanism shall be non-corroding containing a stainless steel hood and shatter-proof container. The unit shall contain a molded rubber foot pump with non-slip base.
  - 2.9.2 Bed Pan Storage Rack: Rack shall be stainless steel surface-mounted providing storage for bed pans and urinals.
- 3.0 EXECUTION: Anchors and fasteners shall be capable of developing a restraining force commensurate with the strength of the accessory to be mounted and shall be well suited for use with the supporting construction. Where exposed fasteners are permitted, they shall have oval heads and finish to match the accessory, except exposed fasteners in designated areas shall be of tamper-proof design.

**Wardrobes**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of wood or steel wardrobes. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacture's recommendations. Demolition and removal of materials shall be as required to support the work.
- 1.1 Design: Wardrobes shall be constructed of either wood or steel at the Contractor's option except when necessary to match existing or where one type is better suited for locality and intended usage. The material selected shall be used throughout the project. Design of wardrobes shall be by the Contractor using specified requirements as a minimum of acceptability. Each wardrobe shall be a complete unit capable of relocation without modifying or adding components, except for anchors and scribes. Common sides or backs between adjacent units are not permissible. The dimensions indicated are for the purpose of establishing general layout. Minor variations necessary to coordinate the details of construction will be permitted. All parts shall be manufactured to standards that will permit replacement without modifying of remaining parts.
- 2.0 PRODUCTS
  - 2.1 Hardware:

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- 2.1.1 Hinges shall be brass or steel, not less than 0.062 inch thick, 5 knuckle, tamper-proof institutional type, joint length not less than 2-1/2 inches, chromium finish or primed for paint finish. When doors are closed, only a smooth beveled and rounded joint shall be exposed. Doors 42 inches and less on the hinged side shall have two hinges; doors more than 42 inches on the hinged side shall have three hinges.
- 2.1.2 Latches: The active door of double doors on the clothes hanging compartment shall be provided with a three-point latching and locking mechanism. The handle shall be of the lever type, of cast brass or bronze, and shall be designed to permit locking by padlocking the handle to a steel keeper with a matching hole. A 14-gauge rectangular corrosion resisting steel shield shall be provided to protect the door from damage at the handle and padlock area. The interior components of the mechanism shall include locking bars or rods not less than 1/2-inch thick, two steel upper guides and two steel lower guides, three-finger cam, and applied strikes or reinforced openings for latching. The handle, keeper, and locking bars or rods shall have a chromium finish, and all other components shall have a chromium, nickel, zinc, or cadmium plated finish. Doors to overhead storage compartment, when separate from clothes hanging compartment doors, shall be provided with a heavy-duty catch and strike which will latch automatically when the overhead storage compartment is closed and which can be released manually when the clothes hanging compartment doors are open.
- 2.1.3 Clothes hanging rods shall be chromium plated or zinc-coated steel tubing approximately 1 inch in diameter and with a minimum wall thickness of 0.083 inch. Clothes hanging rods with exposed ends shall be provided with plastic caps to prevent marring the finish on the inside of the wardrobe.
- 2.1.4 Drawer slides shall be heavy duty 14-gauge steel mating channels equipped with replaceable nylon-tired rollers or self-lubricating double-prong plastic glides located to insure that the drawer will operate freely and smoothly throughout its travel. Slides shall have integral cushioned stops at both ends of the travel, shall permit removal of drawers without tools, and shall be free of excessive play or sag.
- 2.1.5 Silencers of rubber or similar resilient material shall be provided on door frames at close proximity to each latching point to minimize noise when the door is closed. Silencers shall be replaceable.
- 2.1.6 Astragals: Active door of double doors shall be provided with an astragal, full height of the door.
- 2.2 Steel Sheets shall be cold-rolled, commercial quality, stretcher level degree of flatness and of manufacturer's standard gauges specified.
- 2.3 Steel Wardrobe Construction:
  - 2.3.1 Workmanship: Form bends accurately. Cut edges straight and smooth. Holes shall be accurately punched or drilled and have all burrs removed. Extend butt welds the full width of joining edges; grind smooth and flush with adjacent surfaces when on exterior of wardrobes. Resistance welds shall be 3/16-inch minimum diameter and maximum spacing of 8 inches on center. Welds shall be thoroughly fused and sound and free from cracks, fissures, pits, holes, gas pockets, porosity, and undercuttings. Leave no sharp corners or protrusions of any kind in the final assembled wardrobes. Use of mechanical fasteners exposed to exterior of unit shall be limited to those required for application of hardware and scribes.
  - 2.3.2 Base shall be closed type, formed to provide a bearing surface at the floor, and provided with floor mounting holes. Bases constructed as part of the framing and panel members shall be of the same gauge as those members. Bases constructed as separate components shall be not lighter than 16-gauge steel.
  - 2.3.3 Back and side panels shall each be formed of sheet steel not lighter than 22 gauge and shall be reinforced if necessary to impart rigidity to unbroken spans.
  - 2.3.4 Front shall be not lighter than 18-gauge steel and multichannel formed as required to provide strength and rigidity to side panels, top, and bottom without exposing fasteners. Front shall be reinforced as necessary to serve as a stable mount and frame for doors and hardware. Fronts formed as part of side panels shall be equivalent to the specified 18-gauge steel multichannel construction. With the door closed, clearance between door edge and frame shall be uniform and shall not exceed 1/8 inch and door face shall be flush with the face of the front.
  - 2.3.5 Top shall be not lighter than 22-gauge steel, flat exterior surface, and formed as required for

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- securing to back, front and sides.
- 2.3.6 Bottom shall be not lighter than 18-gauge steel and formed as required for securing to back, front and sides.
- 2.3.7 Hat shelf and upper storage shelf shall be not lighter than 18-gauge steel and formed as required for securing to back and sides.
- 2.3.8 Doors shall be of double-wall type with not lighter than 22-gauge steel inside panel and not lighter than 20-gauge outside panel separated by not less than 3/4 inch of rigid mineral insulation cemented between the panels. Doors shall be reinforced or otherwise prepared for the reception of hardware and to provide strength and rigidity to the doors.
- 2.3.9 Scribes and closures shall be not lighter than 20 gauge.
- 2.3.10 Chest Unit shall have top and side of not lighter than 20-gauge steel firmly attached to the wardrobe. Shelves shall be constructed of not lighter than 18-gauge steel. Drawer bodies shall be of not lighter than 22 gauge, and drawer fronts shall be of not lighter than 20 gauge with the top formed to provide a full length integral pull.
- 2.3.11 Finish shall be an approved factory-applied baked-enamel, semi gloss finish in accordance with manufacturer's standard finishes. Color will be selected from manufacturer's standard colors.
- 2.4 Wood Wardrobe Construction:
- 2.4.1 General: Except as otherwise shown or specified, wood wardrobes shall conform to AWI-02 and AWI-01. Plywood for transparent finish shall be hardwood plywood, and one species shall be used throughout. Plywood for paint finish shall be hardwood plywood, or have a medium density impregnated fiber overlay.
- 2.4.2 Wood scribes and closures shall be 3/8-inch minimum thickness and shall match wardrobes. Moldings used in conjunction with scribes and closures and for joints between adjacent wardrobes shall be 5/16- by 1-1/16 inch flat members or 3/4-inch quarter round.
- 2.4.3 Wood Finishes: Interior surfaces shall be given an approved transparent finish, and exterior surfaces shall be given an approved paint finish of the color as selected from manufacturer's standard colors or an approved transparent finish. Surfaces to receive a transparent finish shall be stained to an approved shade and all wood surfaces to be finished shall be filled, sanded smooth, and given not less than two coats of an approved finish coating. Finishing of interior and exterior surfaces shall be part of a continuous shop operation to and including at least the first finish coat in order to minimize warpage.
- 3.0 EXECUTION
- 3.1 Installation: Wardrobes shall be assembled and positioned in accordance with the layout shown, set level, and secured in place. Wardrobes with backs to walls shall be secured to the wall with not less than four fasteners, using one fastener near each corner. Free-standing or island-type installations shall be secured to the floor with not less than four fasteners, using one fastener near each corner. Back-to-back or side-to-side wardrobes shall be secured to each other. Securing of adjacent wardrobes shall be with three fasteners located high, low, and intermediate when a side is involved. Securing of adjacent wardrobes shall be with four fasteners located near the corners when a back-to-back installation is involved. Fasteners to secure metal wardrobes in place shall penetrate two thicknesses of metal at each wardrobe or shall be provided with washers. There shall be no sharp corners or protrusions in the final assembled wardrobes that could be considered harmful to the user or the stored items. Scribes over 14 inches wide shall be secured to the building construction with concealed fasteners at intervals not to exceed 12 inches on center. Hardware shall be adjusted and left in good working order. Doors and drawers shall not stick or bind, but shall operate smoothly and easily. Wardrobes shall be cleaned and protected from damage until acceptance.

**DIVISION 11-EQUIPMENT**

**Platform and Dock Levelers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for replacement, repair, and maintenance of platform and dock levelers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation

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procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Replacement Components:

2.1.1 General: Replacement components shall be new and of matching quality and construction. Every replacement part shall be made to definite standards, tolerances, and clearances and to fit in the existing equipment.

2.1.2 Structural Components: All replacement parts of the equipment to be repaired shall be of such design, size, material, and strength as required to carry and sustain the maximum allowable load placed upon it.

2.1.3 Hydraulic System Components: The hydraulic system shall consist essentially of a hydraulic pump, hydraulic rams, pressure relief valve, fluid reservoir, hydraulic control valves including necessary continuous-duty solenoid valves and check valves, and connections. The system shall be installed as a separate and complete system in each platform unit.

2.1.4 Electrical System Components: All electrical components shall comply with the National Electrical Code. Conduit, outlet boxes, and fittings shall be galvanized. Wire shall comply with Fed. Spec. J-C-30. All materials and equipment shall be rated for wet locations. Insulation resistance shall be not less than 1 megohm.

2.2 Permanent, Self-Forming, and Free Standing Adjustable Dock Levelers: Levelers shall comply with DOC ASME MH14.1 for Class A loading. Minimum live load capacity for rollover and crossover travel shall be 12,000 pounds. Physical dimensions and maximum capacity shall be as designated.

2.3 Permanent Manually Operated Dockboards: Permanent manually operated dockboards shall comply with DOC ASME 14.1 for Class B loading. Minimum live load capacity for rollover and crossover travel shall be 12,000 pounds. Physical dimensions and maximum capacity shall be as designated.

3.0 EXECUTION:

3.1 Repair: Repair shall consist of removal and replacement of various defective equipment components. Installation of hydraulic system components shall be such that no leaks exist in any part of the system. All electrical work shall comply with the National Electrical Code.

3.2 Installation of Equipment: The equipment shall be installed by, or under the supervision of, the manufacturer or his licensee. After installation is complete and equipment is properly adjusted, perform operational and load tests per manufacturer's instructions to ensure that the equipment functions properly and has the specified capacity.

**Platform and Dock Lifts**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for replacement, repair, and maintenance of platform and dock lifts. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Replacement Components:

2.1.1 Structural Components: All replacement parts of The equipment to be repaired shall be of such design, size, material, and strength as required to carry and sustain the maximum allowable load placed upon it.

2.1.2 Hydraulic System Components: Pipe, tubing, fittings, and hydraulic hose shall be designed and constructed with a minimum safety factor of three based on bursting pressure. Cylinders, pumps, and control valves shall be designed to withstand test pressures of 150 percent of the design operating pressure.

2.1.3 Electrical System Components: All electrical components shall comply with the National Electrical Code. Conduit, outlet boxes, and fittings shall be galvanized. Wire shall comply with Fed. Spec. J-C-30. All materials and equipment shall be rated for wet locations. Insulation resistance shall not be less than one megohm.

2.2 Dock lifts shall comply with ASME 14.1. The replacement lift shall have the same capacity, travel, minimum lowered level, and nominal raising and lowering speed as the existing lift.

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- 2.3 Truck Levelers: The truck leveler shall have a capacity of 40,000 pounds. Leveler shall have a total travel of 36 inches, divided as follows: 18 inches up, 18 inches down.
- 3.0 EXECUTION:
- 3.1 Repair: Installation of hydraulic system components shall be such that no leaks exist in any part of the system. All electrical work shall comply with the National Electrical Code.
- 3.2 Installation of Equipment: The equipment shall be installed by, or under the supervision of the manufacturer or his licensee. After installation is complete and equipment is properly adjusted, perform operational and load tests per manufacturer's instructions to ensure that the equipment functions properly and has the specified capacity.

**Platform and Dock Enclosures**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for replacement, repair, and maintenance of platform and dock enclosures. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Fabric shall be hypalon-coated nylon, 5.1 oz. per sq. yd. with 65 percent coating on front and 35 percent on back face. Total weight with coatings shall be 16 oz. per sq. yd.
- 2.2 Thread shall be polyester, heavy-duty minimum-size FF (Size 139) bonded, complying with Fed. Spec. V-T-285.
- 2.3 Wood Framing: Lumber shall be air-dried and well seasoned, to contain not more than 19 percent moisture at time of finishing, identified by official grade marks and shall be Douglas Fir-Larch No. 2 or better, Hemlock-Fir, No. 1 or better, or Southern Pine No. 2 or better. Lumber shall be smooth on all sides.
- 2.4 Pads shall be polyurethane foam with a minimum density of 1.25 pounds per cubic foot and a 35-pound compression factor, open cell construction of an ether base. Foam shall be resilient from -50 F to +180 F. Pads shall be bonded to framing members.
- 2.5 Bottom Pads and Bumpers: Three polyurethane foam pads with cover fabric and two laminated or extruded rubber dock bumpers mounted to a continuous 2-inch by 12-inch wood frame.
- 3.0 EXECUTION: (Section not used.)

**Platform and Dock Bumpers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of platform and dock bumpers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Timber bumpers shall be dense red oak. Ends shall be smooth and edges rounded to a radius of approximately 1/2 inch. All bolt holes shall be countersunk. Bumpers shall be treated in compliance with AWWA P5. Treating process and results shall comply with Fed. Spec. TT-W-571. Retention shall be a minimum of 0.23 pounds of oxide per cubic foot of treated wood.
- 2.2 Laminated rubber bumpers shall be resilient rubber material made from rubberized fabric truck tires cut to uniform size pads and punched to receive 3/4-inch supporting rods. The bumpers shall be closed with 3-inch by 2-1/2 inch by 1/4-inch structural steel angles under approximately 1,500 pounds of pressure. Angles shall be welded to 3/4-inch rods at one end and closed with threaded rod and nuts at the other end. Anchor leg of angle shall extend a minimum of 2-1/2 inches beyond rubber surface at either end and contain 2 or 3 anchor bolt holes.
- 2.3 Extruded rubber bumpers shall be manufactured of extruded ethylene propylene diene monomers (EPDM) hydrocarbon rubber of 70 durometer hardness or higher and with a minimum tensile strength of 2,400 psi. All mounting holes shall be countersunk.
- 3.0 EXECUTION:
- 3.1 Removal of Existing Bumpers: Remove existing bumpers in a manner to prevent damage to the

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surface on which they are mounted. All existing anchor bolts that have deteriorated or are not in proper position to facilitate mounting of new bumpers shall be cut off flush with the base surface. Existing bumpers that have been mounted by welding shall be removed by cutting torch and the resultant mounting surface power ground smooth and flush prior to installation of the new bumper.

- 3.2 Installation of New Bumper: All mounting hardware shall be new except existing expansion shields that are properly located and in suitable condition for reuse. Final installation shall be properly aligned, tight and flush against mounting surface.

**Platform and Dock Warning Devices**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of platform and dock warning devices. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Pavement marking paint shall comply with Fed. Spec. TT-P-115.
  - 2.2 Glass spheres shall have at least 42 percent reflectivity and shall comply with the State Standard Specifications.
  - 2.3 Reflectors shall be acrylic plastic prismatic reflectors complying with the State Standard Specifications.
- 3.0 EXECUTION:
  - 3.1 Preparation: Thoroughly clean all pavement areas to be painted by use of hand brooms, rotary brooms, air blast, scrapers, or other acceptable means that will not damage the surface.
  - 3.2 Installation:
    - 3.2.1 Pavement Marking: Apply paint and glass spheres with mechanical equipment. Apply the paint and glass spheres uniformly to form markings of the dimensions and shapes required. Lines shall be true with sharp edges and ends. The length of lines shall be within plus or minus 3 inches; width shall be within plus or minus 1/8 inch.
    - 3.2.2 Reflectors: Install reflectors at the locations and by the method required. Align and orient reflectors so that proper reflectivity is obtained.

**Platform and Dock Guardrails and Posts**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of platform and dock guardrails and posts. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Steel Guardrail: Steel plate beam guardrail, end sections, and splice plates shall comply with AASHTO M180. Steel posts, restraints, braces, and plates shall be galvanized.
  - 2.2 Materials for Timber Guardrail and Cable Guard Construction: Treated timber shall comply with the NFPA requirements for 1850F dense southern pine or 1900F dense Douglas fir. Wire rope cable and fastenings shall comply with AASHTO M30, Class A.
    - 2.2.1 Offset spring brackets shall have a deflection of one inch under a compression load of not less than 3,500 pounds and not more than 6,000 pounds applied for one minute perpendicular to the line of the cables with the cables in place. The offset spring brackets shall not collapse under a compression load of 10,000 pounds.
    - 2.2.2 Special offset spring brackets of the blunt, slotted, overlapping nose type shall be fabricated from spring steel, tempered, and drawn. The brackets with steel stay pins shall be slotted for 3 cables. Special offset spring brackets shall have a minimum deflection of one inch under a compression load of 15,000 pounds applied for one minute perpendicular to the line of the cables at the points of attachment of the cables and the bracket with the cables in all slots.
- 3.0 EXECUTION:
  - 3.1 Guardrail Removal: Sections of guardrail shall be removed as required to provide access to

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- damaged or deteriorated components.
- 3.2 Guardrail Fabrication and Erection: New guardrail shall be erected in compliance with AASHTO M180 and the construction requirements for the type of guardrail being erected.
    - 3.2.1 Steel plate beam fabrication shall comply with AASHTO M180. Roll or round the edges of the plates so that they present no sharp edges.
    - 3.2.2 Setting Timber and Steel Posts: Set posts in compacted soil to a minimum depth of 3 1/2 feet. Backfill the holes in minimum 6-inch layers with approved materials. Compact each backfill layer in a manner not to displace the posts from correct alignment.
    - 3.2.3 Painting: Steel surfaces that have not been galvanized shall be shop-coated with rust inhibitive primer paint. Give primed surfaces to be painted two coats of white or aluminum paint after erection. Where the surface will be inaccessible after erection, paint before installation.
    - 3.2.4 Cable Guard: The offset brackets shall be attached to each post by means of one or more bolts not less than 3/4 inch in diameter inserted through the bracket and the post with the threaded end of the bolts at the back of the post. All bolts except adjustment bolts shall be drawn tight, and all bolts shall be sufficiently long to extend at least 1/4 inch beyond the nuts. After the posts and offset brackets have been set, the cables shall be erected and stretched taut by an approved mechanical device. The completed assembly shall provide a smooth, continuous platform and dock guard conforming to the required line and grade. After the cable has been stretched in its final position, the takeup on adjustment bolts, intermediate anchors, and end anchors shall be made as necessary.

**Mixing Chambers and Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of water treatment plant mixing chambers and equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Concrete repair material shall be epoxy type grout in compliance with Applicable standards and/or.
  - 2.2 Baffle Repair and Replacement Parts: Material and accessories for baffle repair or replacement parts shall be chemically resistant to the chemicals being mixed in the mixing chamber.
  - 2.3 Air agitation system repair and replacement parts such as diffuser, pipe, and fittings shall match the existing equipment.
  - 2.4 Mixing Chamber Drive Equipment: Multiple V-belt drives shall be furnished in matched sets.
- 3.0 EXECUTION:
  - 3.1 Preparation: Alternate Mixing Chamber and appurtenances shall be furnished, installed, and removed after completion of work by the Contractor.
  - 3.2 Installation:
    - 3.2.1 Static mixer shall be cleaned and repaired.
    - 3.2.2 Mixing chamber baffles: Drain the mixing chamber and repair or replace the baffles as required.
    - 3.2.3 Mixing Chamber Drive Equipment:
      - 3.2.3.1 Gear Drive: Maintenance and Repair Procedures shall be such that they will result in the equipment being able to operate at its rated capacity.
      - 3.2.3.2 Cleaning: Accumulated dirt, oil, grease, and debris shall be removed from the parts.
      - 3.2.3.3 Testing: Repaired equipment shall be tested ensure that it operates at design conditions and rated capacity. Replace and retest equipment failing to meet test conditions.

**Clarifiers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for the repair and maintenance of sewage treatment plant clarifiers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:

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- 2.1 Epoxy filler compound for concrete surfaces shall comply with Applicable standards and/or.
- 2.2 Coal-tar epoxy shall comply with SSPC-PAINT 16.
- 2.3 Epoxy paint shall comply with Mil. Spec. MIL-P-24441.
- 2.4 Red-lead base paint shall comply with Fed. Spec. TT-P-86, Type 1.
- 2.5 Finish coat paint shall comply with Fed. Spec. TT-P-38.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Cleaning: Prior to removing parts or components of the clarifier or appurtenant equipment, clean dust, dirt, grime, and other foreign matter from the surfaces.
    - 3.1.2 Interior concrete surfaces of the clarifier tank shall be cleaned with high pressure water or steam to remove all dirt and residue, allowed to dry, and brush sandblasted in compliance with SSPC-SP 7.
    - 3.1.3 Interruptions of Treatment: Not more than one clarifier shall be taken out of service at a time.
  - 3.2 Installation:
    - 3.2.1 Holes and voids in the concrete surfaces left from the blast cleaning shall be filled by means of troweling and squeeze application of an epoxy filler. The surfacing materials shall be allowed to cure overnight, and then two coats of Coal-tar epoxy shall be applied.
    - 3.2.2 Submerged ferrous metal surfaces, such as piping, ladders, structural steel, equipment, and metal roof surfaces that are exposed to the sludge shall be sandblasted in compliance with SSPC-SP 10 and coated with two coats of coal-tar epoxy.
    - 3.2.3 Clean exterior concrete surfaces of the clarifier by means of brush sandblast in compliance with SSPC-SP 7, blow down the surfaces with air to remove the blasting residue and dust, and apply two coats of epoxy-polyamide paint.
    - 3.2.4 Ferrous metal surfaces that are not submerged shall be cleaned by means of sandblasting in compliance with SSPC-SP 6. Surfaces inaccessible to sandblasting shall be power tool cleaned in compliance with SSPC-SP 3. Surfaces shall be coated with one coat of red-lead base paint. After the base paint has dried sufficiently, two coats of Aluminum finish paint shall be applied.
    - 3.2.5 Startup: After completion of maintenance and repairs, the clarifier shall be started up and operating adjustments shall be made by the Contractor as required to achieve the design flow rate and quality of the effluent.

**Aeration Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of water treatment plant aeration equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Media for tray type aeration equipment shall be coke, stone, or factory-made ceramic balls, 2 to 6 inches in diameter.
  - 2.2 Trays: Tray repair and replacement parts shall be of the same kind of material or shall be compatible with existing trays.
- 3.0 EXECUTION:
  - 3.1 Preparation: Pipe, valves, and fittings to install a bypass around the aerator shall be provided.
  - 3.2 Installation:
    - 3.2.1 Enclosure Repairs: Repair or replace screens, screen frames, and structural parts of the aeration equipment as required.
    - 3.2.2 Defective media shall be removed and new media added, or the defective media shall be replaced with new media.
    - 3.2.3 Repair and Replacement of Trays: Repair or replace trays as required. Drain and clean trays. Remove media, if necessary, to accomplish the repairs, and replace media after the repairs are complete.
    - 3.2.4 Flame Cutting: No cutting by torch or flame shall be done without written authorization from the Authorized Member Representative.
    - 3.2.5 Testing: After repairs are completed, test the equipment to ensure that it will operate at design

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conditions.

**Chemical Bypass Feeders**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of chemical bypass feeders for water treatment systems. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Bypass feeders shall be used to control corrosion, inhibit lime scale formation, and remove dissolved iron in small water systems.
  - 2.1 In-line mount unit shall be equipped with built-in bypass and shutoff valves and hold pressures up to 125 psi.
  - 2.2 Floor mount unit shall be equipped with 5-, 10-, or 12-gallon capacity feeder tanks, lockable filler cap, one short and one long slotted strainer, flow indicator, drain cock, and shutoff valves. The flow indicator shall consist of a transparent pyrex glass cylinder. The unit shall hold pressures up to 175 psi.
- 3.0 EXECUTION:
  - 3.1 In-line mount unit feeder shall be installed before the pressure tank to prevent rust deposition. To prevent corrosion, the unit shall be installed on the inlet line to the heater.
  - 3.2 Floor mount unit feeder unit shall be installed in a bypass on the cold water line to the equipment to be protected against corrosion or lime scale problems.
    - 3.2.1 Water Heater Protection: Feeder shall be placed before a water heater but far enough away so that hot water will not flow back into the feeder.
    - 3.2.2 Private Well Systems: The feeder shall be installed before the water storage tank.
    - 3.2.3 Pressure Relief Valve: A pressure relief valve shall be installed on either the inlet or outlet line between the shutoff valve and the feeder when feeding chemicals that generate excess heat and pressure upon contact with water.

**Chemical Storage Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of water treatment plant chemical storage equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Solution tank repair material shall be PVC in compliance with ASTM D 1784, polyethylene in compliance with ASTM D 1248, or fiberglass.
  - 2.2 Manhole gasket material shall be chemically resistant to the material stored in the bin.
- 3.0 EXECUTION:
  - 3.1 Repair and Replacement of Parts: The equipment shall be cleaned and repaired, parts shall be replaced as required, and the equipment lubricated and adjusted to operate properly.
  - 3.2 Stored material shall be removed from the chemical storage bin, the bin cleaned and repaired, and the stored material replaced in the bin.
  - 3.3 Manhole Cover and Gasket shall be removed, gasket sealing surfaces cleaned, new gasket installed, and the manhole cover reinstalled.
  - 3.4 Welding shall comply with AWS D1.1.
  - 3.5 Testing: After repairs are completed, the equipment shall operate at design conditions.

**Water Treatment Plant Scales And Weighing Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of water treatment plant scales and weighing equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

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- 2.0 PRODUCTS: (Section Not Used.)
- 3.0 EXECUTION:
- 3.1 Testing and Adjustment: Test and adjust controls to have same accuracy as originally guaranteed by the manufacturer.
- 3.2 Sealing: After testing and adjustment, the scale shall be sealed by the Contractor to prevent unauthorized tampering that might affect its accuracy.

**Ion Exchange Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of water treatment plant ion exchange equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Exchange Column Vessels: Welding rods and shell material that are compatible with the steel of the vessel shall be used for leak repair. Welding rods shall comply with ASME Boiler and Pressure Vessel Code, Section II.
- 2.2 Vessel lining or coating repair material shall be compatible with the existing lining or coating.
- 2.3 Ion exchange resins, cation, or anion used for replacement shall be as originally specified by the equipment manufacturer or approved equivalent.
- 3.0 EXECUTION:
- 3.1 Exchange Column:
  - 3.1.1 Vessel repair welding shall comply with the applicable requirements of ASME Boiler and Pressure Vessel Code, Section IX.
  - 3.1.2 Structural welding shall comply with the applicable requirements of AWS D1.1.
- 3.2 Controllers and Analyzers: The following equipment shall be cleaned and shall have defective ports repaired or replaced to restore the items to their original operating condition:
  - Flow Control
  - Totalizer
  - Sequence Controller
  - Time Delay Relay
  - Drum Controller
  - Automatic Analyzer
  - Conducting Meter
  - Sample Conditioning Equipment

**Softening Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of water treatment plant softening equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Concrete repair material for chemical storage bins and sedimentation basins shall comply with Applicable standards and/or.
- 2.2 Manhole gasket material shall be as recommended by the bin fabricator and shall be chemically resistant to the material stored in the bin.
- 2.3 Bin vent system repair and replacement parts shall be as recommended by the manufacturer, or equivalent.
- 2.4 Replacement parts for the sedimentation tank mechanism, drive system, and appurtenances shall be as recommended by the manufacturer of the equipment, or equivalent.
- 3.0 EXECUTION:
- 3.1 Carbon Dioxide Diffusion System: Maintenance and repair shall result in the recarbonation system being restored to its design capacity.

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- 3.2 Manhole Gasket: Manhole cover and gasket shall be removed, seated surfaces shall be cleaned, a replacement gasket shall be put in place, and the manhole cover shall be reinstalled.
- 3.3 Bin Vent System: Parts shall be cleaned and repaired or replaced.
- 3.4 Testing: Mixers shall be tested to ensure that they operate at their rated capacity. The diffusion system shall be tested for leaks, carbon dioxide flow rate, and pH change in the water. Bin(s), vent system, and appurtenances shall be tested to ensure operation at design conditions. Tanks and connecting lines shall be examined for leaks after being filled to operating level, and leaks shall be repaired.
- 3.5 Access: Softening equipment parts or appurtenances that interfere with access to or performance of the work shall be removed and replaced after the work has been completed.

**Chlorine Contact Tanks**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of water treatment plant chlorine contact tanks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Bolts, nuts, and screws removed due to repair work shall be replaced with new bolts or screws of the same type, size, and finish, complying with ASTM A 193, Grade B8. Replacement nuts of the same type, size, and finish shall comply with ASTM A 194, Class 8F.
  - 2.2 Finishes: Items replacing existing items that are galvanized, plated, painted, or otherwise finished, shall be finished with like finish.
  - 2.3 Concrete repair material shall be epoxy type grout in compliance with Applicable standards and/or.
- 3.0 EXECUTION:
  - 3.1 Tank shall be cleaned and repaired with the corroded parts replaced as required.
  - 3.2 Testing: After repairs are completed, test the equipment to ensure that it operates at designed conditions.

**Disinfection Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for water and sewage treatment plant disinfection equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Chlorinator: The chlorinator shall be wall- or cabinet-mounted, shall be a vacuum-operated solution-feed type, and shall include an integral manifold trap complete with a built-in electric heater. The manifold shall have a removable chlorine filter with a 5-square inch filtering area. A positive tight shutoff valve shall be provided within the chlorinator to isolate gas under pressure from the control system should there be a loss of vacuum. An easily removable basket with filter screen shall be included upstream of the inlet valve. A spring-operated pressure relief valve shall be provided to prevent the buildup of pressure within the gas control system. An excess vacuum shutoff valve, which isolates the regulator and gas supply system from the ejector on loss of gas pressure shall be supplied. Provisions for automatic changeover shall be incorporated within the vacuum regulator without the need for an external valve. An indicator shall provide a visual signal when the chlorine gas supply is exhausted or interrupted.
  - 2.2 Gas Injector: The injector of diffuser shall be polyvinyl chloride (PVC) in compliance with ASTM D 1784. The ejector shall be provided with dual check valves as well as an emergency drain valve to protect against flooding of the vacuum regulator.
  - 2.3 The unit shall be supplied with the following accessories: metering tube supply indicator, rate valve, 50 feet of 5/8-inch polyethylene tubing for vent and vacuum lines, insect screen, bottle of ammonia solution, spare gaskets, thread lubricant, a flexible connector, and a universal wrench.
- 3.0 EXECUTION:

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- 3.1 Installation: The chlorine feeding machines and all equipment appurtenances shall be installed in accordance with the Chlorine Institute, Inc. Chlorine Manual and Pamphlet 6 so as to provide a complete and integrated system.
- 3.2 Testing: After installation of the chlorine feeding machine and evaporators is complete, operating tests shall be carried out to ensure that the chlorine feeding installation operates properly. All piping shall be tested hydrostatically and for leaks. If any deficiencies are revealed during any tests, such deficiencies shall be corrected, and the tests shall be reconducted.

**Gaseous Chemical Metering Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for the repair and maintenance of gaseous chemical metering equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Gas injectors shall be PVC plastic in compliance with ASTM D 1784.
  - 2.2 Gas Evaporators:
    - 2.2.1 Electrical heating elements shall be flat rod, immersion type.
    - 2.2.2 Wiring, Switch, Thermostat, and Alarm Switch: Load rating of wiring, switch, thermostat, and alarm switch shall be equal to or greater than the load rating of the wiring, switch, thermostat, and alarm switch to be replaced.
- 3.0 EXECUTION:
  - 3.1 General: The gas injector, gas evaporator, and chemical metering equipment shall be cleaned and repaired.
  - 3.2 Testing: Each piece of equipment shall be tested and adjusted to operate properly over its capacity range.
  - 3.3 Leak Tests: Piping, tubing, vessels, or jackets that are part of the equipment being repaired shall be tested for leaks at one and a half times normal working pressure.
  - 3.4 Calibration: Metering equipment shall be calibrated in compliance with manufacturer's instructions.
  - 3.5 Safety precautions pertaining to chlorine shall be in compliance with the Chlorine Institute, Inc. Chlorine Manual.

**Sewage Ejectors, Submersible**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of submersible sewage ejectors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: The sewage ejectors shall be of the simplex or duplex pneumatic type and shall be complete with receivers, compressors, electric motors, control equipment, piping, and all necessary accessories.
  - 2.1 Sewage Receivers: Sewage receivers shall be of cast-iron or welded-steel construction conforming to the ASME Code, Section VIII for Pressure Vessels. Sewage inflow and outflow pipe connections shall be flanged; air-supply and vent-piping connections shall be screwed. Pipe threads shall conform to Fed. Std. H28 and pipe flanges shall conform to ASTM A 53. The receiver shall be tested at a pressure 50 percent greater than the working pressure. Each receiver shall be provided with suitable support and a manhole or handhole conveniently located. Steel receivers shall be coated inside and outside with coal-tar primer and enamel conforming to the requirements of AWWA C203 in all respects of materials and application, or shall be coated with a Coal-tar Epoxy paint system conforming to the requirements of SSPC-PS 11.01.
  - 2.2 Air Compressor: Each compressor shall be equipped with suction silencer, complete automatic lubrication system, an air filter, and adequate means for cooling. The operating speed of the air compressors shall not exceed 1,800 rpm. Installation of the air compressor shall conform to ASME B19.1.

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- 2.3 Air Reservoir: If the equipment furnished requires a compressed air reservoir for proper operation, the tank shall be constructed in conformance with ASME Boiler and Pressure Vessel Code, Section VIII, with flanged or screwed inlet and outlet connections as required. The storage tank shall be tested at a pressure 50 percent greater than the working pressure. The tank shall be fitted with a pressure gauge, inspection openings, blowoff cock, and a safety valve. The connection to the compressor shall be provided with a check valve and a shutoff valve.
- 2.4 Electric Motor: Each electric motor shall conform to NEMA MG 1. Temperature rise shall be based on 40 C ambient temperature.
- 2.5 Controls: An automatic control system shall be provided for each ejector.
- 2.6 Piping: The sewage influent and effluent lines be flanged cast iron. The air piping shall be wrought iron or steel with malleable-iron units and fittings. Pipe hangers and supports shall be spaced at not more than 10 feet on center.
- 2.7 Check Valves: AWWA C508, except that valves on the discharge side of the receivers shall be provided with replaceable valve seats.
- 2.8 Gate Valves:
  - 2.8.1 Cast Iron: AWWA C500, Class 125, Grade A, Design NRS, flanged ends.
  - 2.8.2 Bronze: MSS SP-80, Type I, Class 125.
- 2.9 Motor Controls: NEMA ICS 2.
- 2.10 Pipe:
  - 2.10.1 Cast Iron: Fed. Spec. WW-P-421, Class 150, as applicable to pipe barrel only. AWWA C110/A21.10, Class 125, for pipe flange.
  - 2.10.2 Steel: ASTM A 53, Grade B, Type E or S, zinc coated.
- 2.11 Pipe Fittings:
  - 2.11.1 Cast Iron: ANSI B16.1.
  - 2.11.2 Malleable Iron: Fed. Spec. WW-P-521, Type II.
  - 2.11.3 Malleable Iron Unions: Fed. Spec. WW-U-531, Type B.
- 2.12 Pipe Hangers and Supports: MSS SP-58 and SP-69.
- 3.0 EXECUTION:
  - 3.1 Valves: Valves installed in the wrought-iron and steel pipeline shall be bronze with screwed ends and valves installed in the cast-iron pipeline shall have bronze-mounted iron bodies with flanged ends. Gate valves shall be opened by turning counterclockwise.
  - 3.2 Concrete foundations shall be integral with and of the same concrete as the building floor unless otherwise directed. 4,000 psi concrete shall be used in foundations that are entirely separated from the surrounding floor. Foundation bolts, as required, shall be provided for proper positioning during the placement of the concrete.
  - 3.3 Bolts, nuts, anchors, washers, and all other types of necessary supports shall be of wrought iron or steel galvanized according to ASTM A 153.

**Centrifuges**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for the repair and maintenance of sewage treatment plant centrifuges. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: (Section not used.)
- 3.0 EXECUTION:
  - 3.1 Preparation: Clean centrifuge thoroughly of sludge and residue prior to commencing maintenance and repair.
  - 3.2 Installation:
    - 3.2.1 Repair and Replacement of Parts: The equipment shall be cleaned and repaired, and parts shall be replaced as required.
    - 3.2.2 Lubrication: Friction parts shall be lubricated with proper lubricants. Oil and grease shall be removed from surfaces and parts not intended to be oiled or greased.

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**Grit Chambers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of sewage treatment plant grit chambers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Epoxy filler compound for concrete surfaces shall comply with Applicable standards and/or.
  - 2.2 Coal-tar epoxy shall comply with SSPC-PAINT 16.
  - 2.3 Epoxy paint shall comply with Mil. Spec. MIL-P-24441.
  - 2.4 Red-lead base paint shall comply with Fed. Spec. TT-P-86, Type 1.
  - 2.5 Finish coat paint shall comply with Fed. Spec. TT-P-38.
- 3.0 EXECUTION:
  - 3.1 Interruption of Sewage Treatment: Not more than one grit chamber shall be taken out of service at a time.
  - 3.2 Installation:
    - 3.2.2 Dust Control: Adequate provisions shall be made to prevent the transfer of dust to other equipment and to areas occupied by Member personnel.
    - 3.2.3 Grit Chamber Cleaning and Coating: Grit chamber shall be cleaned and coated as follows:
      - 3.2.3.1 Interior concrete surfaces of the grit chambers shall be cleaned with high pressure water or steam to remove dirt and residue, allowed to dry, and brush sandblasted.
      - 3.2.3.2 Holes and voids in the concrete surfaces left from the blast cleaning shall be filled by means of troweling and squeeze application of an epoxy filler. Apply two coats of Coal-tar epoxy to the surface after the epoxy has cured.
      - 3.2.3.3 Submerged ferrous metal surfaces such as piping, ladders, structural steel, and equipment that are exposed to the sewage shall be sandblasted and coated with two coats of coal-tar epoxy.
      - 3.2.3.4 Exterior concrete surfaces shall be cleaned by means of brush sandblast, the surfaces blown down with air to remove the blasting residue and dust, and two coats of epoxy-polyamide applied.
      - 3.2.3.5 Ferrous metal surfaces that are not submerged shall be cleaned by means of sandblasting. Coat surfaces with one coat of red-lead base paint. After the base paint has dried sufficiently, apply two coats of Aluminum finish paint.

**Micro-Screens**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for the repair and maintenance of sewage treatment plant micro-screens and filter screens. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Replacement parts shall have the same characteristics as the parts to be replaced, unless otherwise approved.
- 3.0 EXECUTION:
  - 3.1 General: Screen, wash pumps, controller, drive equipment, and appurtenances shall be repaired or replaced, lubricated, and placed in service as required.
  - 3.2 Waste outlet shall be flushed and cleaned with high pressure water or steam or by rodding.
  - 3.3 Stopping Screen Unit: If, for any reason, the unit must be stopped, it shall be carefully drained down and the fabric shall be cleaned. The drum shall never be left standing for any length of time in a tank of dirty water. To the extent feasible, the interior and exterior water levels shall be maintained nearly equal, the drum kept constantly turning, and the backwashing spray left on until the tank has been drained.
  - 3.4 Startup of Screen Unit: After testing for rotation, admit water at a slow rate to the micro-screen tank. Water levels on both sides of the screen shall be equalized during filling. Keep the drum rotating and turn the washwater supply on. Since initial filling of the tank may entrain many impurities, watch the operation of the unit carefully to avoid problems with backwashing and, if

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required, supplement washwater sprays with hose streams to keep the screen clean during the tank filling operation.

3.5 Cleaning Screen:

3.5.1 Cleaning of slime from the filter screen shall be accomplished by shock chlorination using sodium hypochlorite solution or other acceptable methods. After treatment, drain and flush the tank to waste prior to returning the micro-screen to service.

3.5.2 Cleaning of iron or manganese oxide film from the filter screen shall be accomplished by using an inhibited acid cleanser.

3.5.3 Clean grease from the surface of filter screen panels by the use of steam.

**Comminutors and Bar Screens**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of sewage treatment plant comminutors and bar screens. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Motor: Unless otherwise directed, replacement motors shall be rated for continuous operation.

2.2 Electrical Work: Electrical wiring shall comply with the requirements of NFPA 70.

2.3 Cutter blades shall be cobalt-chromium-tungsten alloy faced.

2.4 Fasteners shall be stainless steel.

3.0 EXECUTION:

3.1 Motor bearings shall be lubricated or replaced.

3.2 Welding shall be done by qualified welders in compliance with AWS D1.1.

**Rotating Biological Filters**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for the repair and maintenance of sewage treatment plant rotating biological filters. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Steel Parts: Steel parts shall be fabricated from new stock conforming to ASTM A 366.

2.2 Hardware:

2.2.1 Bolts and Nuts: ASTM A 307.

2.2.2 Washers, Flat and Lock Type: ANSI B18.22.1.

2.3 Rust Inhibitive Primer: Fed. Spec. TT-P-664.

2.4 Galvanizing: ASTM A 123 and A 153.

3.0 EXECUTION:

3.1 Welding: Welding shall be in conformance with the AWS D1.1. Galvanized or painted surfaces destroyed by welding shall be restored to original surface for corrosion protection.

3.2 Shop Coating: All structural and miscellaneous metal items shall be painted or galvanized as required.

3.3 Lubrication: Lubricate all motors, chains, drive units, and bearings in compliance with the equipment manufacturer's instructions.

**Vacuum Filters**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of sewage treatment plant vacuum filters. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Ferrous metal surfaces not exposed to sewage shall be coated with red-lead paint complying with

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- Fed. Spec. TT-P-86, Type 1, with finish coats of aluminum paint complying with Fed. Spec. TT-P-38.
- 2.2 Ferrous metal surfaces exposed to sewage shall be coated with a coal-tar epoxy-polyamide paint complying with SSPC Paint 16.
  - 3.0 EXECUTION:
    - 3.1 Preparation:
      - 3.1.1 Cleaning: Prior to removing parts or components of the vacuum filter or appurtenant equipment, clean dust, dirt, grime, and other foreign matter from the surfaces.
      - 3.1.2 Interruption of Treatment: Provide temporary bypass piping required during the performance of the work, and remove when no longer required.
    - 3.2 Installation:
      - 3.2.1 Openings in exterior walls or floor left by removal of a piece of equipment shall be closed to the weather. Remove temporary closures upon installation of the equipment.
      - 3.2.2 Ferrous metal surfaces exposed to sewage shall be sandblasted in compliance with SSPC-SP 10. After the necessary surface preparation has been accomplished, apply two coats of Coal-tar epoxy to a dry film thickness of 10 mils per coat.
      - 3.2.3 Ferrous metal surfaces not exposed to sewage shall have a surface preparation in compliance with the manufacturer's instructions and be coated with a primer and finish coat.

**Sludge Drying Beds**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of sewage treatment plant sludge drying beds. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Liner Repair Material: Plastic liner and bonding cement shall be compatible with the existing liner.
  - 2.2 Sand: Sand shall have an effective grain size of 0.3 to 0.75 mm and a uniformity coefficient of not over 40.
  - 2.3 Gravel shall be coarse, medium, and fine gravel suitable for supporting sand bed. Top three inches shall be 1/8 inch to 3/4 inch in size.
- 3.0 EXECUTION:
  - 3.1 Walls shall be restored to original condition. Minor repairs may be made with concrete repair material.
  - 3.2 Gate repair shall be done by qualified welders in compliance with AWS D1.1.
  - 3.3 Liner repair shall comply with liner fabricator's recommendations.
  - 3.4 Underdrain Repair: Clean, unplug, repair, or replace underdrains as required. •11365

**Trickling Filter**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for the repair and maintenance of sewage treatment plant trickling filters. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Filter media shall be crushed traprock, granite, limestone, hard coal, coke, cinders, blast furnace slag, rot-resistant wood, ceramic, or plastic materials.
    - 2.1.1 Media shall be free of most fine material.
    - 2.1.2 Media size shall comply with ASCE-02, grading size 3-1/2 to 2-1/2 inches.
  - 2.2 Distribution Arms: Pipe, nozzles, and drive parts shall be as recommended by the equipment manufacturer.
  - 2.3 Underdrain System:
    - 2.3.1 Vitrified Clay Underdrain: ASTM C 159.
    - 2.3.2 Concrete Underdrain: ASTM C 654.

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2.3.3 Perforated Vitrified Clay Pipe and Fittings: ASTM C 700.

2.3.4 Vitrified Clay Pipe and Fittings: ASTM C 301.

3.0 EXECUTION:

3.1 Filter Media: Place media to avoid damage, displacement, or clogging of the underdrains, in layers not exceeding 18 inches in depth, to ensure uniform vertical and horizontal distribution of size throughout the filter.

3.2 Distribution Arms Seals: Replace mechanical seal parts as recommended by the manufacturer. Replace mercury seals with mechanical seals.

3.3 Underdrain Collection System:

3.3.1 Underdrain blocks shall be arranged in rows without anchoring and with space maintained by lug. Opening shall be free and unobstructed to the passage of water.

3.3.2 Perforated pipe shall be firmly supported with sand bedding.

3.3.3 Open-spaced pipe shall be installed in compliance with ASTM C 12.

3.3.4 Patented filter under drain systems shall be installed as detailed in the manufacturer's published data.

**Aeration Tanks**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of sewage treatment plant aeration tanks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Coatings:

2.1.1 Epoxy filler compound for concrete surfaces shall comply with Applicable standards and/or.

2.1.2 Coal-tar epoxy shall comply with SSPC-PAINT 16.

2.1.3 Epoxy paint shall comply with Mil. Spec. MIL-P-24441.

2.1.4 Red-lead base paint shall comply with Fed. Spec. TT-P-86, Type 1.

2.1.5 Shall comply with Fed. Spec. TT-P-38.

2.2 Steel plate shall comply with ASTM A 827.

3.0 EXECUTION:

3.1 Interior concrete surfaces of the tank shall be cleaned with high pressure water or steam to remove all dirt and residue, allowed to dry, and brush sandblasted in compliance with SSPC-SP 7.

3.2 Holes and voids in the concrete surfaces left from the blast cleaning shall be filled by means of troweling and squeeze application of an epoxy filler. The surfacing material shall be allowed to cure overnight and coated with two coats of coal-tar epoxy.

3.3 Holes and cracks in steel tank surfaces shall be cut back to solid metal with a torch. Steel plate of thickness equal to, or greater than, the existing steel tank shall be welded to the surface in compliance with AWS D1.1.

3.4 Submerged ferrous metal surfaces that are exposed to liquids shall be sandblasted in compliance with SSPC-SP 10 and coated with two coats of coal-tar.

3.5 The exterior concrete surfaces of the tank shall be cleaned by means of brush sandblast in compliance with SSPC-SP 7. The surfaces shall be blown down with air to remove the blasting residue and dust, and two coats of epoxy-polyamide paint applied.

3.6 Ferrous metal surfaces that are not submerged shall be cleaned by means of sandblasting in compliance with SSPC-SP 3. Surfaces inaccessible to sandblasting shall be power tool cleaned in compliance with SSPC-SP 3. Surfaces shall be coated with one coat of red-lead base paint. After the base paint has dried sufficiently, two coats of Aluminum finish paint shall be applied.

**Surface Aerators**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for surface aeration equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required

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to support the work.

- 2.0 PRODUCTS: The floating power assembly shall consist of an aerator motor, motor support-deflector, drive shaft and coupling, replaceable shaft sleeve and bearing, weedless or nonfouling propeller, and mounting hardware to attach the power assembly to the float assembly. The power assembly shall be high or low speed, as required.
- 2.1 Aerator Motor: The aerator motor shall be a vertical, totally enclosed, fan-cooled motor.
- 2.2 Motor Support Deflector: Support for the aerator motor shall be provided by a conically shaped, all fiberglass or stainless steel structure designed to carry the static and dynamic forces imposed upon the rotating assembly and the propeller.
- 2.3 Drive Shaft and Coupling: The propeller drive shaft shall be rigidly coupled with a compression type coupling to the standard motor shaft extension. Each drive shaft shall be equipped with a replaceable austenitic stainless steel shaft sleeve at the apex of the conical motor support-deflector.
- 2.4 Propeller and Supporting Hardware: The propeller shall be manufactured of cast manganese bronze or stainless steel. Blade design shall be two- or three-blade anti-fouling, with sweptback leading edge.
- 2.5 Float Assembly: The flotation unit shall be constructed of polyester resin reinforced with fiberglass mat and woven glass roving. It shall be internally filled with high-density polyurethane, foamed-in-place and completely sealed from the external environment.
- 2.6 Mooring Cable: The aerators shall be moored with 1/4-inch stain-less steel mooring cable. The mooring cables shall be attached to eye bolts anchored into blocks of concrete.
- 2.7 Electric Cable: Each aerator shall be furnished with the type and amount of underwater electric cable required.
- 3.0 EXECUTION:
- 3.1 Operating Performance: Each aerator shall be capable of high oxygenation by entraining and disbursing atmospheric oxygen at designated minimum rate under standard conditions and with the motor not loaded over 100 percent of its rated capacity. The rotating assembly and propeller of each unit shall be statically, dynamically, and hydraulically balanced so that under normal operating conditions, the motor and unit will operate smoothly, and the vibration measured at the top of the motor shall not exceed established limits for industrial equipment of the same horsepower and motor speed. Aerators shall remain stable and not whirl, process, or otherwise exhibit erratic behavior that may result in damage or fatigue to itself or its accessories.
- 3.2 Maintenance: Aerator units shall be so designed as to require a minimum of maintenance consisting only of lubrications of the upper and lower motor bearings twice a year in accordance with the manufacturer's instructions.

**Sludge Digesters**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installing of materials for repair and maintenance of sewage treatment plant sludge digesters. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Coatings:
  - 2.1.1 Epoxy filler compound for concrete surfaces shall comply with Applicable standards and/or.
  - 2.1.2 Coal-tar epoxy shall comply with SSPC-PAINT 16.
  - 2.1.3 Epoxy paint shall comply with Mil. Spec. MIL-P-24441.
  - 2.1.4 Red-lead base paint shall comply with Fed. Spec. TT-P-86, Type 1.
  - 2.1.5 Aluminum finish paint shall comply with Fed. Spec. TT-P-38.
- 3.0 EXECUTION:
- 3.1 Preparation:
  - 3.1.1 Protection required to prevent damage to adjacent materials, equipment, fixtures, and finishes shall be provided. Purge gas from anaerobic sludge digester tanks, covers, piping, equipment, and control buildings to prevent explosion, fire, or oxygen starvation of personnel.

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- 3.1.2 Interruption of treatment shall be held to a minimum. Not more than one sludge digester shall be taken out of service at a time.
- 3.2 Installation:
  - 3.2.1 Emptying digester: Specified sludge digester(s) shall be emptied. Sludge digester emptying procedure shall be as follows:
    - 3.2.1.1 Methane formation shall be stopped and existing methane purged from under the digester cover, in the cover, in gas lines, equipment, and control building. After discontinuing the sludge feed, allow 3 days for the partial digestion of the last sludge added. When the rate of gas production indicates that most of the sludge has been digested, sludge heating shall be stopped. The gas space under the cover shall be purged with nitrogen or carbon dioxide. When the methane concentration is well below the lower explosive limit of 5.3 percent by volume, open all cover manholes and withdraw the contents of the digester.
    - 3.2.1.2 When draining an anaerobic sludge digester with a floating or gasholder cover, the Contractor shall continuously observe the cover until the cover is resting on the corbels. If the cover should tilt or bind, withdrawal shall be stopped immediately and the problem corrected prior to resumption of the draining operation. As the cover contacts the corbels, the cover shall be watched for signs of structural failure that could damage piping and equipment in the sludge digester tank.
  - 3.2.2 Digester Cleaning and Coatings:
    - 3.2.2.1 Interior concrete surfaces of the sludge digester tank shall be cleaned with high pressure water or steam to remove dirt and residue, allowed to dry, and brush sandblasted in compliance with SSPC-SP 7.
    - 3.2.2.2 Holes and voids in the concrete surfaces left from the blast cleaning shall be filled by means of troweling and squeeze application of an epoxy filler. Epoxy shall be applied in compliance with the manufacturer's application instructions. Two coats of Coal-tar epoxy shall be applied after the surface material has cured.
    - 3.2.2.3 Submerged ferrous metal surfaces such as piping, ladders, structural steel, equipment, and metal roof surfaces that are exposed to the sludge shall be sandblasted in compliance with SSPC-SP 10 and coated with two coats of coal-tar epoxy.
    - 3.2.2.4 Exterior Concrete Surfaces of the digester shall be cleaned by means of brush sandblast in compliance with SSPC-SP 7, the surfaces blown down with air to remove the blasting residue and dust, and two coats of epoxy-polyamide paint applied.
    - 3.2.2.5 Ferrous metal surfaces that are not submerged shall be cleaned by means of sandblasting in compliance with SSPC-SP 6. Surfaces inaccessible to sandblasting shall be power tool cleaned in compliance with SSPC-SP 8. Surfaces shall be coated with one coat of red-lead base paint. After the base paint has dried sufficiently, two coats of Aluminum finish paint shall be applied.
  - 3.2.3 Hydrostatic Pressure Test: A hydrostatic test shall be made to demonstrate that the sludge digester is gas tight. After a satisfactory test has been made, the digester drained, and maintenance and repair work completed, valves shall be returned to normal operating position, plugs shall be removed, and the sludge digester and appurtenances shall be left ready for use.
  - 3.2.4 Startup of Aerobic or Anaerobic Digester: After maintenance and repair work has been completed and approved, the Contractor shall return the sludge digester to service and operate it to design capacity.

**Tertiary Sand Filters**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of sewage treatment plant tertiary sand filters. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Filter Media:
    - 2.1.1 Sand: Silica sand shall be inert to wastewater and bacterial attack and shall have the following characteristics:
      - 2.1.1.1 Sphericity: Not less than 9.0.

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- 2.1.1.2 Porosity: Not more than 0.4.
- 2.1.1.3 Hardness: Not less than 7.0.
- 2.1.1.4 Specific Gravity: Not more than 2.65 or less than 2.6.
- 2.1.1.5 Inertness: Not less than 97 percent of the sand shall remain insoluble after 24 hours in hydrochloric acid.
- 2.1.2 Support gravel shall be hard, durable, clean, and uniformly spherical particles, free of mica and other thin and flat particles. Depths and sizes shall be as designated.
- 2.2 Underdrain System:
  - 2.2.1 Vitrified Clay Underdrain: ASTM C 159.
  - 2.2.2 Concrete Underdrain: ASTM C 654.
  - 2.2.3 Perforated Vitrified Clay Pipe and Fittings: ASTM C 700.
  - 2.2.4 Vitrified Clay Pipe and Fittings: ASTM C 301.
- 2.3 Filter Housing:
  - 2.3.1 Grout shall be metallic, nonshrink type.
  - 2.3.2 Concrete repair material shall be epoxy type complying with Applicable standards and/or.
  - 2.3.3 Concrete Coatings:
    - 2.3.3.1 Outside and above grade shall be epoxy type complying with Mil. Spec. MIL-P-24441.
    - 2.3.3.2 Inside and below grade shall be coal-tar epoxy type complying with SSPC-PAINT 16.
  - 2.3.4 Steel repair material shall be steel plate, to match existing, epoxy cement, or fiberglass cloth.
  - 2.3.5 Steel coatings shall be red-lead base coat complying with Fed. Spec. TT-P-86, Type I and finish coats of aluminum paint complying with Fed. Spec. TT-P-38.
- 2.4 Loss of head switch shall be of the same model or type, range, and contact rating as the loss of head switch to be replaced.
- 3.0 EXECUTION:
  - 3.1 Media Placement for Gravity and Pressure Filters:
    - 3.1.1 The filter box or tank and under drain shall be thoroughly cleaned before starting gravel and media placement. Materials becoming dirty shall be removed and replaced.
    - 3.1.2 The bottom gravel layer shall be placed carefully by hand to avoid movement to the underdrain system and to assure free passage for water from the orifices. Each layer shall be completed before the layer above is started. Gravel of differing gradations shall not be mixed. Gravel becoming mixed shall be removed and replaced. Gravel shall be cleaned as necessary by backwashing. For sizes less than 1/2 inch, the gravel shall be leveled to +/- 1/4 inch of the water surface defining its limit. For sizes greater than 1/2 inch, the gravel shall be leveled to +/- 1/2 inch of the water surface.
    - 3.1.3 Media shall be placed in a manner similar to the gravel placement and processed as may be required to achieve the gradation recommended by the manufacturer.
  - 3.2 Underdrain Repair:
    - 3.2.1 Underdrain blocks shall be arranged in rows without anchoring and with space maintained by lug. Opening shall be free and unobstructed to the passage of water.
    - 3.2.2 Perforated pipe shall be firmly supported with sand bedding.
    - 3.2.3 Open-spaced pipe shall be installed in compliance with ASTM C 12.
  - 3.3 Filter Housing Repair:
    - 3.3.1 Filter material shall be removed and inside walls cleaned prior to grouting or coating application.
    - 3.3.2 Welding shall be done in compliance with AWS D1.1.
  - 3.4 Cleaning and Coating:
    - 3.4.1 Interior concrete surfaces of the tank shall be cleaned with high pressure water, steam, or sandblasted to remove all dirt and residue.
    - 3.4.2 Holes and voids in the concrete surfaces left from the blast cleaning shall be filled with an epoxy filler. The surfacing material shall be allowed to cure overnight, and then two coats of Coal-tar epoxy shall be applied to a dry film thickness of 10 mils per coat.
    - 3.4.3 Submerged ferrous metal surfaces, such as piping, ladders, structural steel, equipment, and metal roof surfaces that are exposed to the sludge, shall be cleaned and coated with two coats of Coal-tar epoxy with dry film thickness of 10 mils per coat.
    - 3.4.4 Exterior concrete surfaces of the tank shall be cleaned and two coats of epoxy-polyamide paint shall be applied to a dry film thickness of 5 mils per coat.

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- 3.4.5 Ferrous metal surfaces that are not submerged shall be cleaned and coated with one coat of Red-lead base paint to a dry film thickness of 3 mils. After the base paint has dried sufficiently, two coats of Aluminum finish paint shall be applied to a dry film thickness of 2 mils per coat.
- 3.5 Manual scouring shall be done during backwash (bed expanding) cycle, using long tined rakes and high pressure hose streams directed at, and into, the expanded bed.
- 3.6 Chemical cleaning solution from the filter bed shall be discharged to the backwash return tanks.
- 3.7 Detergents and chemicals shall not be allowed in the maintenance of rapid sand filters. Purging of the underdrain system shall be with caustic detergents (2 to 5 percent caustic soda) or 50 parts per million chlorine solution in slow sand filters.
- 3.8 Defective wash nozzles shall be replaced in each filter.
- 3.9 Cleaning of Air or Water Wash Nozzles: Jet and cone shall be removed from each nozzle and punched clean with a wire or rod.
- 3.10 Distribution laterals shall be flushed for a few minutes by removing the nozzles at the end of laterals.
- 3.11 General Maintenance of Loss of Head Switch: Connecting tubing shall be purged with clean air or water. Contacts shall be burnished, as required.

**Food Service Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of food service equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Food service equipment shall comply with applicable NSF Standards. Gas-burning equipment shall be designed for operation with the type of gas designated and shall be approved by AGAL. Electrically operated equipment shall be in accordance with applicable standards of the UL Electrical Appliance and Utilization Equipment Directory and UL 197.
- 2.1 Equipment:
  - 2.1.1 Vertical Steam Cooker: Mil. Spec. MIL-C-2354.
  - 2.1.2 Commercial-Type Range: Gas, Fed. Spec. A-A-50064; electric, Fed. Spec. A-A-50035.
  - 2.1.3 Ice Cube Machine: Mil. Spec. MIL-I-11867.
  - 2.1.4 Rinser-Sanitizer: Mil. Spec. MIL-R-19038.
  - 2.1.5 Fry Pan: Gas, ASTM F 1047; electric, ASTM F 1047.
  - 2.1.6 Automatic Coffee Urn: Mil. Spec. MIL-U-43263.
  - 2.1.7 Steam Kettles: Electric, Mil. Spec. MIL-K- 43359; gas, Mil. Spec. MIL-K-43943.
  - 2.1.8 Food Service Cabinets, Warmer-Refrigerator, Roll-Through, Roll-In: Mil. Spec. MIL-C-43427.
  - 2.1.9 Convection Ovens: Gas, Fed. Spec. A-A-50042; electric, Fed. Spec. A-A-50039.
  - 2.1.10 Sanitizing Hot Water Heater: Mil. Spec. MIL-H-43895.
  - 2.1.11 High Pressure Cleaning and Sanitizing Machines: Mil. Spec. MIL-C-43949.
- 2.2 Materials:
  - 2.2.1 Black Iron Pipe: ASTM A 53.
  - 2.2.2 Brass Pipe: Fed. Spec. WW-P-351, Class 1.
  - 2.2.3 Chromium Plating of Brass Pipe, Valves, and Fittings: Fed. Spec. WW-P-541.
  - 2.2.4 Copper Tubing: ASTM B 88, Type K or L, or ASTM B 75, as required.
  - 2.2.5 Stainless Steel, Nonmagnetic: ASTM A 167 or ASTM A 240.
  - 2.2.6 Stainless Steel Pipe and Tubing: Seamless or welded, of true roundness, and of material specified for stainless steel. Seamless tubing shall be thoroughly annealed, pickled, and ground smooth. Welded tubing shall be thoroughly heat-treated, quenched to eliminate carbide precipitation, and then drawn true to size, roundness, and ground. Tubing shall be given a No. 3 or 4 finish when exposed to view.
  - 2.2.7 Fittings for Copper Tubing: Solder-joint type. Flared joint fittings may be used in specific applications when approved. Cast bronze solder joint fittings shall conform to ANSI B16.22. Wrought copper and wrought bronze solder joint fitting shall conform to ANSI B16.22. Cast bronze fittings for flared joints shall conform to ANSI B16.26.

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- 2.2.8 Fittings for Brass Pipe: Fed. Spec. WW-P-460, Class A or B, as required.
- 2.2.9 Galvanizing Repair Compound: Mil. Spec. MIL-P-21035.
- 2.2.10 Silver Solder: Fed. Spec. QQ-B-654, class as applicable.
- 2.2.11 Steel Structural Shapes for Framing: ASTM A 36. Sections shall be galvanized by the hot-dip process, conforming to ASTM A 123, coating designation G-90.
- 2.2.12 Tin-Lead Solder: Fed. Spec. QQ-S-571, composition Sn50.
- 2.3 Garbage Disposal Machine: A floor supported type with cast alloy body supported on adjustable tubular legs. The upper housing shall be removable. The disposal shall be provided with a stainless steel cone with a water swirl inlet. Throat shall have a neoprene silver trap.
  - 2.3.1 The disposal shall be provided with magnetic starter with overload and under voltage protection, 5-minute timer, panel cover interlock, fused disconnect, prewired solenoid, vacuum breaker, water flow controls, positive flushing action and reversing action, or other positive means of preventing jamming. The rotor shall be cast alloy carrying rigid impact bars fixed directly onto motor shaft, or stainless steel swivel impellers and stainless steel undercutter. Disposal machines with a 5 hp or 7-1/2 hp motor shall have a minimum 8-inch diameter rotor.
  - 2.3.2 Control: Control panel box shall be waterproof stainless steel construction.
- 2.4 Hoods: Design, fabrication, and installation of hoods and duct systems shall conform to NFPA 96 and UL 710 where applicable. Hood duct systems, grease removal devices, and cooking equipment, which may be a source of ignition of grease in the hood or duct, shall be protected with fixed pipe systems and provided with portable fire extinguishing equipment in accordance with NFPA 96, NFPA 17, and as specified. Ducts and hoods shall be secured to building so as to be level and free from vibration under all conditions of operations. Hoods, exposed ducts, and enclosures over dishwashing machines and rinse compartment of pot washing sinks shall be constructed of 18-gauge stainless steel. Hood shall be fabricated so as to form a condensate gutter at the perimeter and shall be provided with a condensate drain terminating at the floor sink location. Exhaust outlet shall be connected to the exhaust system.
- 2.5 Prefabricated Walk-In Refrigerators: Commercial, walk-in type, intended for use in dining facilities, in accordance with Mil. Spec. MIL-R-43900 except insulation shall provide a maximum "U" factor of 0.0295 Btuh.
- 2.6 Gas burning equipment shall comply with the applicable requirements of AGAL and ANSI. Each gas-burning appliance shall be connected to the building piping by means of a quick-disconnect device and flexible connector. A manual shutoff valve shall be installed on the building piping, ahead of the supply side of each quick-disconnect device. The quick-disconnect device shall conform to ANSI Z21.41 and the flexible connector to ANSI Z21.45. The length of the flexible connector shall be as required but shall not exceed 72 inches. Flexible connector shall not be concealed and shall not extend from one room to another. Dust caps and plugs shall be provided for quick-disconnect fittings for use when fittings are uncoupled.
- 2.7 Backflow Preventers: Each item of food service equipment having water supply and waste connections, with the water inlet connected below the flood level of the equipment, shall be supplied with backflow preventer of size and proportions that will allow an ample flow of water to the equipment, but will prevent the backflow of waste or polluted water into the water supply system.
- 2.8 Paint shall be of a durable, nontoxic, nondusting, nonflaking, and mildew-resistant type, suitable for use with food service equipment and in conformance with NSF 2.
- 3.0 EXECUTION:
  - 3.1 Installation: Equipment shall be installed in accordance with NSF Installation Manual for Food Service Equipment. The Contractor shall make provision for the plumbing, heating, and electrical connections and for equipment indicated as being furnished and installed by the Member. Equipment connections shall be complete to wall or floor for all utilities. Unless otherwise specified, exposed piping shall be chromium-plated copper alloy or stainless steel. Gas equipment installation shall conform to ANSI Z21.15 and NFPA 54. Electrical work shall comply with NFPA 70.
  - 3.2 Painting: All exterior, galvanized parts, exposed members of framework, and wrought steel pipe, where specified to be painted, shall be cleaned, degreased, primed with rust inhibiting primer, and finished with two coats of epoxy-based grey hammertone paint.

**Refrigerators**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of residential refrigerators. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Refrigerators and Freezers: AHAM HRF-1.
  - 2.2 Cords and Plugs: UL 62 and UL 817
  - 2.3 General Electrical: NFPA 70.
  - 2.4 Compressors: UL 984.
  - 2.5 Condensers: UL 250.
  - 2.6 Motors: UL 73.
- 3.0 EXECUTION: (Section not used.)

**Dishwashers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of residential dishwashers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Dishwashers: UL 749.
  - 2.2 Time Control: UL 917.
  - 2.3 Control Valves: UL 429.
  - 2.4 General Electrical: NFPA 70.
  - 2.5 Cords and Plugs: UL 62.
  - 2.6 Motors: UL 73 and UL 547.
  - 2.7 Safety-Interlock Switch: UL 749.
- 3.0 EXECUTION: (Section not used.)

**Garbage Disposers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of residential garbage disposers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Household Garbage Disposal: Fed. Spec. OO-G-1513 and AHAM FWD-1.
  - 2.2 Cords and Plugs: UL 62 and UL 817.
  - 2.3 Motors: UL 73.
  - 2.4 General Electrical: NFPA 70.
- 3.0 EXECUTION: (Section not used.)

**Ranges and Ovens**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of residential ranges and ovens. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Conduit: UL 1.
  - 2.2 Conductors: UL 62, UL 83, and UL 817.

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- 2.3 Switches: UL 20 and UL 917.
- 2.4 Fuses and Fuseholders: UL 198 and UL 512.
- 2.5 Connectors: UL 486.
- 2.6 Ranges: UL 858.
- 2.7 Thermal Cutoffs: UL 1020.
- 2.8 General Electrical: NFPA 70.
- 2.9 Pilot Lights: UL 496 and UL 542.
- 2.10 Range Hoods: Non-vented, two-speed fan, charcoal filter, light, UL listed.
- 3.0 EXECUTION: (Section not used.)

**Clothes Dryers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of residential clothes dryers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Cords and Plugs: UL 62 and UL 817.
  - 2.2 Thermal Cutoffs: UL 1020.
  - 2.3 General Electrical: NFPA 70.
  - 2.4 Motors: UL 73.
  - 2.5 Home Laundry Equipment: UL 560 and Fed. Spec. OO-W-860.
  - 2.6 Switches: UL 917 and UL 20.
  - 2.7 Lamps and Lamp Holders: UL 496 and UL 542.
  - 2.8 Vent Duct: Plastic wrapped, flexible wire duct of diameter to fit duct pipe of machine.
  - 2.9 Weather Hood: Aluminum construction with backdraft damper.
- 3.0 EXECUTION: (Section not used.)

**Clothes Washers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of residential clothes washers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Cords and Plugs: UL 62 and UL 817.
  - 2.2 Electrically-Operated Valves: UL 429.
  - 2.3 Home Laundry Equipment: UL 560 and Fed. Spec. OO-W-860.
  - 2.4 Lamps and Lamp Holders: UL 496 and UL 542.
  - 2.5 General Electrical: NFPA 70.
- 3.0 EXECUTION: (Section not used.)

**Unit Kitchens**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of unit kitchens. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Electrical components shall comply with applicable UL standards and bear appropriate UL labels. Gas-burning equipment shall comply with ANSI Z21.1 and shall bear the AGA seal of approval.
  - 2.1 Materials: Minimum 22-gauge steel sheet for component body parts, minimum 20-gauge steel sheet for door fronts and liners, and heavier-gauge steel for internal gussets and bracing.
  - 2.2 Components: Electrical components shall be wired for the voltage available and shall terminate at factory-installed terminal boxes. Gas-burning components shall be designed to operate on the

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designated fuel. Unit kitchens shall include the following, as required:

- 2.2.1 Top and sink shall be seamless, one-piece with integral back and end splashes fabricated from 18-gauge AISI Type 302/304 stainless steel with No. 4 brushed finish or 16-gauge minimum titanium steel with acid-resistant porcelain finish. Sink accessories shall include chrome-plated swing spout faucet with aerator, chrome-plated faucet handles, stainless steel cup strainer, and drain outlet with tailpiece.
- 2.2.2 Food Waste Disposer shall be complete with drain outlet and tailpiece.
- 2.2.3 Refrigerator and freezer compartments shall be the designated minimum capacity measured in accordance with AHAM HRF-1.
- 2.2.4 Range: Each cooktop burner shall be rated at not less than 1,250 watts, if electric, or 8,000 Btu, if gas.
- 2.2.5 Oven: Electric oven "Bake" operation shall be rated at 2,000 watts minimum and "Broil" operation shall be rated at 2,500 watts minimum; gas oven burners shall be rated at 18,000 Btu minimum.
- 2.2.6 Cabinets shall be under-counter and upper wall-mounted, with shelves, doors, drawers, and hardware.
- 3.0 EXECUTION: (Section not used.)

**Gymnasium Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of gymnasium equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Basketball backstops shall be ceiling-suspended forward-folding, backward-folding, side-folding, wall-braced or fixed type; wall-mounted up-folding, side-folding or fixed type; or floor-mounted portable type as required. Backstop shall come complete with backboard, goal, and all accessories. Backboard material shall be glass, fiberglass, steel or wood as required and rectangular or fan shaped. Movable backstops shall be manually or electrically operated. Backstops, goals, and their accessories shall meet the specifications of the National Collegiate Athletic Association.
  - 2.2 Gym divider curtains shall be constructed of vinyl for the first eight feet (8' 0") above the floor. The remainder shall be 1-3/4 inch mesh, white nylon netting. A chain or other ballast shall be sewn into the bottom hem. Curtains that are drawn shall be manually operated and glide along their own track. Roll-up curtains shall be power-operated.
- 3.0 EXECUTION:
  - 3.1 Basketball goals shall be securely attached to supporting construction and shall be installed at a height of 10 feet from the rim to the floor.
  - 3.2 Telescoping Bleacher Seating: Verify that areas to receive telescoping bleacher seating are free of impediments interfering with installation and operation. Securely attach to supporting construction.
  - 3.3 Gym Divider Curtains: Verify that areas to receive gym divider curtains are free from interferences and structurally capable of supporting the curtains.

**Paint Spray Booth**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of paint spray booths. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work. Contact the Fire Protection Engineering Branch for requirements of paint spray booth protection.
- 2.0 PRODUCTS: All products shall meet applicable OSHA and NFPA standards.
  - 2.1 Enclosure:
    - 2.1.1 Panels: 18 gauge, ASTM A 568.
    - 2.1.2 Stiffeners and Support Shapes: ASTM A 36.
    - 2.1.3 Exhaust Chamber: 18 gauge, formed to hold filters.

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- 2.1.4 Doors:
  - 2.1.4.1 Access Door: 2 feet 6 inches by 7 feet 0 inches, steel-clad.
  - 2.1.4.2 Entrance Doors for Vehicular Booths: Swing type, two-section, steel-framed with intake air filters, a minimum opening of 8 feet 9 inches in height by 9 feet 10 inches in width, leak-proof seals and a heavy-duty latch.
  - 2.1.4.3 Exit Doors for Vehicular Drive-Through Booths: Swing type, two-section, steel frame, metal-clad, solid, with a minimum opening of 7 feet 9 inches in height by 9 feet 10 inches in width, leak-proof seals, and a heavy-duty latch.
- 2.1.5 Factory Finish: Galvanized or painted.
- 2.2 Filtering Equipment:
  - 2.2.1 Arrestor: Disposable, expanded fiber or fiberglass, Class 2 listed by UL.
  - 2.2.2 Water Wash: Complete with pumps, spray nozzles, baffles, and controls.
- 2.3 Exhaust Fans shall be sized to maintain 100 fpm minimum across the cross sectional area of booth and shall have permanently lubricated bearings and enclosed belts. Fan motors shall be located outside of air stream.
- 2.4 Lighting: Fluorescent.
- 2.5 Fans, controls, and lights inside paint booths shall be explosion proof.
- 1.1 EXECUTION: Installation shall comply with applicable codes and environmental regulations.

### **DIVISION 12-FURNISHINGS** (NOT USED)

### **DIVISION 13-SPECIAL CONSTRUCTION**

#### **Pre-engineered Structures**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of pre-engineered metal buildings. Products shall match existing materials and/or shall be as directed by the Contracting Officer. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Metal buildings shall be the design and product of a recognized metal building manufacturer who is regularly engaged in the fabrication of pre-engineered structures.
  - 2.1 Design Requirements:
    - 2.1.1 Metal buildings shall be designed for the dead load, designated live loads, and combinations of these loads as set forth in the MBMA Low Rise Building Systems Manual.
    - 2.1.2 Framing and Structural Members: Structural steel members shall be designed in accordance with AISC publication, Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings. Structural cold-formed steel framing members shall be designed in accordance with the AISI publication, Specification for the Design of Cold-Formed Steel Structural Members. Framed openings shall be designed to structurally replace the covering and framing displaced. Welding of steel shall be in accordance with AWS D1.1.
    - 2.1.3 Exterior Covering: Maximum wind load deflection for wall sheets shall not exceed 1/180 of the span between supports: Maximum live load deflection for roof sheets shall not exceed 1/180 of the span between supports. Maximum deflections shall be based on sheets continuous across two or more supports with sheets unfastened and fully free to deflect.
  - 2.2 Materials:
    - 2.2.1 Hot-Rolled Structural Shapes: ASTM A 36 or A 529.
    - 2.2.2 Tubing or Pipe: ASTM A 500, Grade B; ASTM A 501; or ASTM A 53.
    - 2.2.3 Members Fabricated from Plate or Bar Stock: 42,000 psi minimum yield strength; ASTM A 529, A 570, or A 572.
    - 2.2.4 Members Fabricated by Cold Forming: ASTM A 607, Grade 50.
    - 2.2.5 Galvanized Steel Sheet: ASTM A 446 with G 90 coating.
  - 2.3 Framing:
    - 2.3.1 Rigid frames shall be hot-rolled structural steel; factory-welded and shop-painted built-up "I" shape or open web rigid frame consisting of tapered or parallel flange beams and tapered columns. Furnish complete with attachment plates, bearing plates, and splice members. Frames shall be

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- factory-drilled for bolted field assembly.
- 2.3.2 End wall columns shall be factory-welded, built-up "I" shape or cold-formed sections, fabricated of minimum 14-gauge material, and shop-painted.
  - 2.3.3 Wind Bracing shall be adjustable, threaded steel rods, 1/2 inch in diameter minimum; ASTM A 36 or A 572, Grade D.
  - 2.3.4 Secondary Framing: Purlins, eave struts, end wall beams, and flange and sag bracing shall be minimum 16-gauge rolled formed sections and shop-painted. Base channel, sill angle, end wall structural members (except columns and beams), and purlin spacers shall be minimum 14-gauge cold-formed steel, galvanized.
  - 2.3.5 Bolts shall be ASTM A 307 or A 325 as necessary for design loads and connection details. Bolts shall be shop-painted, except zinc- or cadmium-plated units shall be provided when in direct contact with panels.
  - 2.4 Roofing and Siding: Provide flashings, closers, fillers, metal expansion joints, ridge covers, fascias, and other sheet metal accessories, factory-formed of same material and finish as roofing and siding.
    - 2.4.1 Roof-covering assemblies shall have a wind uplift resistance rating of Class 90 in accordance with UL 580 and shall be listed in the UL Fire Resistance Directory for wind uplift resistance classification.
    - 2.4.2 Steel covering shall be zinc-coated steel conforming to ASTM A 446, Grade C, with G 90 coating complying with ASTM A 525. Steel sheets and panels shall be not less than 26-gauge.
    - 2.4.3 Aluminized steel sheets shall be aluminum-coated, ASTM A 463, Drawing Quality with T1-40 coating. Metal thickness shall be not less than 26-gauge.
    - 2.4.4 Aluminum sheets shall be fabricated from aluminum alloy 3003 or 3004 Alclad with tempering as required to suit forming operations, ASTM B 209. Aluminum sheet thickness shall be not less than 0.032 inch.
    - 2.4.5 Insulated wall panels shall be factory-assembled or field-assembled units, consisting of a central insulating core with metal interior and exterior face sheets securely fastened together with rivets, bolts, studs, "snap-on", or other approved methods of fastening, including interlocking with basic wall units.
  - 2.5 Insulation:
    - 2.5.1 Insulation shall be batts, blankets, and/or rigid material of required thickness and density to provide an overall tested heat transfer U-value as required. Insulation shall have a flame spread classification of 25 or less and a smoke developed rating not in excess of 50 when tested in accordance with ASTM E 84. Exposed insulation shall be faced with a vapor barrier of vinyl film, vinyl reinforced foil, or foil reinforced Kraft.
    - 2.5.2 Rigid or semi-rigid board insulation shall conform to Fed. Spec. HH-I-558, Form A, Class 1 or Class 2. Insulation shall have a white non-dusting and non-shedding painted finish.
    - 2.5.3 Blanket insulation shall conform to Fed. Spec. HH-I-558, Form B, Type I, Class 6. Insulation shall have a white sheet vinyl facing.
  - 2.6 Accessories:
    - 2.6.1 General: Provide coated steel accessories with coated steel roofing and siding; aluminum accessories with aluminum roofing and siding.
    - 2.6.2 Gutters shall be formed in sections, complete with end pieces, outlet tubes, and special pieces that may be required. Finish to match roof fascia and rake.
    - 2.6.3 Downspouts shall be formed in sections, complete with elbows and offsets, and shall be finished to match wall panels.
    - 2.6.4 Circular gravity roof ventilators shall be low-profile, ridge type ventilators, complete with base, bird screen, hood, flashing, closures, and fittings, finished to match roof panels.
    - 2.6.5 Continuous ridge ventilators shall be factory-engineered and fabricated units of continuous heat valve type.
    - 2.6.6 Wall Louvers: Provide units fabricated of not less than 18-gauge steel, finished to match wall panels. Provide bird screens of 1/2-inch x 1/2-inch galvanized steel mesh in rewirable frames on exterior face of louvers. Secure screens with clips to ensure ease of removal for cleaning and rewiring.

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- 2.7 Hollow metal doors and door frames shall comply with Recommended Specifications for Standard Steel Doors and Frames (SDI-100), Steel Door Institute.
  - 2.7.1 Materials: Hot-rolled, pickled, and oiled in compliance with ASTM A 569 and A 568; cold-rolled in compliance with ASTM A 366 and A 568.
  - 2.7.2 Hollow metal units to receive mortised and concealed finish hardware, including cutouts, reinforcing, drilling, and tapping, shall comply with ANSI A115. Locate finish hardware in compliance with BHMA Recommended Locations for Builder's Hardware.
  - 2.7.3 Hardware: Provide hardware for each door, as follows:
    - 2.7.3.1 Hinges: 1-1/2 pair, steel, template hinges, 4-1/2 inches x 4-1/2 inches.
    - 2.7.3.2 Lockset: Cylindrical, key in knob.
    - 2.7.3.3 Threshold: Extruded aluminum (exterior doors only).
    - 2.7.3.4 Weatherstripping: Sponge neoprene or extruded vinyl, enclosed in an aluminum housing. Bottom weatherstripping shall be an aluminum extrusion with vinyl sweep strip.
- 2.8 Overhead Doors:
  - 2.8.1 Overhead doors shall be industrial type of standard manufacture, fabricated of 24-gauge galvanized steel minimum or 0.032-inch thick aluminum. Accessories shall include galvanized steel track, torsion-spring mechanism, ball-bearing roller, cylinder lock, and weatherstripping. Doors shall be manually operated, except that doors over 144 square feet in area shall be chain hoist or electric motor operated.
  - 2.8.2 Overhead Coiling Doors:
    - 2.8.2.1 General: Provide operating door assemblies as a complete unit produced by one manufacturer, including door curtain, guides, counterbalance, hood, hardware, operators, and installation accessories.
    - 2.8.2.2 Door Curtain: Fabricate overhead coiling door curtain of interlocking slats designed to withstand required wind loading. Slats shall be structural quality, cold-rolled galvanized steel sheets complying with ASTM A 446, Grade A, with G90 zinc coating, complying with ASTM A 525, and phosphate treated before fabrication, or aluminum slats, 5052 alloy, standard mill finish, not less than 0.04 inch thick.
- 2.9 Windows: Windows shall be of steel in accordance with the Steel Window Institute, The Specifier's Guide to Steel Windows, or of aluminum in accordance with the AAMA 101. Windows shall be complete with operating and locking hardware and glazing.
- 2.10 Fabrication: Shop fabricate to the required size and section, complete with base plates, bearing plates, and other plates as required for erection, welded in place, and with all required holes for anchoring or connections shop drilled or punched to template dimensions. Shop connections shall be power riveted, bolted, or welded. Field connections shall be bolted.
- 2.11 Shop Painting:
  - 2.11.1 Clean surfaces to be primed of loose mill scale, rust, dirt, oil, grease, and other matter precluding paint bond. Follow procedures of SSPC-SP3 for power tool cleaning, SSPC-SP7 for brush-off blast cleaning, and SSPC-SP1 for solvent cleaning.
  - 2.11.2 Prime structural steel primary and secondary framing members with rust-inhibitive primer having over 50 percent rust-inhibitive pigment, such as red-lead mixed pigment alkyd varnish (Fed. Spec. TT-P-86, Type II) or zinc chromate iron-oxide alkyd (Fed. Spec. TT-P-664).
  - 2.11.3 Prime galvanized members, after phosphoric acid pretreatment, with zinc dust-zinc oxide primer (Fed. Spec. TT-P-641).
- 3.0 EXECUTION: Erection shall be in accordance with the approved erection instructions. Dissimilar materials that are not compatible when contacting each other shall be insulated from each other by means of gaskets or insulating compounds. Exposed surfaces shall be kept clean and free from sealant, metal cuttings, and other foreign materials.
- 3.1 Framing: Erect structural framing true to line, level, plumb, rigid, and secure. Provide rake or gable purlins with tight-fitting closure channels and fascias. Provide diagonal rod or angle bracing in both roof and sidewalls as required. At framed openings provide shapes of proper design and size to reinforce opening and to carry loads and vibrations imposed, including equipment furnished under mechanical or electrical work. Securely attach to building structural frame.
- 3.2 Roofing and Siding: Arrange and nest sidelap joints so that prevailing winds blow over, not into,

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- lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line. Protect factory finishes from damage. Provide weather seal under ridge cap; flash and seal roof panels at eave and rake with rubber, neoprene, or other closures to exclude weather.
- 3.2.1 Roof Sheets: Provide sealant tape at lapped joints of ribbed or fluted roof sheets and between roof sheeting and protruding equipment, vents, and accessories.
  - 3.2.2 Wall Sheets: Apply elastomeric sealant continuous between metal base channel (sill angle) and concrete and elsewhere as necessary for waterproofing. Align bottoms of wall panels and fasten panels with blind rivets, bolts, or self-tapping screws.
  - 3.3 Sheet Metal Accessories: Install gutters, downspouts, ventilators, louvers, and other sheet metal accessories, for positive anchorage to building and weathertight mounting.
  - 3.4 Swing Doors and Frames: Install doors and frames straight, plumb, and level.
  - 3.5 Overhead Doors: Set doors and operating equipment complete with necessary hardware, jamb and head mold stops, anchors, inserts, hangers, and equipment supports. Adjust moving hardware for proper operation.
  - 3.6 Windows: Anchor windows securely in place. Seal entire perimeter of each unit with elastomeric sealant used for panels. Adjust and lubricate operating sash (vents) and hardware for proper operation. Clean surfaces of window units. Mount screens directly to frames with tapped screw clips.
  - 3.7 Glazing: Clean channel surfaces and prime as recommended by sealant manufacturer. Cut glass to required size for measured opening; provide adequate edge clearance and glass bite all around. Install setting blocks at quarter points, set in a bed of sealant if heel-bead is used. Install spacers inside and out, all around, wherever liquid or plastic mastic compounds are used.
  - 3.8 Thermal Insulation: Install blankets straight and true in one-piece lengths and both sets of tabs sealed to provide a complete vapor barrier.
  - 3.9 Field Painting: Apply finish coating to factory-primed items.

**Swimming Pool Accessories**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of swimming pool equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Diving stands shall be fabricated of 1-1/2 inch Schedule 40 stainless steel pipe. Their use shall be directed by facility dimensional requirements and shall comply with APHA, USS, NCAA, AAU, and FINA.
  - 2.2 Diving boards shall be fabricated of all aluminum or of laminated wood and fiberglass. All upper surfaces shall be non-skid, and all edges shall be rounded and sealed.
  - 2.3 Ladders shall be fabricated from low carbon Type 304 stainless steel and have raised non-skid treads. Quantities, locations, and clearances shall comply with National Spa and Pool Institute standards.
  - 2.4 Lifeguard chairs shall be fabricated from Type 304 stainless steel (framework and handrails) and have raised non-skid treads and non-skid platforms. Units shall comply with Safety Requirements, published by the National Swimming Pool Institute, and OSHA standards.
  - 2.5 Underwater lights of not less than 0.5 watts per square foot of pool area shall be provided in accordance with Lighting and Wiring, published by the National Spa and Pool Institute, and Article No. 68D of the National Electrical Code.
  - 2.6 Pool covers shall be polyethylene, having a flame spread rating of "0" as per ASTM E 84. Materials shall be non-toxic, non-absorbent, non-permeable, chemical-resistant and have a upper service limit of 110 F. Storage reels shall be constructed of Type 304 stainless steel.
  - 2.7 Slides shall consist of fiberglass bodies with integral continuous flowing water supply, Type 304 stainless steel frames and raised non-skid ladder treads.
- 3.0 EXECUTION: (Section not used.)

**Sludge Incinerators**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for the repair and maintenance of sewage treatment plant incinerators. Products shall match existing materials and/or as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Refractory materials shall comply with ASTM C 27.
  - 2.2 Sand for fluidized bed shall be high silica sand having an effective size of 0.20 mm. and a uniformity coefficient of 1.8.
  - 2.3 Repair and replacement parts for burners shall be compatible with the existing burners.
- 3.0 EXECUTION:
  - 3.1 Cleaning, Lubrication, and Adjustments: Thoroughly clean fan, blower, motor, and damper of dirt, dust, and other foreign material. Parts shall be lubricated and adjusted for proper operation.
  - 3.2 Burner Parts shall be cleaned and primary and secondary air openings shall be adjusted as required for good combustion and to meet the design requirements for excess air to the burner. Adjustments shall be made with the incinerator in normal operation.
  - 3.3 Cleaning of Fuel and Atomizing Lines: Gas, oil, air, and steam lines connected to the burner shall be disconnected, cleaned, and reconnected.
  - 3.4 Startup: After completion of maintenance and repairs, the incinerator shall be started up and operating adjustments shall be made by the Contractor as required to achieve the design flow rate and emission quality of the incinerator.

**Settling Chamber**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of water treatment plant settling chambers and weirs. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: (Section not used.)
- 3.0 EXECUTION:
  - 3.1 Interruptions of Treatment: Not more than one settling chamber shall be taken out of service at a time.
  - 3.2 Installation:
    - 3.2.1 Painting: Exposed new surfaces and surfaces marred during the work shall be painted to match existing color.
    - 3.2.2 Startup: Final adjustments and startup shall be made in such a way as to ensure that all equipment operates at design conditions and rated capacity.
    - 3.2.3 Weir Adjustment: Adjust existing weirs that have a top edge elevation variation of more than 1/32 inch, and all new weirs, to be level throughout their length at the elevation specified.
    - 3.2.4 Weir Repair: Grind metal weir plates smooth and even, if grinding does not exceed amount of available equipment.

**Water Treatment Plant Filters**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of gravity and pressure filters for water treatment plants. Products shall match exiting materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Concrete repair materials shall be epoxy type grout in compliance with Applicable standards and/or.
  - 2.2 Steel plate, welding rods and welding electrodes shall be of a composition that complies with Section II of ASME Boiler and Pressure Vessel Code.

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- 2.3 Sequencing controls and solenoid valves shall comply with NEMA ICS and UL 508.
- 2.4 Filter media shall comply with the requirements of AWWA B100 and shall be equivalent to the existing filter materials.
- 2.5 Replacement weirs and troughs may be steel, conforming to ASTM A 36, or glass fiber reinforced plastic, in compliance with ASTM D 3841.
- 3.0 EXECUTION:
- 3.1 Tank and Trough Repair: Welding repairs shall comply with Paragraph UF-37 of Section VIII of the ASME Boiler and Pressure Vessel Code or AWS D1.1.
- 3.2 Weirs: Adjust weirs to the elevation required. Weirs may not have a top edge elevation variation of more than 1/32 inch throughout their length. Eroded top edges of metal weir plates shall be ground smooth and even, if grinding does not exceed amount of available adjustment.
- 3.3 Filter Media: Filtering materials shall be replaced in accordance with AWWA B100.
- 3.4 Testing: Test leak repairs by hydrostatic pressure or by pneumatic pressure if the leak is in the tank air space. Test sequence controls, solenoid valves, and backwash equipment to ensure that they operate at design conditions.
- 3.5 Cleaning: Clean tank interior of all sediment and foreign matter after completion of repair and testing. Clean sequence controls and associated electrical contacts.
- 3.6 Painting: Exposed metal surfaces shall be painted.
- 3.7 Disinfection: Disinfect piping and filters in accordance with AWWA B100.

**Pressure Filters**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for the repair and maintenance of pressure filters for water treatment plants. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Steel plate, welding rods and welding electrodes shall be of a composition that complies with Section II of ASME Boiler and Pressure Vessel Code.
- 2.2 Relief valves shall be set to relieve at 15 psi above the normal operating pressure of the tank.
- 3.0 EXECUTION:
- 3.1 General: Welding repairs shall comply with Paragraph UF-37 of Section VIII of the ASME Boiler and Pressure Vessel Code or AWS D1.1.
- 3.2 Repair of Pin Holes: Weld holes of diameter less than half the plate thickness in compliance with AWS D1.1.
- 3.3 Repair of Cracks: Patch cracks or holes larger than one half the thickness of the tank shell plate.
- 3.4 Testing: Test leak repairs by hydrostatic pressure or by pneumatic pressure if the leak is in the air space of the tank.
- 3.5 Cleaning: Clean tank interior of all sediment and foreign matter after completion of repair and testing.

**Backwash Tanks**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance for water treatment plant backwash tanks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Bolts and Screws: Existing bolts and screws removed due to repair work shall be replaced with new bolts or screws complying with ASTM A 193, Grade B8 and nuts complying with ASTM A 194, Class 8F of the same type, size, and finish.
- 2.2 Finishes: Items replacing existing items that are galvanized, plated, painted, or otherwise finished shall be of like finish.
- 2.3 Steel tank repair parts shall be as specified in ASTM A 36, A 131, A 283, or A 573, depending upon

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required thickness.

- 2.4 Steel tank coatings shall be as specified in AWWA D102.
- 2.5 Concrete tank repair material shall be epoxy type grout in compliance with Applicable standards and/or.
- 2.6 Concrete tank coatings shall be a taste-free and odor-free, coal-tar base coating.
- 3.0 EXECUTION:
- 3.1 Preparation: Temporary backwash tank and accessories shall be furnished and installed as required to provide uninterrupted service.
- 3.2 Installation:
  - 3.2.1 Flame Cutting: No cutting by torch or flame shall be done without written authorization from the Authorized Member Representative.
  - 3.2.2 Testing: Test tanks by filling with water and inspecting for leaks. Test piping and valves hydrostatically at one and one half times normal working pressure or 50 psig, whichever is greater.

**Sewage Treatment Plant Electrical Controls and Instrumentation**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of sewage treatment plant instrumentation. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Applicable Data: Flow diagrams, loop diagrams, and installation drawings of the existing instruments and sampling systems for which maintenance and repair is to be provided should be requested from the Authorized Member Representative.
  - 2.2 Instrumentation: All instrumentation shall be in accordance with the manufacturer's instructions.
- 3.0 EXECUTION:
  - 3.1 Scheduling and Coordination: Contractor shall determine that arrangements have been made to take the equipment out of service for the duration of the work.
  - 3.2 General: Perform listed maintenance procedures and repairs on meter and sampling system in compliance with the manufacturer's recommendations.
  - 3.3 Calibration: Calibrate meter over the meter's range and adjust to read correctly.

**Water Treatment Plant Electrical Controls and Instrumentation**

- 1.0 Water treatment plant electrical controls and instrumentation. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 General: Items not specified but required for the proper installation or repair of a specified item of work shall be provided. Items shall be of proper type, size, design, and characteristics for the use intended. Parts shall be factory-made.
  - 2.2 Finishes: Items replacing existing items that are galvanized, plated, painted, or otherwise finished shall be finished with like finish in compliance with the manufacturer's standard practice.
  - 2.3 Electrical controls and instrumentation components for replacement purposes shall be designed for same service as the existing.
- 3.0 EXECUTION:
  - 3.1 Coordination: Contractor shall determine that requirements for removal of the equipment from service, the bypassing of control valves, and installing of temporary replacements have been coordinated with the Authorized Member Representative. Bypassing of control valves or putting a control instrument in the Remote-Hand-Control mode will be done by the plant operators.
  - 3.2 Power Supplies that may be a hazard during the performance of the work shall be locked out.
  - 3.3 Testing: Check the operation of each instrument after it is returned to service. Adjust each instrument to operate properly over the design range.

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**Flow Measurement Devices**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of current type, turbine type, compound type, and fire service type meters for the measurement of flow. Products shall match existing materials and/or shall be as directed by Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Current type meters in sizes ranging between 5/8 inch and 6 inches shall conform to AWWA C 700.
  - 2.2 Turbine type meter for customer services in sizes ranging between 1-1/2 inches and 12 inches shall conform to AWWA C 701.
  - 2.3 Compound type meters in sizes ranging between 2 inches and 10 inches shall conform to AWWA C 702.
  - 2.4 Fire service type meters in sizes ranging between 3 inches and 10 inches shall conform to AWWA C 703.
  - 2.5 Current type meters, propeller-driven in sizes ranging between 2 inches and 36 inches shall conform to AWWA C 704.
  - 2.6 Multi-Jet Type Meters in sizes ranging between 5/8 inch and 2 inches shall conform to AWWA C 708.
- 3.0 EXECUTION: Calibration shall result in the flow measurement device reading correctly over its normal operating range.

**Solar Water Heating Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of solar water heating equipment. The solar energy system shall be arranged for preheating of service (domestic and/or process) water using flat plate liquid solar collectors. System components shall include a solar collector array, storage tank, pump[s], automatic controls, instrumentation, interconnecting piping and fittings, uninhibited food-grade propylene-glycol and water heat transfer fluid in a closed loop, potable water heat transfer fluid in an open loop, heat exchanger (for closed-loop), expansion tank (for closed-loop), and accessories required for proper operation of the system.
- 2.0 PRODUCTS:
  - 2.1 General Equipment Requirements:
    - 2.1.1 Standard Products: Materials and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of such products and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. Equipment shall be supported by a service organization that is, in the opinion of the Authorized Member Representative, reasonably convenient to the site.
    - 2.1.2 Special Tools: One set of special tools, calibration devices, and instruments required for operation, calibration, and maintenance of the equipment shall be provided.
  - 2.2 Piping System: Piping system shall be complete with pipe, pipe fittings, valves, strainers, expansion loops, hangers, inserts, supports, anchors, guides, sleeves, and accessories.
  - 2.3 Electrical Work: Electric motor-driven equipment specified shall be provided complete with motor, motor starters, and controls. Electrical characteristics shall be as specified or indicated. Motor starters shall be provided complete with thermal overload protection and other appurtenances necessary for the motor control specified. Each motor shall be of sufficient size to drive the equipment at the specified capacity without exceeding the nameplate rating of the motor. Manual or automatic control and protective or signal devices required for the operation specified, and any control wiring required for controls and devices, but not shown, shall be provided.
  - 2.4 Collector Subsystem: Collectors shall be of the flat plate, liquid, internally manifolded type. Each collector shall be provided with cover glazing, an absorber plate, heat transfer liquid flow tubes, internal headers, weep holes, insulation, and a casing. Collectors shall be of weather-tight construction. Solar collectors shall withstand a stagnation temperature of 350 degrees F and a working pressure of 125 psig without degrading, out-gassing, or warping. Collector net aperture area shall be a minimum of 28 square feet. Collector length, width, and volume shall be as shown.
    - 2.4.1 Collector Warranty: Contractor shall provide a minimum 10-year warranty against the following:

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failure of manifold or riser tubing, joints or fittings; degradation of absorber plate selective surface; rusting or discoloration of collector hardware; and embrittlement of header manifold seals. The warranty shall include full repair or replacement of defective materials or equipment.

- 2.4.2 Solar Collector Performance: Thermal performance shall be plotted on the thermal efficiency curve in accordance with ASHRAE 93. The y-intercept shall be equal to or greater than 0.68, and the numerical value of the slope of the curve (FRUL) shall be between 0 and minus 5.7 watts per square meter per degree K (0 and minus 1.0 Btu per hour per square foot per degree F). Manufacturer's recommended volumetric flow rate and the design pressure drop at the recommended flow rate shall be as shown. Manufacturer's recommendations shall allow at least seven collectors to be joined per bank while providing for balanced flow and for thermal expansion considerations.
- 2.5 Solar Collector Array:
- 2.5.1 Net Absorber Area and Array Layout: Array shall consist of an assembly of solar collectors as shown. Solar collectors shall be assembled as shown in banks of equal number of collectors. Banks shall consist of no less than 4 and no more than 7 collectors each. Collector array shall be oriented so that all collectors face the same direction and are oriented within 20 degrees of true south and with respect to true south as indicated. Collectors arranged in multiple rows shall be spaced so that no shading from other collectors is evident between 1000 hours and 1400 hours solar time on December 21. Minimum spacing between rows shall be as shown.
- 2.5.2 Piping: The array piping shall include interconnecting piping between solar collectors, and shall be connected in a reverse-return configuration as indicated with approximately equal pipe length for any possible flow path. Flow rate through the collector array shall be as indicated. Automatic pressure relief valves shall be provided in the array piping system as indicated, and shall be adjusted to open when the pressure within the solar array rises above 125 psig. Each collector bank shall be capable of being isolated by valves, and each bank capable of being separated shall have a pressure relief valve installed and shall be capable of being drained. Manually operated air vents shall be located at system high points, and all array piping shall be pitched a minimum of 0.25 inch per foot as shown so that piping can be drained by gravity. Calibrated balancing valves shall be supplied at the outlet of each collector bank as indicated.
- 2.5.3 Supports for Solar Collector Array: Support structure for collector array shall be aluminum and shall secure collector array at the tilt angle with respect to horizontal and orientation with respect to true south as shown. Support structure shall withstand static weight of filled collectors and piping, wind, snow, seismic, and other loads as indicated. Support structure shall allow access to all equipment for maintenance, repair, and replacement.
- 2.6 Storage Tank: Solar system hot water storage tank shall have a storage volume between 1.5 to 2 gallons per square foot of collector area and shall be as shown. Solar system storage tank shall conform to specifications for hot water storage tanks in Section 15401 INTERIOR PLUMBING. Insulation shall have an R value of not less than 30. Tank penetrations shall be designed to allow for connections to copper piping without risk of corrosion due to dissimilar metals, and shall be factory installed as indicated.
- 2.7 Transport Subsystem:
- 2.7.1 Heat Exchanger: The heat exchanger construction and testing shall be in accordance with ASME BPV VIII Div 1. Minimum design pressure rating shall be 125 psig. Heat exchanger shall be capable of returning a hot-side exit temperature of 120 degrees F or less given a hot-side approach temperature of 140 degrees F and a cold-side approach temperature of 100 degrees F. Heat exchanger shall be capable of withstanding temperatures of at least 240 degrees F. Heat exchanger shall be capable of operation at the flow rates as shown.
- 2.7.1.1 Plate Heat Exchanger: Heat exchanger shall be constructed of multiple plates of 316 stainless steel, titanium, copper, copper-nickel, or brass. Plates shall be frame-mounted, mechanically bonded, welded, or brazed at edges. Plate-type heat exchanger shall be able to be cleaned. Gaskets shall be of EPDM rubber or Viton. All plate heat exchanger characteristics shall be as indicated.
- 2.7.1.2 Tube-in-Shell Heat Exchanger: Heat exchanger shall be [fixed] [removable] bundle, shell-and-tube type. Shell, tube sheets, and end plates shall be constructed of nonferrous, brass, copper-

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- nickel, or 316 stainless steel. Shell insulation shall have a minimum R value of not less than 12. Tubes shall be seamless copper or copper alloy and shall be mechanically bonded, welded, or brazed to the end tube plates. Tubes shall be straight and supported by tube sheets that maintain the tubes in alignment. Straight tube heat exchanger shall be arranged for mechanical cleaning. All tube-in-shell heat exchanger characteristics shall be as indicated.
- 2.7.2 Pumps: Circulating pumps shall be electrically-driven, single stage, centrifugal type. The pumps shall be supported on a concrete foundation or by the piping on which installed. The pumps shall have a capacity not less than that indicated and shall be either integrally-mounted with the motor or direct-connected by a flexible-shaft coupling on a cast-iron or steel subbase. The pump shaft shall be constructed of corrosion resistant alloy steel, sleeve bearings and glands of bronze designed to accommodate a mechanical seal. Pumps shall have stainless steel impellers and casings of bronze. The motors shall have sufficient power for the service required, shall be of a type approved by the manufacturer of the pump, shall be suitable for the available electric service and for the heat transfer fluid used. The motors shall be controlled by suitable switches that can be activated by either the differential temperature controller or by manual override (Hand-Off-Automatic). Each pump suction and discharge connection shall be provided with a pressure gauge as specified.
- 2.7.3 Pipe Insulation: Array piping insulation shall be capable of withstanding 250 degrees F, except that piping within 1.5 feet of collector connections shall be capable of withstanding 400 degrees F.
- 2.7.4 Expansion Tank: Expansion tank shall be constructed and tested in accordance with ASME BPV VIII Div 1 and as applicable for a working pressure of 125 psig. Tank shall be provided with an elastomeric EPDM bladder which separates the system fluid from the tank walls and is suitable for a maximum operating temperature of 240 degrees F. Expansion tank acceptance volume shall be as a minimum the amount of fluid equal to the fluid volume of the collectors plus piping at the same height or above the collectors. Total tank size and arrangement shall be as shown. Tank shall be provided with 125 psi pressure relief valve. Tank shall be provided with precharge pressure as shown.
- 2.7.5 Heat Transfer Fluid: Solar collector loop fluid shall be uninhibited USP/food-grade propylene-glycol and shall be mixed with distilled or demineralized water to form a 30 or 50 percent by volume propylene-glycol solution with climates that commonly attain freezing temperatures (those above 4000 heating degree F days) receiving the 50 percent solution.
- 2.8 Control and Instrumentation Subsystem:
- 2.8.1 Differential Temperature Control Equipment: Differential temperature control equipment shall be supplied as a system by a single manufacturer. Controller shall be solid-state electronic type complete with an integral transformer to supply low voltage, shall allow a minimum adjustable temperature differential (on) of 8 to 20 degrees F, a minimum adjustable temperature differential (off) of 3 to 5 degrees F, and shall include a switching relay or solid state output device for pump control. Thermostat shall operate in the on-off mode. Controller accuracy shall be plus or minus 1 degree F. Controller shall be compatible with 10-kOhm thermistor temperature sensors. Differential control shall provide direct digital temperature readings of all temperatures sensed. Control shall indicate visually when pumps are energized. Control ambient operating range shall be a minimum of 32 to 120 degrees F.
- 2.8.2 Sensor and Control Wiring: 18 AWG minimum twisted and shielded 2, 3, or 4 conductor to match analog function hardware. Control wiring shall have 600 volt insulation. Multiconductor wire shall have an outer jacket of PVC.
- 2.8.3 Flowmeters: Flowmeters shall consist of a venturi, 6 inch dial differential pressure meter, valved pressure taps, and bar stock needle valves. Venturi flow nozzle shall have threaded bronze ends for pipe sizes up to 2 inches and flanged ends for pipe sizes 2-1/2 inches and above. Venturi length shall not be less than 1.6 times the pipe size. Venturi shall be selected to read differential pressure corresponding to 0.5 to 1.5 times the system flow rate. Venturi shall have an accuracy of plus or minus 1 percent of the range. Meter shall have an accuracy of plus or minus 2 percent of the full scale range.
- 2.8.4 Sight Flow Indicators: Sight flow indicators shall consist of a clear glass window or cylinder and a nonferrous or 316 stainless steel body and impeller. Indicator shall have threaded ends for pipe

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sizes up to 2 inches and flanged ends for pipe sizes 2-1/2 inches and above. Maximum operating pressure shall be no less than 125 psi. Maximum operating temperature shall be no less than 250 degrees F.

2.9 Painting and Finishing: Equipment and component items, when fabricated from ferrous metal and located inside the building, shall be factory finished with the manufacturer's standard finish.

3.0 EXECUTION:

3.1 Installation:

3.1.1 Collector Subsystem:

3.1.1.1 Collector Array: Solar collector array shall be installed at the tilt angle, orientation, and elevation above roof as indicated. For installation on flat roofs with rack type collector mounting or for ground mounted collectors, bottom of collector shall be a minimum of 18 inches from roof or ground surface. For mounting on pitched roofs, back of collectors shall be installed a minimum of 2 inches above roof surface. Each solar collector shall be removable for maintenance, repair, or replacement. Solar collector array shall not impose additional loads on the structure beyond the loads scheduled on the structural drawings.

3.1.1.2 Array Piping: Collector array piping shall be installed in a reverse-return configuration so that path lengths of collector supply and return are of approximately equal length.

3.1.1.3 Array Support: Array support shall be installed in accordance with the recommendations of the collector manufacturer. Structural members requiring welding shall be welded in accordance with AWS D1.2 for aluminum and welders should be qualified according to AWS B2.1.

3.1.2 Storage Subsystem: Solar storage tank penetrations shall be installed as shown so that cold water inlet to storage tank and outlet from storage tank to collector array are located near the bottom of the tank, and inlet from collector array and outlet to load are located near the top of the tank.

3.1.3 Transport Subsystem:

3.1.3.1 Flow Rates: Flow rate in the collector loop shall be based on recommended collector flow rate, and shall be as shown. Storage loop flow rate shall be 1.25 times the collector loop flow rate. System flow rate shall be based on recommended collector flow rate, and shall be as indicated. All flow rates shall be below 5 feet per second.

3.1.3.2 Pumps: Pumps shall be installed on foundations, leveled, grouted, and realigned before operation in accordance with manufacturers instructions. Additional pipe supports shall be provided for close-coupled in-line pumps. All base mounted pumps shall have a straight pipe between the suction side of the pump and the first elbow. The length of this pipe shall be a minimum of five times the diameter of the pipe on the suction side of the pump, or a suction diffuser of the proper size shall be attached to the suction side of the pump. All in-line pumps shall have straight pipe between the suction side of the pump and the first elbow. The length of this pipe shall be a minimum of five times the diameter of the pipe size on the suction side of the pump. Drain line sizes from the pumps shall not be less than the drain trap or the pump dirt pocket, but in no case shall the drain line be less than 1/2 inch iron pipe size. Drain lines shall terminate to spill over the nearest floor or open sight drain.

3.1.3.3 Expansion Tank: Expansion tank shall be installed on suction side of pump as shown.

3.1.3.4 Piping, Valves, and Accessories: Piping shall be coded with fluid type and flow direction labels. When a food-grade uninhibited propylene-glycol solution is used to heat potable service water, tamper resistant seals must be attached to all fill ports. All propylene-glycol circuits must be labeled "CONTAINS UNINHIBITED FOOD-GRADE PROPYLENE-GLYCOL: INTRODUCTION OF ANY NONAPPROVED FLUID MAY CONSTITUTE A HEALTH HAZARD." All tamper resistant seals must carry the name of the registered engineer or licensed plumber who certifies that only a 30 or 50 percent food-grade uninhibited propylene-glycol and water solution has been installed in the system. Air vents shall be installed at the high points of the collector array and in the equipment room.

3.1.3.5 Pipe Expansion: Expansion of supply and return pipes shall be provided for by changes in the direction of the run of pipe or by expansion loops as indicated. Expansion loops shall provide adequate expansion of the main straight runs of the system within the stress limits specified in ASME B31.1. Loops shall be cold-sprung and installed where indicated. Pipe guides shall be provided as indicated. Expansion joints shall not be used in system piping.

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- 3.1.3.6 Valves: Valves shall be installed at the locations indicated and where required for the proper functioning of the system. Valves shall be installed with their stems horizontal or above. Gate or ball valves shall be installed at the inlet and outlet of each bank of internally manifolded collectors. Calibrated balancing valves with integral pressure taps shall be installed at the outlet of each bank and at the pump discharge. Final setting for each valve shall be marked on each valve. Ball valves shall be installed with a union immediately adjacent. Gate valves shall be installed at the inlet and outlet of each pump and also at the inlet and outlet of each heat exchanger. A check valve shall be installed at pump discharges. Discharges of relief valves shall be piped to the nearest floor drain or as indicated on system drawings.
- 3.1.3.7 Foundations: Concrete foundations or pads for storage tanks, Heat exchangers, pumps, and other equipment covered by this specification shall be constructed in accordance with manufacturer's recommendations and be a minimum of 6 inches high with chamfered edges.
- 3.1.4 Control Subsystem:
  - 3.1.4.1 Differential Temperature Controller: Automatic control equipment shall be installed at the location shown in accordance with the manufacturer's instructions. Control wiring and sensor wiring shall be installed in conduit. Unless otherwise indicated, operators, controllers, sensors, indicators, and like devices when installed on equipment casings and pipe lines shall be provided with stand-off mounting brackets, bases, nipples, adapters, or extended tubes to provide clearance, not less than the thickness of the insulation, between the surface and the device. These stand-off mounting items shall be integral with the devices or standard accessories of the controls manufacturer unless otherwise approved. Clamp-on devices or instruments where direct contact with pipe surface is required shall be exempted from the use of the above mounting items. All control wiring shall be color coded and identified with permanent numeric or alphabetic codes.
- 3.2 Inspection and Testing:
  - 3.2.1 Inspection: Contractor shall make system available for inspection at all times.
  - 3.2.2 Testing Prior to Concealment:
    - 3.2.2.1 Hydrostatic Test: Contractor shall demonstrate to Authorized Member Representative that all piping has been hydrostatically tested, at a pressure of 125 pounds per square inch for a period of time sufficient for inspection of every joint in the system and in no case less than 2 hours, prior to installation of insulation. Expansion tank and relief valves shall be isolated from test pressure. No loss of pressure shall be allowed. Leaks found during tests shall be repaired by replacing pipe or fittings. Caulking of joints shall not be permitted.
    - 3.2.2.2 Cleaning of Piping: System piping shall be flushed with clean, fresh water prior to concealment of any individual section and prior to final operating tests. Prior to flushing piping, relief valves shall be isolated or removed. Solar collectors shall be covered to prevent heating of cleaning fluid, unless cleaning is performed during hours of darkness. The solution shall be circulated through the section to be cleaned at the design flow rate for a minimum of 2 hours.
  - 3.2.3 Posting Framed Instructions: Framed instructions under glass or in laminated plastic shall be posted where directed. These instructions shall include a system schematic, and wiring and control diagrams showing the complete layout of the entire system. Condensed operating instructions explaining preventative maintenance procedures, balanced flow rates, methods of checking the system for normal safe operation, and procedures for safely starting and stopping the system shall be prepared in typed form, framed as specified above, and posted beside the diagrams. Proposed diagrams, instructions, and other sheets shall be submitted for approval prior to posting. The framed instructions shall be posted before acceptance testing of the system.
  - 3.2.4 Acceptance Testing and Final Inspection: Contractor shall notify the Authorized Member Representative 7 calendar days before the performance and acceptance tests are to be conducted. Tests shall be performed in the presence of the Authorized Member Representative. Contractor shall furnish all instruments and personnel required for the tests. Electricity and water shall be furnished by the Member. A written record of the results of all acceptance tests shall be maintained, to be submitted in booklet form. The tests shall be as follows:
    - 3.2.4.1 As-Built Drawings: The Contractor shall provide as a condition of final acceptance a complete set of as-built system drawings. Drawings shall clearly indicate the actual condition of the installed solar energy system at the time of the final test.

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- 3.2.4.2 Final Hydrostatic Test: Contractor shall demonstrate to Authorized Member Representative that all plumbing has been hydrostatically tested at a pressure of 125 pounds per square inch for a period of time sufficient for inspection of every joint in the system and in no case less than 2 hours. Expansion tank and relief valves shall be isolated from test pressure. Gauges used in the test shall have been calibrated within the 6-month period preceding the test. Test shall be witnessed by Authorized Member Representative. No loss of pressure shall be allowed. Leaks found during tests shall be repaired by replacing pipe or fittings and the system retested. Caulking of joints shall not be permitted.
- 3.2.4.3 System Flushing: For the final inspection, the system shall be thoroughly flushed of all foreign matter until a white linen bag installed in a strainer basket shows no evidence of contamination and in no case for less than 2 hours. Authorized Member Representative shall inspect the linen bag prior to completion of flushing. System shall be drained prior to final filling.
- 3.2.4.4 System Filling: System shall be filled through indicated connections with propylene-glycol solution. Solution shall be mixed externally to the solar system and consist of 30 or 50 percent propylene-glycol and 70 or 50 percent water by volume. System pressure at the high point on the roof shall be 10 psig minimum.
- 3.2.4.5 Operational Test: Operational test shall occur over a period of 48 consecutive hours with sufficient solar insolation to cause activation of the solar energy system during daylight hours. With system fully charged so that pressure at the high point on the roof or the lowest system pressure is a minimum of 10 psig and with fluid and pump[s] energized, sight flow indicator must indicate flow floweret must indicate flow as indicated. Calibrated balancing valves with pressure taps shall indicate bank flow rate as shown.
- 3.2.4.6 Control Logic: By substituting variable resistors for collector and storage tank temperature sensors, Contractor shall demonstrate the differential temperature controller correctly energizes the system pump[s] when the collector sensor indicates a temperature of 15 degrees F greater than the storage tank temperature, as indicated on the controller display panel. The differential temperature controller shall de-energize the system pump[s] when the displayed temperature of the solar collectors is degrees 5 degrees F greater than the displayed temperature of the storage tank.
- 3.2.4.7 Temperature Sensor Diagnostics: Contractor shall demonstrate that the controller will correctly identify open and short circuits on both the solar collector temperature sensor circuit and the storage tank sensor circuit.
- 3.2.4.8 Overall System Operations: Contractor shall demonstrate that the solar energy system will operate properly while unattended for a period of at least 72 hours. The system must demonstrate that the controller will start pump[s] after being warmed by the sun, and that it will properly shut down during cloudy weather or in the evening over a minimum of three complete cycles. Contractor is permitted to manipulate the temperature of the storage tank by the introduction of cold water at local groundwater temperature.
- 3.3 Field Training: A field training course shall be provided for designated operating and maintenance staff members. Training shall be provided for a minimum period of 16 hours of normal working time and shall start after the system is functionally complete but prior to final acceptance tests. The training shall include discussion of the system design and layout and demonstrations of routine operation and maintenance procedures. This training shall include: normal system operation and control; flow balancing; detection of a nonfunctioning system due to sensor, controller, and/or mechanical failure; filling, draining, and venting of the collector array; replacement of sensors, collectors, and collector components; collector cleaning and inspection for leaks; and heat exchanger cleaning and expansion tank charging if applicable.

**Vehicle Barriers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of portable, semi-permanent, permanent, power-assisted or manually deployed vehicle barriers. Type, size and capacity shall be as indicated or shall match existing.
- 2.0 PRODUCTS:
  - 2.1 Retractable Barriers: In the raised position, the total retractable barrier heights shall be no less

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- than 28 inches above the roadway surface and the width indicated. In the lowered position, the retractable barrier shall extend no more than 5/8 inch above the roadway surface. Retractable barriers in the lowered position shall be capable of supporting a 32,000-pound axle load or a 16,000-pound wheel load. Design for this load shall be in accordance with AASHTO-01.
- 2.1.1 Powered retractable barrier shall be capable of 240 complete up/down cycles per hour. Barrier motion shall be instantly reversible and shall be capable of raising the barrier from the lowered position to the raised position within 8 seconds during normal use, and within 2 seconds during an emergency. Barrier shall be capable of being closed from the raised position to the lowered position in not more than 3 seconds. Portable power-assisted retractable barriers shall be equipped with on and off ramps for smooth transition between surfaces.
    - 2.1.1.1 Failure Modes of Operation: The system shall be designed to prevent lowering of the barrier in the event of hydraulic, electrical, or mechanical failure. A manual pump shall be included for operation of hydraulic and/or mechanical barriers without power.
    - 2.1.1.2 Electric Motors: Unless otherwise indicated, electric motors shall have totally enclosed enclosures.
    - 2.1.1.3 System shall be designed to maintain the barriers in the raised position, without inspection, for periods of time of up to 1 week. Equip hydraulic systems with pressure relief valves to prevent overpressure.
    - 2.1.1.4 Hydraulic power unit shall contain hydraulic fluid which maintains its viscosity between 80 to 4000 saybolt universal seconds (SUS) even at constant heaviest use rate, for an ambient temperature range of 20 degrees F to 150 degrees F. Buried hydraulic lines for the connection of the hydraulic power unit to the barrier shall be flexible and/or carbon steel pipe. Flexible and rigid hydraulic line working pressure shall exceed the maximum system relief pressure. PVC pipe and fittings for burial of hydraulic lines shall be in accordance with ASTM D 3034 Type PS 46 with minimum pipe stiffness of 46.
      - a. Flexible hydraulic lines shall be in accordance with SAE J517.
      - b. Seamless carbon steel pipe shall be in accordance with ASTM A 106.
    - 2.1.1.5 Hydraulic Power Unit Enclosure: A NEMA Type 3R enclosure as specified in NEMA 250 shall be provided to enclose the hydraulic power unit. The enclosure shall be designed for easy removal of the hydraulic power unit and other accessories without complete removal of the enclosure.
  - 2.1.2 Manual retractable barriers shall be capable of being raised and lowered by manual means such as levers or hydraulics requiring a maximum 60 pounds of force. The manual mechanism shall contain a locking pin that accepts a padlock for securing the barrier when it is in the "UP" position.
  - 2.2 Retractable Bollards: Total bollard height in the raised position shall be no less than 30 inches above the roadway surface and shall have an outside diameter of no less than 8 inches. Bollard system shall consist of a minimum of three bollards spaced no more than 32 inches from centerline to centerline of bollards across a 10-foot roadway. Bollards in the lowered position shall be capable of supporting a 16,000-pound wheel load each. Design for this load shall be in accordance with AASHTO-01.
    - 2.2.1 Powered retractable bollards shall be capable of 240 complete up/down cycles per hour. Bollards shall be capable of being raised or lowered within a 3 to 15-second range during normal use and within 2.5 seconds for emergency operations.
      - 2.2.1.1 Failure Modes of Operation: The system shall be designed to prevent lowering of the barrier in the event of hydraulic, electrical, or mechanical failure. A manual pump shall be included for operation of hydraulic and/or mechanical barriers without power.
      - 2.2.1.2 Electric motors shall have totally enclosed enclosures unless otherwise indicated.
      - 2.2.1.3 System shall be designed to maintain the barriers in the raised position, without inspection, for period of time of up to 1 week. If a hydraulic system is used, it shall be equipped with pressure relief valves to prevent overpressure.
      - 2.2.1.4 Hydraulic power unit shall contain hydraulic fluid which maintains its viscosity between 80 to 4000 saybolt universal seconds (SUS) even at constant heaviest use rate, for an ambient temperature range of 20 degrees F to 150 degrees F. For ambient temperatures below 20 degrees F, a hydraulic oil heater shall be provided so that the oil viscosity remains between 80 to 4000 SUS. Buried hydraulic lines for the connection of the hydraulic power unit to the barrier shall be flexible and/or carbon steel pipe. Flexible and rigid hydraulic line working pressure shall exceed the

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- maximum system relief pressure. PVC pipe and fittings for burial of hydraulic lines shall be in accordance with ASTM D 3034 Type PS 46 with minimum pipe stiffness of 46.
- a. Flexible hydraulic lines shall be in accordance with SAE J517.
  - b. Seamless carbon steel pipe shall be in accordance with ASTM A 106.
- 2.2.1.5 Hydraulic Power Unit Enclosure: A NEMA Type 3R enclosure as specified in NEMA 250 shall be provided to enclose the hydraulic power unit. The enclosure shall be designed for easy removal of the hydraulic power unit and other accessories without complete removal of the enclosure.
  - 2.2.2 Manual retractable bollards shall be capable of being raised and lowered utilizing a recessed handle on the top surface of the bollard, with a maximum force of 60 pounds or a manual hydraulic pump requiring a max 60 pounds of force. A recessed panel at the base of each bollard, adjacent to the bollard in the "DOWN" position, shall contain a spring actuated latching mechanism that automatically secures the bollard in either the full "UP" or full "DOWN" position. The panel shall have an access cover with provisions for a padlock to secure the access cover.
  - 2.3 Crash gate shall consist of steel buttresses anchored into the ground and an above grade assembly consisting of a heavy steel structural or a combination of heavy steel and structural aluminum capable of being opened and closed. The height of the gate shall be a minimum of 84 inches from the road surface to the top of the gate frame. The length shall close and protect a minimum 120 inch clear opening. The maximum clear opening between the gate frame and end posts, between the bottom of the gate and finished grade, and between any grill work shall be 3 inches.
    - 2.3.1 Powered Crash Gate: The gate movement shall be controlled by an electromechanical gate operator or a hydraulic gate operator consisting of an operator unit with required control circuits and operator station. The control and operating voltage shall be 24 VAC (nominal).
    - 2.3.2 Failure Mode of Operation: The system shall be designed to prevent opening of the crash gate in the event of electrical or mechanical failure. A disconnect system for the gate drive shall be provided to allow manual operation of the barrier in the event of a power outage.
    - 2.3.3 Manual crash gate shall be capable of being hinged from either side. Hinge points of both buttresses shall each contain a locking pin with padlock acceptance for securing the crash gate in the closed position. The crash gate shall withstand a 10,000-pound vehicle at impact speed of 50 miles per hour, with maximum gate deflection or vehicle penetration of 10 feet.
  - 2.4 Crash beam shall be an above-grade assembly that, in the "DOWN" position, shall present a formidable obstacle to approaching vehicles. The height of the barrier shall be a minimum of 30 inches as measured from the roadway surface to the centerline of the crash beam. The crash beam shall be capable of blocking a minimum road width of 120 inches. The crash beam end shall contain a locking pin with padlock acceptance for securing the crash beam when it is in the "DOWN" position. Crash beam shall withstand a 10,000-pound vehicle at impact speed of 15 miles per hour, with a maximum beam deflection of 20 feet.
    - 2.4.1 Powered crash beam shall be operated by means of a hydraulic power system. The crash beam shall be capable of being raised or lowered within an 8- to 15-second time range.
      - 2.4.1.1 Failure Mode of Operation: A disconnect system for the crash beam shall be provided to allow manual operation of the barrier in the event of an electrical or mechanical failure.
    - 2.4.2 Manual crash beam shall be manually raised and lowered with the aid of a counterbalanced end requiring approximately 60 pounds of force.
  - 2.5 Electrical Work: Motors, manual or automatic motor control equipment except where installed in motor control centers, and protective or signal devices required for the operation specified herein, and wiring required for operation shall be provided in accordance with DIVISION 16 ELECTRICAL Section.
  - 2.6 Control panel and control circuit shall be provided to interface between all barrier control stations and the power unit. The control station is defined as the main control panel and the remote control panel as shown. The control circuit shall contain all relays, timers, and other devices or an industrial programmable controller programmed as necessary for the barrier operation. The control panel shall allow direct interface with auxiliary equipment such as card readers, remote switches, loop detectors, infrared sensors, and gate limit switches. The enclosure shall be as indicated on the drawings. All device interconnect lines shall be run to terminal strips.
    - 2.6.1 Voltage: The control circuit shall operate from a 120 volt 60 Hz supply.

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- 2.6.2 Main control panel shall be supplied to control barrier function. This panel shall have a key-lockable main switch with main power "ON" and panel "ON" lights. Buttons to raise and lower each barrier shall be provided. Barrier "UP" and "DOWN" indicator lights shall be included for each barrier. An emergency fast operate circuit (EFO) shall be operated from a push button larger than the normal controls. The EFO shall also be furnished with an EFO-active light and reset button. The main control panel shall have a key lockable switch to arm or disable the remote control panel. An indicator light shall show if the remote control panel is enabled.
- 2.6.3 Remote control panel shall have a panel "ON" light that is lit when enabled by a key lockable switch on the main control panel. Buttons to raise and lower each barrier shall be provided. Barrier "UP" and "DOWN" indicator lights shall be included for each barrier. The EFO shall be operated from a push button larger than the normal controls. The EFO shall be interconnected with an EFO-active light. When the remote control panel EFO is pushed, operation of the barrier will not be possible from this panel until reset at the main control panel.
- 2.7 Miscellaneous Equipment:
  - 2.7.1 Safety Equipment: Red/yellow 8-inch traffic lights shall be supplied for each entrance and exit to alert motorists of the barrier position. Traffic lights are not required for manual barriers. The yellow light shall indicate that the barrier is fully open. All other positions shall cause the light to show red. Brackets shall be supplied to allow the light to be mounted a minimum 4.5 feet above the roadway pavement on a 3.5-inch outside diameter metal post or mounted directly on the crash gate.
  - 2.7.2 Heater: A waterproof barrier heater with a thermostat control and NEMA 4 junction box connection point shall be provided for de-icing and snow melting. The heater shall provide barrier operation to an ambient temperature of minus 40 degrees F. For retractable bollards, a 250-watt heater shall be provided for each bollard.
  - 2.7.3 Signage shall read "Axle Weight Limit 9 Tons" and shall conform to FHWA-01 sign (R12.2).
  - 2.7.4 Vertical arm gates (Traffic Arms) shall have an opening and closing time of less than or equal to 15 seconds. The gates shall be capable of 15 duty cycles per hour as a minimum. Gate shall operate the arm through 90 degrees. Gate operators shall be supplied with single phase 120 volt motors. Each gate shall be capable of being operated from a remote open-close push button station. Gates shall have a hand-crank mechanism that will allow manual operation during power failures. Each gate shall be supplied with a handcrank. Gate arms shall be constructed out of wood, steel, fiberglass, or aluminum, as specified by the manufacturer for the given lengths as shown on the drawings. Gate arms shall be covered with 16-inch wide reflectorized red and white sheeting. Each gate shall be furnished with a spare gate arm. Gate operator cabinets shall be constructed of galvanized steel and shall be painted manufacturers standard color as approved. Each gate operator shall be provided with an obstruction detector that will automatically reverse the gate motor when an obstruction is detected. The obstruction detector shall be any of the following three types: An electronic loop vehicle detector buried in the road, a photocell electric eye mounted on the gate operator, or a safety strip mounted on the lower edge of the arm. The detector system shall be automatically deactivated when the arm reaches the fully lowered position. Slab size and anchorage for gate operator shall be per manufacturer requirements.
- 2.8 Finish: Surfaces shall be painted in accordance with requirements of DIVISION 9 Section on painting except for materials supplied with manufacturers standard finish. The roadway plate shall have a nonskid surface. The barrier front shall have 6-inch wide reflective yellow stripes 4 inches apart. Bollards shall be painted reflective yellow with 3-inch wide black diagonal stripes. The barrier crash gate shall be painted white and the crash beam shall be painted reflective yellow with 3-inch wide black diagonal stripes.
- 2.9 Concrete shall conform to DIVISION 3 Concrete section.
- 2.10 Welding shall be in accordance with AWS D1.1.
- 2.11 Pavement: After placement of the vehicle barrier, the pavement sections shall be replaced to match the section and depth of the surrounding pavement. Pavement shall be warped to match the elevations of existing pavement. Positive surface drainage, away from the vehicle barrier, shall be provided by pavement slope.
- 3.0 EXECUTION
- 3.1 Installation shall be in accordance with manufacturers instructions.

Attachment 1: Specifications for the Work

- 3.2 Buried hydraulic lines shall be placed in polyvinyl chloride (PVC) sleeves. Positive drainage shall be provided from the hydraulic power unit to the barrier for drainage of condensation within the PVC sleeve.
- 3.3 All controls shall be terminated with compression ring-style terminals. Roundhead screws and lockwashers shall be used to provide vibration-resistant connections. Connections between any printed circuit cards and the chassis shall be made with screw connections or other locking means to prevent shock or vibration separation of the card from its chassis.

**DIVISION 14-CONVEYING EQUIPMENT**

**Passenger Elevators**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of passenger elevators. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Elevators shall be of size, type, and operation directed by the Authorized Member Representative. Elevators shall comply with the requirements of ANSI A17.1 and ANSI A117.1. Elevator cab shall be galvanized metal shell with enamel finish. Elevator doors shall be galvanized metal with enamel finish. Walls of elevator shall have raised plastic laminate panels. Structural and non-exposed Ferrous metal surfaces shall receive two coats of structural grade primer. Elevator shall be complete with protective car pads and hooks.
  - 2.2 Operating Equipment: Motors, pumps, controllers, hydraulic fluid reservoir, cylinder, casing, plunger, piping, guide rails, buffers, buttons, wiring, indicators, hardware, fittings, and all other equipment required to provide a fully operational elevator shall be provided.
  - 2.3 Finishes:
    - 2.3.1 Galvanizing: ASTM A 526, G90 Coating Designation.
    - 2.3.2 Enamel: Shop-applied baked enamel of color as selected by the Authorized Member Representative.
    - 2.3.3 Plastic Laminate: Fed. Spec. L-P-508, color, texture, and pattern as selected by the Authorized Member Representative.
  - 2.4 Wiring: All wiring necessary to connect operating buttons, switches, signals, and all electrical equipment on the car shall be provided. Wiring shall be in accordance with the National Electrical Code and shall, except for traveling cables, be installed in conduit, electrical metallic tubing, or metal wireways, except that flexible conduit may be used for short runs. Traveling cables shall be of the best grade for the service and shall be so installed to provide a proper size loop for the car. Traveling cables shall have a fire-resistant outer braid.
- 3.0 EXECUTION:
  - 3.1 Preparation: Prior to installation of elevator, ensure that shafts and openings for moving equipment are plumb, level, and in line. Check measurements of space for equipment and means of access for installation and operation.
  - 3.2 Installation: Install machinery, guides, controls, car, equipment, and accessories in accordance with applicable codes and standards. Installation shall provide a quiet, smoothly operating installation, free from sidesway, oscillation, or vibration.
  - 3.3 Inspection: At completion of installation, elevator shall be inspected in accordance with ANSI A17.2. All deficiencies shall be corrected and retested.

**Freight Elevators**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of freight elevators. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

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2.0 PRODUCTS:

- 2.1 Elevators shall comply with the requirements of ANSI A17.1. When provisions for the handicapped are required, elevators shall comply with the requirements of ANSI A117.1. Elevator cab shall be galvanized metal shell with enamel finish. Elevator doors shall be galvanized metal with enamel finish. Structural and non-exposed Ferrous metal surfaces shall receive two coats of structural grade primer.
- 2.2 Operating Equipment: Motors, pumps, controllers, hydraulic fluid reservoir, cylinder, casing, plunger, piping, guide rails, buffers, buttons, wiring, indicators, hardware, fittings, and all other equipment required to provide a fully operational elevator shall be provided.
- 2.3 Finishes:
  - 2.3.1 Galvanizing: ASTM A 526, G90 Coating Designation.
  - 2.3.2 Enamel: Shop-applied baked enamel.
- 2.4 Wiring: All wiring necessary to connect operating buttons, switches, signals, and all electrical equipment on the car shall be provided. Wiring shall be in accordance with the National Electrical Code and shall, except for traveling cables, be installed in conduit, electrical metallic tubing, or metal wireways, except that flexible conduit may be used for short runs. Traveling cables shall be of the best grade for the service and shall be so installed to provide a proper size loop for the car. Traveling cables shall have a fire-resistant outer braid.
- 3.0 EXECUTION:
  - 3.1 Preparation: Prior to installation of elevator, ensure that shafts and openings for moving equipment are plumb, level, and in line. Check measurements of space for equipment and means of access for installation and operation.
  - 3.2 Installation: Install machinery, guides, controls, car, equipment, and accessories in accordance with applicable codes and standards. Installation shall provide a quiet, smoothly operating installation, free from sidesway, oscillation, or vibration.
  - 3.3 Inspection: At completion of installation, elevator shall be inspected in accordance with ANSI A17.2. All deficiencies shall be corrected and retested.

**Lifts**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of commercial lifts. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Lifts shall comply with ANSI A17.1.
- 2.1 Lifts shall be electrically operated traction type with counter-weights, winding drum type, or hand-operated chain or screw drive type for low-capacity, infrequent use as required. The lift shall be manufacturer's standard pre-engineered system.
- 2.2 Capacity rating shall be 100 pounds, 50 pounds, or as required.
- 2.3 Speed shall be 50 fpm, with travel distance as required.
- 2.4 Hoistway doors shall be 2 feet 6 inches wide by 3 feet 0 inches high, or as required.
- 2.5 Self-supporting Structure: Provide units with structural steel self-supporting hoistway framing that requires vertical-load support only at base and lateral support only at landing levels to coordinate car movement with hoistway doors.
- 2.6 Machine Locations: Locate lift machines inside the shaft at top or bottom of hoistway as required.
- 2.7 Electric Control System: Provide standard, fully automatic call-and-send operation that responds to momentary push-button signals at each landing.
  - 2.7.1 Pushbuttons shall be inoperative while car is in transit, for a predetermined time period after car arrival at any given landing, or when any doors are open. Delivery calls shall take precedence over calls for service.
  - 2.7.2 Provide adjustable limited period of time for receiving station to make its access to car, before responding to next station call-for-service. Post notice of limitation at each station.
  - 2.7.3 When delivery has been completed, doors are closed, and no calls-for-service are registered, return car automatically for parking at indicated "home" station.
- 2.8 Materials and Finishes:

Attachment 1: Specifications for the Work

- 2.8.1 Enameled Steel: Formed steel units with baked synthetic enamel finish.
- 2.8.2 Primed-for-Paint Steel: Formed steel units with baked metal primertion, free from sidesway, oscillation or vibration.
- 2.8.3 Stainless Steel: AISI Type 302/304, with directional polish or satin finish.
- 2.8.4 Plastic Laminate: High-pressure type complying with NEMA LD3, 0.05 inch thickness.
- 2.9 Car Construction:
  - 2.9.1 General: Provide car construction of either formed, reinforced, and sound-deadened sheet metal with welded joints; or of metal-clad plywood with mechanically riveted or bolted joints, with exposed edges of plywood covered with metal and with internal seams sealed by soldering. Provide shelves, compartments, gates and other features as required.
  - 2.9.2 Car Light: Equip car with recessed incandescent light fixture, located in ceiling near front of car. Provide perforations or glazed port through car gate and hoistway doors near light location, sufficient for observation that car is present at landing.
- 2.10 Car Gates:
  - 2.10.1 Manual car gates shall be of counterbalanced bi-parting vertical sheet steel with black enamel finish and electrical interlocks.
  - 2.10.2 Power-operated car gates shall be vertical bi-parting gates, equipped with power operator and connecting linkages to operate hoistway doors at landing when car is present.
- 2.11 Hoistway Doors: Provide flush hollow metal doors and frames of counterbalanced vertical bi-parting design.
- 2.12 Signal Equipment: Provide signal equipment at each landing hall push-button station; include call button, send button for each landing served, and illuminated "car-in-use" pilot light that flashes when car arrives at landing (until door is opened). Provide recessed station set in face of door jamb with surface-mounted stainless steel face plate.
- 2.13 Door Buttons: Where power operated doors are required, provide momentary pressure "door open" and constant pressure "door close" buttons.
- 2.14 Audible Arrival Signal: Provide standard bell or gong system on top of each car, equipped to sound as car approaches landing.
- 2.15 Audible Call Signal: Provide standard buzzer system on top of car, equipped to sound continuously when any call button is depressed and held, but only if car is located at a landing where hoistway door or car gate is open.
- 3.0 EXECUTION: (Section not used).

**Personnel Lifts**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of personnel lifts. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Personnel Lifts: Personnel lifts shall be electrically operated, electronically controlled platform type. Capacity shall be as directed. Lift shall have a capacity safety factor of 5. Lift speed shall not exceed 30 feet per minute. Platform shall be welded and bolted steel construction. Drive belts and/or chains shall have safeties that automatically lock the carriage to the guide rails in the event of slack or lift belt/chain failure. Lifts shall conform to ANSI A90.1. Lifts shall be complete with necessary screens and guards for moving parts and floor openings.
  - 2.2 Controls: Personnel lifts shall be provided with normal and final limit switches at each stop. Lifts shall have emergency stop switch.
  - 2.3 Motor: Motors shall be sized for capacity of lifts. Motor shall be direct drive, gear type with electric brake. Power requirements shall be as directed.
  - 2.4 Wiring: All wiring necessary to connect operating buttons, switches, signals, and all electrical equipment on lifts shall be provided. Wiring shall be in accordance with the National Electrical Code and shall, except for traveling cables, be installed in conduit, electrical metallic tubing, or metal wireways, except that flexible conduit may be used for short runs. Traveling cables shall be of the best grade for the service and shall be so installed to provide a proper size loop for the car. Traveling cables shall have a fire-resistant outer braid.

Attachment 1: Specifications for the Work

3.0 EXECUTION:

- 3.1 Preparation: Prior to installation of lifts, ensure that shafts and openings for moving equipment are plumb, level, and in line. Check measurements of space for equipment and means of access for installation and operation.
- 3.2 Installation: Install machinery, guides, controls, lifts and equipment, and accessories in accordance with applicable codes and standards. Installation shall provide quiet, smooth operation free from sidesway, oscillation, or vibration.
- 3.3 Inspection: At completion of installation, lifts shall be inspected in accordance with ANSI A17.2. All deficiencies shall be corrected and retested.

**Chair Lifts**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of chair lifts. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

- 2.1 Chair lifts shall be of size, type, and configuration designated and shall be designed for the applicable stair configuration. Chairs applicable shall be padded, vinyl upholstered type. Chair lifts shall comply with the requirements of ANSI A90.1.
- 2.2 Operating Equipment: Motors, controllers, casings, guide rails, buffers, buttons, wiring, indicators, hardware, fittings, and all other equipment required to provide fully operational chair lift shall be provided.
- 2.3 Wiring: All wiring necessary to connect operating buttons, switches, signals, and all electrical equipment on chair lifts shall be provided. Wiring shall be in accordance with the National Electrical Code and shall, except for traveling cables, be installed in conduit, electrical metallic tubing, or metal wireways, except that flexible conduit may be used for short runs. Traveling cables shall be of the best grade for the service and shall be so installed as to provide a proper size loop for the chair lift. Traveling cables shall have a fire resistant outer braid.

3.0 EXECUTION:

- 3.1 Preparation: Prior to installation of chair lifts, ensure that installation surfaces are true to lines and levels. Check measurements of space for equipment and means of access for installation and operation.
- 3.2 Installation: Install machinery, guides, controls, chair lifts, equipment, and accessories in accordance with applicable codes and standards. Installation shall provide a quiet, smooth operation, free from sidesway, oscillation, or vibration.
- 3.3 Inspection: At completion of installation, chair lift shall be inspected in accordance with ANSI A17.2. All deficiencies shall be corrected and retested.

**Vehicular Lifts**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of vehicular lifts. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

- 2.1 Vehicular Lifts: Lifts shall comply with ANSI B153.1. Lifts shall have automatic mechanical lift lock. Lift lock shall be automatically activated when lift is operated to full stroke to prevent accidental lowering.
- 2.2 Operating Equipment: Motors, controllers, casings, pumps, hydraulic fluid reservoir, cylinder, plunger, piping, buffers, wiring, indicators, hardware, fittings, and all other equipment required to provide a fully operational elevator shall be provided.
- 2.3 Wiring: All wiring necessary to connect operating buttons, switches, signals, and all electrical equipment on the lift shall be provided. Wiring shall be in accordance with the National Electrical Code and shall be installed in conduit, electrical metallic tubing, or metal wireways, except that flexible conduit may be used for short runs.

3.0 EXECUTION:

Attachment 1: Specifications for the Work

- 3.1 Preparation: Prior to installation of vehicular lifts, ensure that shafts and openings are plumb, level, and in line. Check measurements of space for equipment and clearances for operation.
- 3.2 Installation: Install machinery, controls, and lift and its equipment and accessories in accordance with manufacturer's instructions and applicable codes and standards, to provide a quiet, smoothly operating installation, free from sidesway, oscillation, or vibration.

**Trash Chutes**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of trash chutes. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work. Contact the fire protection engineering branch for the specific requirements of fire protection.
- 2.0 PRODUCTS:
  - 2.1 General: Chutes shall be gravity type in accordance with the standards of NFPA 82. Intake doors shall bear the UL Class B, 1-1/2 hour, 250 F rating. Doors shall be tested in accordance with ASTM E 152 Fire Endurance Test. 2.2 Chutes: Chutes shall be manufactured of galvanized steel, aluminized steel, or stainless steel, as directed. Galvanized steel and aluminized steel shall be minimum 18 gauge. Stainless steel shall be minimum 0.05 inch thick. Diameter of chute shall be as directed. Chutes shall be provided with necessary supports.
  - 2.3 Intake Doors and Frames: Chutes shall be equipped with Type 302 stainless steel, hand hopper type intake doors bearing the UL Class B, 1-1/2 hour rating. Surfaces of doors and frames shall have satin finish. Doors shall be sized in accordance with the requirements of NFPA 82. Frame trim shall be minimum 0.060 inch thick, Type 302 stainless steel. Doors shall be self-closing and positive latching.
  - 2.4 Outlet Doors: Outlet door shall be UL "B" label 1-1/2 hour fire rated, and equipped with a fusible link to be self closing and self latching.
  - 2.5 Vent: Trash chute shall be provided with a roof vent in accordance with NFPA 82. Vent shall extend 4 feet minimum above roof line and be provided with flashing as required to provide a watertight installation. Vent shall be same diameter and material as trash chute. Vent shall be provided with a rain cap and bird screen.
  - 2.6 Sprinklers: Sprinkler shall be provided as required by NFPA 82 and as directed. Sprinklers shall be installed in accordance with NFPA 13.
  - 2.7 Hopper: Each trash chute shall be provided with a hopper type receptacle.
- 3.0 EXECUTION:
  - 3.1 Preparation: Prior to installation of trash chute, ensure that shafts and openings are plumb, level, and in line. Check measurements of space for materials and means of access for installation.
  - 3.2 Installation: Install trash chute in accordance with applicable codes and standards. Ensure that installation procedures maintain required fire resistance ratings.

**Water Treatment Plant Traveling Screens**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of traveling screens for water treatment intake structures. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Replacement motors and parts shall have the same characteristics and as the motors and parts to be replaced, unless otherwise approved.
  - 2.2 Replacement pumps shall comply with design specifications for head, capacity, material of construction, and motor characteristics of the pumps to be replaced.
  - 2.3 Finishes for items replacing existing items that are galvanized or painted shall be finished with like finish in compliance with manufacturer's standard practice.
  - 2.4 Screen wash nozzles shall be stainless steel, brass, or bronze. Stainless steel shall be Type 316. Brass shall comply with ASTM B 282. Bronze shall comply with ASTM B 255.

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- 2.5 Screen metal fabric shall be stainless steel complying with ASTM A 580.
- 2.6 Screen frame shall be steel or stainless steel. Stainless steel parts shall comply with ASTM A 193, A 480, and A 564. Steel shall comply with ASTM A
- 36. Steel fasteners shall comply with ASTM A 307 or A 325.
- 3.0 EXECUTION:
- 3.1 General: Screen, wash pumps, controller, drive equipment, and appurtenances shall be repaired, lubricated, and placed back in service.
- 3.2 Welding shall be done in compliance with AWS D1.1.

**Cranes and Hoists**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of cranes and hoists. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Crane: Crane Manufacturers Association of America (CMAA) 70 for electric overhead traveling cranes or ANSI MH27.1 for underhung cranes and monorail systems.
- 2.2 Hoist: Electric wire rope type, ANSI/ASME HST-4M.
- 3.0 EXECUTION: The derrick shall be assembled and installed with the guy wires placed in position, hoisting ropes installed, and the derrick made ready for regular operation. Equipment installed outdoors shall be primed and finish-painted with a suitable corrosion-resistant paint on all parts and components not otherwise made of corrosion-resistant materials or otherwise protected.

**Ash Hoists**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of ash hoists. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Winches and Sheaves:
- 2.1.1 Wire rope sheaves shall be iron or steel with bronze bushings, furnished either plain or as an assembly of frame, sheave, swivel hook, and axle as required.
- 2.1.2 Winches shall be of steel construction with bronze bearings on rotating parts. Winches shall have a capacity of not less than 500 pounds, with band action handbrake and drum width adequate for the quantity and diameter of wire rope to be used. Winches shall be marine type with gear cover and shall have corrosion-resistant parts and finish suitable for outdoor use.
- 2.1.2.1 Power Winches: NEMA 3 weather-protected, with two speeds (30 or 60 fpm) for lifting and a single speed for lowering, automatic upper-limit switch for hook travel, with push-button control.
- 2.1.2.2 Hand wench shall have spring-operated holding dogs, free-spooling feature, and adjustable handles.
- 2.1.3 Wire Rope: Wire rope shall be flexible, hoisting grade composed of approximately 7 strands or bundles of small diameter steel wire with a fiber or independent wire rope core.
- 2.2 Mast and Boom: Mast, boom, and miscellaneous fabricated components shall be provided as required to complete the unit assembly. Boom shall rotate. Fabricated parts shall be finished with a corrosion-resistant paint.
- 2.2.1 Mast shall telescope where required. Fully extended mast shall allow transport of ash container from bottom of pit to bed of truck without handling container twice.
- 2.2.2 Ash-handling pit shall have watertight door covering where required. Doors shall be mechanically linked to mast so that they automatically open and close with the raising and lowering of the mast.
- 3.0 EXECUTION: The Contractor shall complete the assembly of any equipment furnished partially assembled and place the items in position as directed. The ash hoist shall be assembled and securely bolted in position, hoisting ropes installed, and the hoist made ready for regular operation. The Contractor shall furnish all miscellaneous hardware items required to complete the installation

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of all equipment and components. Equipment shall be primed and finish painted with a suitable corrosion-resistant paint on all parts and components not made of corrosion-resistant materials or otherwise protected.

**DIVISION 21-FIRE SUPPRESSION**

**Fire Protection Systems**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of fire protection systems. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Fire protection system materials and components shall be Underwriters' Laboratories (UL) listed and/or Factory Mutual System (FM) approved for their intended use in accordance with all applicable National Fire Protection Association (NFPA) National Fire Codes.
  - 2.2 Test reports shall be submitted for all tests required by referenced publications applicable to the particular materials and components furnished for use in the work.
- 3.0 EXECUTION:
  - 3.1 The design, fabrication, installation, and testing of fire protection systems shall be in accordance with all applicable NFPA National Fire Codes and their respective appendices. These codes include but are not necessarily limited to the following:
    - NFPA 12 Carbon Dioxide Extinguishing Systems
    - NFPA 16A Closed-Head Foam-Water Sprinkler Systems
    - NFPA 17 Dry Chemical Extinguishing Systems
    - NFPA 1961 Fire Hose
    - NFPA 1962 Fire Hose, Care, Maintenance and Use
    - NFPA 1963 Fire Hose Connections
    - NFPA 20 Fire Pumps, Centrifugal
    - NFPA 30 Flammable and Combustible Liquids Code
    - NFPA 11 Foam Extinguishing Systems•15301
    - NFPA 11A Foam Systems, Medium and High Expansion
    - NFPA 16 Foam-Water Sprinkler and Spray Systems
    - NFPA 12B Halon 1211 Fire Extinguishing Systems
    - NFPA 12A Halon 1301 Fire Extinguishing Systems
    - NFPA 24 Private Fire Service Mains
    - NFPA 231C Rack Storage of Materials
    - NFPA 13A Sprinkler Systems, Care, Maintenance
    - NFPA 13 Sprinkler Systems, Installation
    - NFPA 14 Standpipe and Hose Systems
    - NFPA 26 Water Supplies, Valves Controlling
    - NFPA 22 Water Tanks for Private Fire Protection
  - 3.2 Scheduling Interruptions and Coordination: At least 48 hours before commencing work on any specific system, the Contractor shall notify the Authorized Member Representative of all interruptions, if any, that must be made to the system and the estimated period of time the system will be out of service during each interruption. Interruptions shall be made only at the time or times approved by the Authorized Member Representative. Equipment and standby systems shall be provided for building protection during interruption to the existing systems.
  - 3.3 Tests: All field tests required by applicable standards shall be performed in the presence of the Authorized Member Representative.

**Sprinkler System**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of wet and/or dry-pipe sprinkler system.. Products shall match existing materials and/or shall be as directed by

Attachment 1: Specifications for the Work

- the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: System shall interface with building fire and smoke alarm system. System shall meet NFPA 13 specifications.
  - 2.1 Piping Materials: Buried Piping: Cast or Ductile iron. B. Above Ground Inside Building Piping: Steel, Schedule 40, black.
  - 2.2 Gate Vales: Up to and Including 2 Inches: Bronze body, bronze trim, rising stem, handwheel, inside screw, solid wedge or disc, solder or threaded ends. Over 2 Inches: Iron body, bronze trim, rising stem, handwheel, OS&Y, solid wedge, flanged or grooved ends.
  - 2.3 Check Valves: Up to and Including 2 Inches: Bronze swing disc, solder or screwed ends. Over 2 Inches: Iron body, bronze trim, swing disc, renewable disc and seat, flanged ends. Iron body, bronze trim, stainless steel spring, renewable composition disc, screwed, wafer or flanged ends.
  - 2.4 Drain Valves: Bronze compression stop with nipple and cap or hose thread. Brass ball valve with cap and chain, 3/4 inch hose thread.
  - 2.5 Piping Specialties:
    - 2.5.1 Wet Pipe Sprinkler Alarm Valve: Check type valve with electrically or hydraulically operated alarms, with pressure retard chamber and variable pressure trim.
    - 2.5.2 Alarm Gong: Electrically operated vibrating type bell, 8" diameter with weatherproof backbox. To be activated by flow/pressure switch.
    - 2.5.3 Fire Department Connection: Standard wall type; ductile iron; chrome plated finish; thread size to suit fire department hardware; two way threaded dust cap and chain of same material and finish, 3/4 inch (19 mm) automatic drip connected to drain; marked "Sprinkler - Fire Department Connection".
    - 2.5.4 Water flow switch: Vane type with delay adjustments and two contacts (for wet systems only). Provide type as permitted by NFPA 13 for dry systems.
    - 2.5.5 Dry Pipe Valve: Provide dry pipe system in areas subject to freezing. U.L. listed low differential type with protection against accumulation of water above the clapper by an automatic draining device. Provide drains suitable for dry pipe systems according to NFPA 13. Provide dry pendent heads in areas where pendants are used.
    - 2.5.6 Air Compressor: Automatically maintained pressure system capable of restoring normal air pressure in the system within 30 minutes. Provide domestically manufactured assembly. Air compressor shall be single stage for motors below 1-1/2 hp and two stage for 1-1/2 hp and above, capable of producing air at 150 psi. Sixty gallon tanks and larger shall be ASME stamped. Pumps shall be cast iron with metal belt guard, intake air filter, pressure switch control, tank gauge, check valve, tank drain, pressure relief valve and outlet valve. Motor speed shall not exceed 1200 rpm. Magnetic starters and overloads shall be provided for all three phase motors.
    - 2.5.7 Gate Valve and Indicator Post: Gate valves for underground installation shall be of inside screw type with counter-clockwise rotation to open. Indicating valves shall be gate valves with approved indicator post of length to permit the top of the post to be located 35" above finished grade. Gate valves and indicator posts shall be UL or FM listed.
    - 2.5.8 Double Check Valve Assemblies: ASSE 1015, AWWA C510-89; stainless steel body with corrosion resistant internal parts and stainless steel springs; two independently operating check valves with test cocks and two OS&Y shutoff valves. Approved for use in fire protection systems and approved for installation in the vertical position.
  - 2.6 Sprinkler Heads:
    - 2.6.1 Suspended Ceiling Type: Standard pendant type with chrome plated finish, with matching escutcheon.
    - 2.6.2 Exposed Area Type: Standard upright type with chrome plated finish.
    - 2.6.3 Sidewall Type: Chrome plated finish with matching escutcheon.
    - 2.6.4 Fusible Link: Temperature rated for specific area hazard.
  - 3.0 EXECUTION
    - 3.1 Coordinate work of this Section with other affected work and reflected ceiling plan.
    - 3.2 Ream pipe and tube ends to full inside diameter. Remove burrs.

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- 3.3 Remove scale and foreign material, inside and out, before assembly.
- 3.4 Installation:
  - 3.4.1 Install buried shut-off valves in valve box. Provide post indicator.
  - 3.4.2 Provide vertical type double check valve assembly in sprinkler system riser. Provide tamper switches for each valve and connect to the alarm panel.
  - 3.4.3 Locate fire department connection with sufficient clearance from walls, obstructions, or adjacent siamese connectors to allow full swing of fire department wrench handle.
  - 3.4.4 Locate outside alarm gong on building wall.
  - 3.4.5 Place pipe runs to minimize obstruction to other work.
  - 3.4.6 Place piping in concealed spaces above finished ceilings.
  - 3.4.7 Center heads in one direction only in ceiling tile with location in other direction variable, dependent upon spacing and coordination with ceiling elements.
  - 3.4.8 Slope piping and arrange systems to drain at low points.
  - 3.4.9 Route piping in orderly manner, plumb and parallel to building structure.
  - 3.4.10 Exposed Areas: Paint piping with one coat zinc chromate primer and two coats alkyd enamel to match wall/ceiling color. Provide stencils or pipe markers.
  - 3.4.11 Mechanical Rooms and Concealed areas: Paint piping with one coat zinc chromate primer and two coats red Alkyd enamel.
  - 3.4.12 Connect water flow switch to alarm panel.
  - 3.4.13 Locate outlet of test valve outside building 2'-0" above grade with splash block.
  - 3.4.14 Piping for inspectors test shall **not** be visually installed on exterior walls or in finished areas. Install piping concealed in wall or construct furred out space to conceal piping. Provide access door where needed for access valves.
- 3.5 Cleaning: Flush entire piping system of foreign matter.
- 3.6 System Acceptance:
  - 3.6.1 System acceptance shall be in accordance with NFPA 13.
  - 3.6.2 Test shall be witnessed by member.
  - 3.6.3 Test control sequence for operation.
  - 3.6.4 At time of the systems acceptance the contractor shall fill out the Contractor's Material and Test Certificate and submit for final approval.
  - 3.6.5 Backflow preventer assemblies shall be tested in accordance with the International Plumbing Code at the time of installation.

**DIVISION 22-PLUMBING**

**Plumbing**

- 1.0 DESCRIPTION OF WORK: This specification covers the installation, repair or replacement of plumbing systems. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 All work shall comply with the manufacturer's instructions, industry standards and the Arizona Uniform Plumbing Code (UPC).
  - 2.1 Unless approved by the architect or construction manager, provide related products and accessories from one manufacturer.
  - 2.2 Contractor will provide and install plumbing as shown on drawings and/or as specified by the Mohave member
  - 2.3 The contractor will confirm the following: 1) there is no conflict between the scope of work and building codes, safety codes, and the Arizona UPC; 2) there is no conflict between this work and other trades; 3) what work (if any) that other trades must accomplish prior to this work; 4) that all requirements to meet warranties are being met.
  - 2.4 Contractor agrees to: deliver, store, and transport materials to avoid damage to product or to any other work; reject and return any products or materials delivered damaged or in an unsatisfactory condition.

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- 2.5 Store materials indoors or in a storage facility, protected from vandalism, theft, dirt, dust, moisture, contaminants, etc.
- 2.6 Sanitary sewer piping within the building line shall be: Polyvinyl Chloride (PVC) pipe, solvent weld joints; Acrylonitrile butadiene styrene (ABS) pipe, solvent weld joints; cast iron pipe, service weight, neoprene gaskets; cast iron pipe, hubless, neoprene gaskets, stainless steel clamps.
- 2.7 Water supply pipe below grade beyond the building line shall be: 1) copper tubing, type K annealed, wrought copper fittings, compression joints; 2) cast iron pipe, ductile iron fittings, rubber gaskets, mechanical joints, 3/4 inch diameter rods; 3) PVC pipe, schedule 40, minimum 150 psi pressure rating, solvent weld joints.
- 2.8 Water supply pipe above grade and within the building line shall be: 1) copper tubing, type M, hard drawn, cast brass or wrought copper fittings, soldered joints; 2) Chlorinated Polyvinyl Chloride (CPVC) pipe, CPVC fittings, solvent weld joints; 3) PB pipe, PB, or copper fittings, copper compression rings.
- 2.9 Natural gas pipe below grade level and beyond the building line shall be steel, schedule 40, black with polyethylene jacket, welded joints.
- 2.10 Natural gas pipe above grade and within the building line shall be steel, schedule 40 black, malleable iron or forged steel fittings, screwed or welded.
- 2.11 Provide clearly marked, easily accessible, and tested shut off valves for natural gas as required by the building code.
- 2.12 Fuel oil pipe below grade shall be steel, schedule 40 black, polyethylene jacket and welded joints.
- 2.13 Fuel oil piping above ground shall be steel, schedule 40 black, malleable iron or forged steel fittings, screwed or welded.
- 2.14 Provide clearly marked, easily accessible, and tested shut off valves for fuel oil as required by the building code.
- 2.15 Water heater(s) will be identified as to size, manufacturer, model number, flue passage, baffle and draft hood, insulation, finish, thermostat, pressure regulator, and safety devices.
- 2.16 The architect or construction manager will specify gas or electric water heaters. Tie downs as specified by the building code or architect will be installed.
- 2.17 All work conditions must be as per manufacturer's instructions, trade and workmanship standards, governing building and safety codes, and the Arizona UPC.
- 2.18 Prepare all vents and related support construction for plumbing and mechanical equipment as required by the owner, architect, and/or construction manager.
- 2.19 Contractor will install, repair or replace the following: backflow preventers, cleanouts, cleanout tees, connectors, drains (including, but not limited to; floor drains, drains with strainers, gutter drains, rooftop drains, trench drains, sewer control drains), faucets, floor receptors, hydrants, shock absorbers, drinking fountains and support carriers, water closets, traps, pipe support hangers and systems, valves, plumbing fixtures (baths, bidets, drinking fountains, hot water dispensers, eye wash fountains, interceptors, laboratory equipment, lavatories, sinks, urinals, showers, toilets and toilet seats, wash centers and fountains, water closets, water filters), pumps, plumbing appliances (water chillers, water coolers and heaters), and plumbing for fire protection systems, heating and air conditioning systems (HVAC piping).
- 2.20 Contractor will install, repair, and or replace buried or elevated plastic, cast iron, copper [pipe and tubing], corrosion-resistant, glass, stainless steel, and steel piping.
- 2.21 Contractor will supply the following: ABS and PVC Drains, ABS and PVC Roof Drains, ABS Cleanout Fittings, ABS Material for Pipe and Fitting), Acid Waste Systems, Adapters, Air Admittance Valves, Airgap Fittings, Automatic Hot Water Delivery System, and Automatic Water Heater Shut-Off Valves.
- 2.22 Contractor will supply the following: ABS and PVC Drains, ABS and PVC Roof Drains, ABS Cleanout Fittings, ABS Material for Pipe and Fitting), Acid Waste Systems, Adapters, Air Admittance Valves, Airgap Fittings, Automatic Hot Water Delivery System, and Automatic Water Heater Shut-Off Valves.
- 2.23 The contractor will provide the following: Clamps (Stainless Steel), Cleanouts, Closet & Urinal Spuds, Closet Rings and Supports, Collectors, Connector – Gas, Copper Drainage Tube, Copper Fittings, Corrugated Fittings, Couplings, CPVC Hot & Cold Water Fittings, Pipe & Tubing, Crimp

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- Style Brass/Copper Fittings, Crosslinked Polyethylene Tubing, Crosslinked Polyethylene Water Distribution Systems, and Cured-In-Place Thermosetting Resin Conduit Liner.
- 2.24 The contractor will provide the following: Dental Vacuum Pumps, Dielectric Fittings, Diverter Valves, Domestic Thermoplastic Waste Tube & Fittings, Drain Tube & Connectors, Drains & Joints, Drain, Waste and Vent Fittings, Drain, Waste and Vent Internal Cleanout Fittings, and Early Closure Flapper (Retrofit).
  - 2.25 The contractor will provide the following: Expansion Couplings, Extruded Polyolefin Pipe Coatings, Faucets, Valves, Fill Valves, Fittings, Fixture Stops, Flapper Valves, Flexible Water Connectors, Floor Sinks, Flush Valves, Flushing Siphons for Water Closet Tanks, Flushometer Tank, Flushometer Valves, Food Waste Disposer, and Fusion-Bonded Pipe Coatings.
  - 2.26 The contractor will provide the following: Gas Meter Risers & Transition Fittings, Gas Piping Corrugated Stainless Steel Tubing, Gas Service Risers, Gas Supply Connectors, Grease Trap, Hand-Held Showers & Shower Heads, Heat Exchangers, Hose (Dishwasher Waste), Hot Water Circulation Device, Hubless Cast Iron Soil Pipe and Fittings, Hubless Pipe Couplings & Bushings, and Hydrants (Frostproof).
  - 2.27 The contractor will provide the following: Industrial Drains (Stainless Steel), Insulated Protectors (P-Traps, Risers & Supply Stops), Interceptors & Clarifiers, Joint Drain, Waste and Vent Expansion, Piston Driven, Laundry Trays Holding Tanks, Large Diameter Corrugated Polyethylene (PE) Tubing & Fittings, Laundry Trays, Lavatories & Sinks, Leach Line Pipe, and Leaching Chamber.
  - 2.28 The contractor will provide the following: Mechanical Couplings for Polyethylene Piping, Metal Pipe & Tubing Branching Tools, Mop Basins, Non-Pressure Water Hose & Tubing, Odor Removing Toilet, Outlet Boxes, Pedestal Lavatory Traps, Pipes, Pipe Wrap Tapes, Pivoting Shampoo Sinks, Plastic Hangers, Clamps, Plumber's Tape, Plastic Plumbing Fixtures (MHRV), Plate Skimmers, Plumbing Fixtures, Polyethylene Cold Water Pipe or Tubing, Polyethylene Gas Pipe (PE), Polyvinylidene Fluoride Drain, Waste and Vent Pipe, Pool Fittings, Porcelain Enameled Fixtures, Porous Filter Protector for Sub-Drain Weep Holes, Potable Water Distribution Manifold, Pre-Pressurized Potable Water Tank, Pressure Couplings & Fittings, Pumps, PVC Cold Water Compression & Gripper Fittings, and PVC Cold Water Pipe & Fittings.
  - 2.29 The contractor will provide the following: Rainwater Valves, Remote Industrial Floor Box, Restaurant Fire Suppression System, Retractable Water Hose Reel, Roof Drains, Roof Flashings, Roof/Deck Drains, Safety Suction Valves, Seepage Pit Liners & Covers, Septic Tanks, Service Sinks, Sewage Holding Tanks, Sewer Fittings, Sewer Pipe & Fittings Shampoo Basins, Showers, Sink Tailpiece Drain Coupling, Sinks & Lavatories Smoothwall Polyethylene (PE) Pipe, Solar Water Heater, Solder, Solvent Cement & Primers, Spas, Stainless Steel Pipe, Spigots and Joints, Suction Fittings, Sumps and Sewage Ejector Tanks, and Supply Risers.
  - 2.30 The contractor will provide the following: Vacuum Breakers, Vacuum Toilet Systems, Valves, Valves - Backflow Preventer and Relief, Vent Caps, Vitrified Clay Pipe, Fittings, Hubless Pipe Couplings (Unshielded) Bushings & Stoppers, Waste Disposers, Waste Water Trim, Wasteholding Tanks, Water Closets, Water Conditioners, Water Devices, and Water Fill Spouts.
  - 2.31 The contractor will provide the following: Test Plugs, Therapy Pool, Thermoplastic Gas Pipe, Tubing and/or Fittings, Tile Flange Kits, Toilets, Trap Primers, Trench Drains, Tub/Shower Valves, Tubing, Tubular Waste Water Trim), and Urinals.
  - 2.32 The contractor will provide the following: Water Hammer Arresters, Water Heaters, Water Leak Detection System, Water Pressure Regulator, Water Pumps (Hand Actuated), Water Saver P-Trap/Trap Primer, Water Tanks, Whirlpool Bathtub & Piping Systems, Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings-Drain, Waste and Vent, and Wrought Copper.
  - 2.33 Upon completion, perform all required pressure tests, inspections, and approvals of the completed systems. Make all required adjustments and corrections at no added cost to the owner. Sterilize the water system and provide copies of a certificate of performance.
  - 2.34 Provide for the maintenance of the work for one year following final approval by the governing agencies. Maintenance includes all work required in manufacturer's instructions such as inspections, adjustment, repair and replacement of parts as required.
  - 2.35 Operating fixtures must perform smoothly. Repair or replace any defective work or equipment. Repair any work that will be undetectable, if defective; redo any repairs that are still defective, as

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directed by the owner, architect, construction manager, or governing regulatory agency.

- 2.36 Upon completion, clean work area; remove scrap and excess materials from the site.
- 2.37 After installation, inspect all work for proper installation or damage.

**DIVISION 23-HEATING VENTILATION AIR CONDITIONING**

**Mechanical Piping**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of piping. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Piping shall comply with ANSI B31.1, where applicable. Piping in pressure systems shall comply with requirements of the ASME Boiler and Pressure Vessel Code, where applicable.
  - 2.1 Steel Pipe:
    - 2.1.1 Pipe: Carbon steel pipe shall comply with ASTM A 53 or A 106. Galvanized pipe shall comply with ASTM A 53. Stainless steel pipe shall comply with ASTM A 312.
    - 2.1.2 Fittings: Malleable iron threaded fittings shall comply with ANSI B16.3. Forged steel threaded and socket weld fittings shall comply with ASTM A 181 and shall be fabricated in compliance with ANSI B16.11. Forged stainless steel threaded and socket weld fittings shall comply with ASTM A 182 and shall be fabricated in compliance with ANSI B16.11. Carbon steel butt welded fittings shall comply with ASTM A 234 and shall be fabricated in compliance with ANSI B16.9. Stainless steel butt welded fittings shall comply with ASTM A 403 and shall be fabricated in compliance with ANSI B16.9.
    - 2.1.3 Flanges: Carbon steel flanges shall comply with ASTM A 181 and shall be fabricated in compliance with ANSI B16.5. Stainless steel flanges shall comply with ASTM A 182 and shall be fabricated in compliance with ANSI B16.5.
    - 2.1.4 Bolting: Carbon steel bolting shall comply with ASTM A 307, Grade B, and shall be fabricated in compliance with ANSI B18.2.1 and B18.2.2. Stainless steel bolting shall comply with ASTM A 193, Grade B8, with hex nuts complying with ASTM A 194, Grade 8F, and shall be fabricated in compliance with ANSI B18.2.1 and B18.2.2.
  - 2.2 Copper and Brass Pipe:
    - 2.2.1 Pipe: Seamless copper pipe shall comply with ASTM B 42. Seamless red brass pipe shall comply with ASTM B 43. Copper pipe to be used with brazing or welding shall be oxygen free and shall comply with ASTM B 302 or B 88.
    - 2.2.2 Fittings: Threaded fittings shall comply with ASTM B 249 and shall be fabricated in compliance with ANSI B16.15. Solder fittings shall comply with ASTM B 88 and shall be fabricated in compliance with ANSI B16.18. Butt welding fittings shall comply with ASTM B 302 or B 88 and shall be fabricated in compliance with ANSI B16.9.
    - 2.2.3 Flanges shall comply with ASTM B 61 and shall be fabricated in compliance with ASME B16.24.
    - 2.2.4 Bolting shall comply with ASTM B 36 and shall be fabricated in compliance with ANSI B18.2.1 and B18.2.2.
  - 2.3 Cast and Ductile Iron Pipe:
    - 2.3.1 Pipe: Bell and spigot pipe shall comply with ASTM A 74 and shall be in compliance with ANSI A112.5.1 and AWWA C106. Bell and spigot pipe is not as readily available as other pipe and shall only be used to repair existing bell and spigot pipe. Push-on type pipe shall comply with ASTM A 377 and shall be in compliance with AWWA C151. Mechanical joint pipe shall comply with ASTM A 377, ANSI and AWWA C111 and C151. Flanged pipe shall comply with ASTM A 377, B16.1, and AWWA C115. Threaded pipe shall comply with ASTM A 377 and shall be threaded at both ends for screwed fittings.
    - 2.3.2 Fittings: Bell and spigot fittings shall comply with ASTM A 74, ANSI A112.5.1, and AWWA C110. Bell and spigot pipe is not as readily available as other pipe and shall only be used to repair existing bell and spigot pipe. Push-on type fittings shall comply with ASTM A 126 or A 536 and AWWA C110. Mechanical joint fittings shall comply with ASTM A 126 or A 536 and AWWA C110 and C111. Flanged fittings shall comply with ASTM A 126 or A 536, ANSI B16.1, and AWWA C110. Threaded

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- fittings shall comply with ASTM A 126 and ANSI B16.4. 2.3.3 Flanges shall comply with ASTM A 126 or A 536, AWWA C115, and ANSI B16.1.
- 2.3.4 Gaskets: Gaskets for cast-iron soil pipe shall comply with ASTM C 564. Gaskets for mechanical joint or push-on type pipe shall comply with AWWA C111.
- 2.3.5 Bolting: Alloy steel bolting shall comply with ASTM A 193, Grade B8, and A 194, Grade 8F. Carbon steel bolting shall comply with ASTM A 307, Grade B, and shall be fabricated in compliance with ANSI B18.2.1 and B18.2.2.
- 2.4 Polyvinyl Chloride Pipe:
- 2.4.1 Pipe: Pressure rated pipe shall comply with ASTM D 1785. Waste, vent, and drain pipe shall comply with ASTM D 2665. Sewer pipe shall comply with ASTM D 2729.
- 2.4.2 Fittings: Threaded fittings shall comply with ASTM D 2464. Socket solvent weld type fittings for pressure pipe shall comply with ASTM D 2466 or D 2467. Socket solvent weld type fittings for waste and drain pipe shall comply with ASTM D 2665. Socket solvent weld type fittings for sewer pipe shall comply with ASTM D 2729. 2.4.3 Flange Dimensions shall be in compliance with ASME B16.5.
- 2.4.4 Bolting shall be alloy steel bolts and nuts complying with ASTM A 193, Grade B8, and A 194, Grade 8F.
- 2.5 ABS Pipe:
- 2.5.1 Pipe: Waste and drain pipe shall comply with ASTM D 2661. Sewer pipe shall comply with ASTM D 2751. All other ABS pipe shall comply with ASTM D 1527.
- 2.5.2 Fittings: Threaded fittings shall be Schedule 80 ABS and shall be industry standard. Socket solvent weld fittings for waste and drain pipe shall comply with ASTM D 2661. Socket solvent weld fittings for sewer pipe shall comply with ASTM D 2751. Socket solvent weld fittings for all other pipe shall be ABS Schedule 40 complying with ASTM D 2468 or ABS Schedule 80.
- 2.6 Vitrified Clay Pipe:
- 2.6.1 Pipe: Regular vitrified clay pipe shall comply with ASTM C 700. Perforated vitrified clay pipe shall comply with ASTM C 498.
- 2.6.2 Fittings shall be regular vitrified clay complying with ASTM C 700. 2.6.3 Compression Joint Sealing Element shall comply with ASTM C 425 and shall be of rubber, plastic, or metal.
- 2.7 Asbestos cement pipe shall not be repaired but shall be replaced with new piping that does not contain asbestos, as directed by the Authorized Member Representative.
- 2.8 Polyethylene Pipe:
- 2.8.1 Pipe: Polyethylene shall comply with ASTM D 2447. Pipe shall be polyethylene SDRPR and shall comply with ASTM D 3035.
- 2.8.2 Fittings: Butt fusion type fittings shall comply with ASTM D 3261. Socket type heat fusion fittings shall comply with ASTM D 2683. Insert type heat fusion fittings shall comply with ASTM D 2609.
- 2.9 Conduit Systems:
- 2.9.1 Carrier Pipe: Carbon steel pipe shall comply with ASTM A 106. Polyvinyl chloride pipe shall comply with ASTM D 1785. Copper pipe shall comply with ASTM B 42. Fiberglass reinforced plastic pipe shall meet commercial standards.
- 2.9.2 Insulation: For systems 250 degrees or less, polyurethane foam insulation shall comply with commercial standards. For systems over 250 degrees, calcium silicate insulation shall comply with ASTM C 533.
- 2.9.3 Outer Jacket: For systems 250 degrees or less, polyvinyl chloride outer jacket shall comply with ASTM D 1785 or fiberglass reinforced plastic outer jacket shall meet commercial standards. For Systems over 250 degrees, cast-iron outer jacket shall comply with ASTM A 377, or steel conduit outer jacket shall be epoxy-coated, spiral weld, 10 gauge minimum.
- 2.10 Gaskets shall comply with ASME B16.21 and/or the following:
- 2.10.1 Gaskets shall be rubber complying with ASTM C 564.
- 2.10.2 Gaskets for mechanical joint or push-on type cast-iron or ductile iron pipe shall be rubber complying with AWWA C111.
- 2.11 Solvent cement for solvent welding of pipe shall comply with ASTM D 2564, except solvent cement for ABS pipe and fittings shall comply with ASTM D 2235.
- 2.12 Dielectric Unions and Flanges:

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- 2.12.1 Dielectric unions and flanges shall comply with Fed. Spec. WW-U-531 and requirements of ANSI B16.39 and ANSI B16.24.
- 3.0 EXECUTION:
- 3.1 Flame Cutting: No cutting by torch shall be done without authorization from the Authorized Member Representative.
- 3.2 Restoration: All disturbed pavement, sodding, soil, and other objects shall be restored to match original condition. Pavement shall be restored with material to maintain the same load bearing capacity as the original.
- 3.3 Welding: All welding shall be performed in compliance with ANSI B31.1 and/or ASME Boiler and Pressure Vessel Code Section IX, as applicable.
- 3.4 Solvent cement joints shall be made in compliance with ASTM D 2855.
- 3.5 Heat Fusion Joints in polyethylene pipe and fittings shall be made in compliance with ASTM D 2657.
- 3.6 Concrete linings in cast and ductile iron pipe shall be prepared with cement mortar complying with AWWA C104. Pipe leak clamps shall be ductile iron, split sleeve type.
- 3.7 Protective covering for replacement underground steel pipe shall be mechanically applied in a factory or field plant especially equipped for the purpose. Specials, valves, and fittings that cannot be coated and wrapped mechanically shall have the protective covering applied by hand. Joints shall be coated and wrapped by hand. The pipe covering shall consist of a coat of coal-tar primer, a coat of coal-tar enamel, a wrapper of coal-tar-saturated asbestos felt, and a wrapper of Kraft paper or a coat of water-resistant whitewash, applied in the order named and complying with the requirements of AWWA C203 in all respects to materials, thicknesses, methods of application, tests, and handling, except that interior lining will not be required. Joints and fittings shall be coated and wrapped in compliance with AWWA C203.
- 3.8 Hydrostatically test pipe systems where required by ANSI B31.1 or ASME Code.
- 3.9 Dielectric unions or flanges shall be provided for connections between ferrous and nonferrous metallic pipe or equipment.
- 3.10 Hubless cast-iron soil pipe shall not be installed under concrete floor slabs or in crawl spaces below kitchen floors.
- 3.11 Plastic pipe shall not be installed under concrete floor slabs, or in air plenums. Plastic pipe shall not be installed in a pressure piping system in buildings greater than three stories including any basement levels.

**Valves**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of valves. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Valve pressure/temperature ratings shall equal or exceed the ratings of the valves being replaced. Pressure/temperature ratings shall be in accordance with ANSI B16.5. Valves shall comply with the ASME Boiler and Pressure Vessel Code where applicable.
- 2.1 Gate valves shall comply with MIL-V-12126, MIL-V-18110, MIL-V-13803, MIL-V-12125, MIL-V-58039, and MSS SP-80 as applicable.
- 2.2 Globe valves shall comply with MIL-C-18434 and with MSS-SP-85, MIL-V-24109, MIL-V-17501, MIL-V-24578, and MSS SP-80 as applicable.
- 2.3 Check valves shall comply with MIL-V-6129 and/or MIL-V-10386 and MSS SP-80.
- 2.4 Needle valves shall comply with MIL-V-24586 and/or with applicable MSS specifications.
- 2.5 Ball valves shall comply with MSS SP-72.
- 2.6 Butterfly valves shall comply with Fed. Spec. WW-V-1967 and/or AWWA C504.
- 2.7 Pressure relief Valves shall comply with MIL-V-23255 and MIL-V-55341.
- 2.8 Pressure regulators shall comply with MIL-V-2962, MIL-V-24384, MIL-V-18318, or MIL-V-16733 as applicable.
- 2.9 Flow control valves shall comply with MIL-V-23254.
- 2.10 Backflow preventers shall comply with AWWA C506.
- 2.11 Vacuum breakers shall comply with MIL-V-5461 and MS-87005.

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- 2.12 Solenoid Operated Valves: Coil shall be epoxy encapsulated, manufactured to UL 429, and rated for ac voltage.
- 2.13 Float valves shall comply with Fed. Spec. A-A-246.
- 2.14 Stop and waste valves shall comply with MIL-V-22052.
- 2.15 Plugs and cocks shall comply with MIL-C-1203 and MIL-V-12003.
- 2.16 Diaphragm valves shall comply with applicable MSS specifications.
- 2.17 Calibrated balancing valves shall be calibrated so that flow can be determined when the temperature and pressure differential across the valve is known. Valves shall have an integral pointer that registers the degree of valve opening. Each valve shall be constructed with internal seals to prevent leakage and shall be supplied with preformed insulation. Valves Cv rating shall be as indicated. Valve bodies shall be provided with quick connecting hose fittings for a portable meter to measure the pressure differential. One portable differential meter, suitable for the operating pressure specified, shall be provided. The meter shall be complete with hoses, vent, integral metering connections, and carrying case as recommended by the valve manufacturer.
- 3.0 EXECUTION:
- 3.1 Flame Cutting: No cutting by torch shall be done without authorization from the Authorized Member Representative. Where flame cutting is authorized, at least one person shall be standing by exclusively with a fire extinguisher within 10 feet of the work and within full view of the area. The fire extinguisher shall have been inspected and certified by a licensed service agency within the last 12 months.
- 3.2 Welding: All welding shall be performed in compliance with ANSI B31.1 and/or ASME Boiler and Pressure Vessel Code Section IX, as applicable.
- 3.3 Restoration: All disturbed pavement, sodding, soil, and other objects shall be restored to match original condition. Pavement shall be restored with material to maintain the same load bearing capacity as the original.

**Piping Accessories**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of piping accessories. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Filters: Pressure-temperature rating and filter medium particle size retention rating of the replacement filter shall equal or exceed the ratings of the existing filter. Pressure drop at the required capacity shall not exceed that of the replaced filter. Filters shall be constructed in accordance with ASME Code where applicable.
- 2.2 Strainers shall comply with Fed. Spec. WW-S-2739.
  - 2.2.1 Low pressure Y-type strainers shall have Type 304 stainless steel screens. Bodies of threaded or flanged strainers shall be cast iron. Bodies of butt-weld end strainers shall be Schedule 40 cast carbon steel.
  - 2.2.2 High pressure Y-type strainers shall comply with ASME Code if applicable. Strainers shall have Type 304 stainless steel screens. Bodies of threaded or flanged strainers shall be cast iron. Bodies of butt-weld end strainers shall be Schedule 80 cast carbon steel.
- 2.3 Traps shall be in accordance with Fed. Spec. WW-T-696, and steam traps shall comply with ASME Code where applicable.
  - 2.3.1 Thermostatic traps shall be constructed of cast brass. Thermostatic element valve cone shall be stainless steel.
  - 2.3.2 Float and thermostatic traps shall have body and cover constructed of cast iron or semi-steel. Thermostatic element shall have stainless steel valve cone and valve seat. Provide stainless steel or seamless copper float.
  - 2.3.3 Inverted bucket traps shall have body and cover constructed of cast iron or semi-steel. Bucket shall be brass or stainless steel, with lever mechanism of heat-treated stainless steel.
  - 2.3.4 Thermodynamic traps shall have body and cover constructed of stainless steel. Disc shall be heat-

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- treated stainless steel.
- 2.4 Expansion joints shall comply with standards of the Expansion Joint Manufacturer's Association (EJMA). Replacement expansion joints shall equal or exceed the pressure-temperature ratings of the replaced expansion joint.
    - 2.4.1 Expansion compensators shall have 2 ply phosphor bronze bellows, brass shrouds, and end fittings for copper piping systems, or 2 ply stainless steel bellows, carbon steel shrouds, and end fittings for steel piping systems.
    - 2.4.2 Rubber expansion joints shall be constructed of duck and butyl rubber with full-faced integral flanges, internally reinforced with steel retaining rings.
    - 2.4.3 Slip joints shall comply with MIL-E-17814 and shall be of the type designed for repacking under pressure.
    - 2.4.4 Flexible ball pipe joints shall be designed for 360 degree rotation, with minimum of 30 degree angular flexing movement for sizes 1/4 inch to 6 inches, 15 degrees for sizes 8 inches and larger. Certify carbon steel joints for environmental shock testing in accordance with MIL-S-4456 or MIL-S-901C. Joints shall comply with Section II of ASME Boiler and Pressure Vessel Code and ANSI B31.1 Power Piping for materials and design of pressure-containing parts and bolting.
    - 2.4.5 Expansion joints for grooved piping shall be combination couplings and nipples constructed of cut grooved short pipe nipples and couplings, or slip-type expansion joints constructed of carbon steel pipe and couplings.
  - 2.5 Pipe Supports: Pipe supports shall comply with MSS SP-58 and SP-69. Contact between dissimilar metals shall be prevented in supporting copper tubing. Those portions of pipe supports that contact the tubing shall be copper-plated, rubber- or vinyl-coated, or stainless steel. All pipe supports located in sewage wetwells shall be 18-8 stainless steel.
  - 2.6 Valve boxes shall be of cast iron, extension sleeve type; shall be not less than 5 inches in diameter; shall have a minimum thickness at any point of 3/16 inch; and shall be provided with cast-iron bases and covers. Covers shall have cast thereon an appropriate name designating the service for which the valve is used. All parts of valve boxes, bases, and covers shall be coated by dipping in bituminous varnish.
  - 2.7 Flexible Hoses:
    - 2.7.1 Flexible hoses for non-ferrous piping shall be bronze hose covered with bronze wire braid with copper tube ends or bronze flanged ends, braze-welded to hose.
    - 2.7.2 Flexible hose for ferrous piping shall be stainless steel hose covered with stainless steel wire braid with NPT steel nipples or 150 psi ANSI flanges, welded to hose.
    - 2.7.3 Rubber flexible hoses shall be rubber and butyl construction with integral full-faced duck and butyl flanges, internally steel wire reinforced, and furnished complete with steel retaining rings.
  - 3.0 EXECUTION:
    - 3.1 Flame Cutting: No cutting by torch shall be done without authorization from the Authorized Member Representative. Where flame cutting is authorized, at least one person shall be standing by exclusively with a fire extinguisher within 10 feet of the work and within full view of the area. The fire extinguisher shall have been inspected and certified by a licensed service agency within the last 12 months.
    - 3.2 Restoration: All disturbed pavement, sodding, soil, and other objects shall be restored to match original condition. Pavement shall be restored with material to maintain the same load bearing capacity as the original.
    - 3.3 Welding: All welding shall be performed in compliance with ANSI B31.1 and with ASME Code Section IX where applicable.
    - 3.4 Y-type strainers shall be located in supply line ahead of the following equipment if integral strainer is not included in equipment.
      - a. Pumps.
      - b. Steam traps serving steam main drips.
      - c. Temperature control valves.
      - d. Pressure reducing valves.
      - e. Temperature or pressure regulating valves.
    - 3.5 Installation of Steam Traps: Install strainer ahead of trap if not integral with trap.

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- 3.6 Pipe Support Installation: Concrete inserts or L-shaped anchor bolts shall be used to support piping from new cast-in-place concrete. Expansion anchors shall be used to fasten supports to existing concrete and masonry.
- 3.7 Valve boxes shall be set plumb. Each valve box shall be placed directly over the valve it serves, with the top of the box brought flush with the finished grade. After being placed in proper position, earth shall be filled in around each valve box and thoroughly tamped on each side of the box.
- 3.8 Flexible hoses shall be installed on equipment side of shutoff valves, horizontally and parallel to equipment shafts wherever possible.

**Pumps**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of pumps. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Worn or damaged pump parts shall be replaced rather than repaired.
  - 2.2 New pump impellers, when required, shall be statically balanced before installation.
  - 2.3 Used impellers shall be checked for balance before reinstallation. Out of balance impellers shall either be balanced or replaced.
  - 2.4 Close coupled pumps, when replaced, shall be replaced complete with motor.
- 3.0 EXECUTION:
  - 3.1 Before any work is started, the pump driver shall be locked out and tagged to prevent any driving power to the pump. The pump suction and discharge piping shall be valved off, locked, and tagged, or pipe line blanks shall be installed.
  - 3.2 Before any work is performed on pumps in acid or other toxic material service, the pump must be vented and drained (flushed, if possible). Acid-proof personal protection shall be worn until pump and parts have been cleaned and neutralized.
  - 3.3 Gaskets shall be replaced whenever a gasketed joint has been disturbed.
  - 3.4 Flexible coupling alignment shall be required if either the pump or motor mounting has been disturbed and shall be to the tolerances specified by the flexible coupling manufacturer.
  - 3.5 Removal and installation of impellers shall be accomplished using pullers, jacks, crane, or hoist. Impact tools are strictly prohibited.
  - 3.6 Turbine pumps removed from casings shall be lifted vertically to prevent damage to the pump or the pump casing.
  - 3.7 New impeller rings, gaskets, and strainers shall be installed before reassembly of turbine pumps.
  - 3.8 Relief valve in discharge line for positive displacement pumps shall be set and tested at 110 percent of design discharge pressure or as recommended by pump manufacturer for service in which pump is used.

**Insulation for Above Ground Pipe**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of insulation for aboveground pipe. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Insulation shall be in accordance with the following.
    - Service Temperature, F Insulation Material
    - 3,000 Maximum Fiber Blanket, ASTM C 892
    - 1,600 Maximum Calcium silicate, ASTM C 533
    - 1,500 Maximum Expanded perlite, ASTM C 610
    - 1,200 Maximum Preformed mineral fiber, ASTM C 547
    - 800 Maximum Cellular glass, ASTM C 552
    - 225 Maximum Rigid, preformed cellular urethane, ASTM C 591

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- 60 F and below Cellular glass, ASTM C 552 (cold piping) or mineral fiber, Fed. Spec. HH-I-558
- 2.2 Insulation jacket materials shall have fire hazard ratings that do not exceed 75 for flame spread and 150 for fuel contributed and smoke developed, except where otherwise required by the authority having jurisdiction. Test ratings shall be determined in compliance with ASTM E 84 and NFPA 255.
  - 2.3 Accessory materials, including insulating cements, adhesives, staples, coatings, tapes, bands, and other accessory materials shall be as recommended for the particular application by the manufacturer of the insulation or jacket.
  - 3.0 EXECUTION: Vapor barrier shall be continuous throughout each piping run for cold piping (-30 F to 60 F).

**Insulation for Underground Pipe**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of insulation for underground pipe. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Insulation for conduit systems shall be calcium silicate complying with ASTM C 533 or polyurethane foam for low temperature systems (250 F and below).
  - 2.2 Insulation jackets for conduit systems shall be cast iron complying with ASTM A 377 or epoxy-coated spiral weld steel conduit for high temperature systems (above 250 F); or shall be polyvinyl chloride complying with ASTM D 1785 or fiberglass reinforced plastic for low temperature systems (250 F and below).
- 3.0 EXECUTION:
  - 3.1 Backfill on pipe system shall be 12 inches minimum.
  - 3.2 Ground surface shall be resodded or otherwise restored to the condition existing prior to the work.

**Boiler Firebox Insulation**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of boiler firebox insulation. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Block or Board Insulation:
    - 2.1.1 Mineral Fiber Rock, Slag, or Glass in accordance with ASTM C 612.
    - 2.1.2 Fiber blanket, ASTM C 892.
    - 2.1.3 Calcium Silicate in accordance with ASTM C 533.
    - 2.1.4 Cellular Glass in accordance with ASTM C 552.
    - 2.1.5 Cellular Polyurethane in accordance with ASTM C 591.
    - 2.1.6 Expanded Perlite in accordance with ASTM C 610.
  - 2.2 Blanket Insulation: Mineral fiber rock, slag, or glass in accordance with ASTM C 553 or ASTM C 592.
  - 2.3 Loose Fill Insulation:
    - 2.3.1 Mineral Fiber Rock, Slag, or Glass in accordance with ASTM C 764.
    - 2.3.2 Vermiculite in accordance with ASTM C 516.
    - 2.3.3 Perlite in accordance with ASTM C 549.
  - 2.4 Insulating Cement:
    - 2.4.1 Mineral Fiber Rock, Slag, or Glass in accordance with ASTM C 195 or ASTM C 449.
    - 2.4.2 Exfoliated Vermiculite in accordance with ASTM C 196.
  - 2.5 Castable Refractory in accordance with ASTM C 401.
  - 2.6 Spray-Applied Fibrous Insulation in accordance with ASTM C 720 and ASTM C 762.
  - 2.7 Refractory Supports attached to pressure parts of the boiler shall comply with the ASME Boiler and

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Pressure Vessel Code.

3.0 EXECUTION:

- 3.1 Safety: The boiler shall be removed from service, cooled, drained, and purged prior to conducting internal inspection or repairs. No personnel shall enter the boiler until the atmosphere in the boiler has been checked and found to be free of toxic, explosive, or suffocating gases.
- 3.2 Closing up the Boiler: The repair shall not be covered by replaced or reinstalled materials until authorized.

**Ductwork Insulation**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of ductwork insulation. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Rigid fiberglass ductwork insulation shall conform to Fed. Spec. HH-I-558, Form A. It shall consist of rigid fibrous glass board with foil facing, vapor sealed and attached to ducts with mechanical fasteners. Density shall be 3 lb/ft<sup>3</sup>.
  - 2.2 Flexible fiberglass ductwork insulation shall conform to Fed. Spec. HH-I-558, Form B. It shall consist of 3/4 lb/ft<sup>3</sup> density fibrous glass blanket with reinforced foil and Kraft facing lapped and joints sealed vapor tight.
  - 2.3 Ductwork insulation shall have a flame spread rating not exceeding 75 and a smoke developed rating not exceeding 150 as determined by test procedures in ASTM E 84. Components such as adhesives, mastics, and cements must meet the same individual ratings as the minimum requirements.
  - 2.4 Adhesives shall conform to Mil. Spec. MIL-A-3316.
  - 2.5 Vapor barrier shall conform to ASTM C 1136 Type I for exposed ducts and Type I or Type II for concealed ducts.
- 3.0 EXECUTION: Insulation shall be installed so that finishes are smooth and all joints are tight and sealed.

**Interior Plumbing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of interior plumbing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work. Contact the Fire Protection Engineering Branch for requirements of piping material.
- 2.0 PRODUCTS:
  - 2.1 Drinking Water Dispensers:
    - 2.1.1 Electric water coolers shall comply with ARI 1010 and shall use one of the halogenated hydrocarbons as refrigerant. Top surfaces of the dispenser in contact with water shall be stainless steel or porcelain enameled steel. Piping connections from the shutoff or stop valve and outlet valve arrangement shall be chrome-plated brass, copper tubing, or stainless steel.
    - 2.1.2 Drinking fountains shall comply with Fed. Spec. WW-P-541/6.
  - 2.2 Hot Water Generators and Storage Tanks:
    - 2.2.1 Heating element for the hot water generator shall consist of U-bend coils, a tube sheet, and air element head. The coil shall be seamless tubing inserted into holes in the tube sheet and secured by expanding. The tube sheet shall be copper alloy or other nonferrous metal. Tubing for the heating element shall be light drawn copper tubing complying with ASTM B 75 or copper alloy tubing complying with ASTM B 111, copper alloy No. 706. Element shall be in accordance with Mil. Spec. MIL-H-12322.
      - 2.2.1.1 Copper tubing shall be designed for a working pressure of 150 psig steam and shall withstand an internal hydrostatic pressure of 225 psig for not less than 15 seconds without leaking or any

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- evidence of damage.
- 2.2.1.2 Copper alloy tubing shall be designed for a working pressure of 400 psig with 400 F hot water and shall withstand an internal hydrostatic pressure of 600 psig for not less than 15 seconds without leaking or any evidence of damage.
  - 2.2.1.3 The head for the heating element shall be close grained cast iron or fabricated steel for steam service, or cast or fabricated steel for high temperature hot water service. The heads shall be partitioned to separate the steam supply and condensate return. The head shall be equipped with tappings or flanges for the supply, return, air relief, and vacuum breaker connections. The air-relief valve and vacuum breaker connection shall be 1/2 inch pipe size.
  - 2.2.2 New storage tanks shall be constructed, tested, and marked in compliance with the ASME Boiler and Pressure Vessel Code, Section VIII. The tank shall be glass-lined steel. Tanks shall be cathodically protected if required by local conditions. Tanks shall be in accordance with Mil. Spec. MIL-T-12295. The thermal efficiency and standby heat loss shall comply with the requirements of ASHRAE 90A.
  - 2.2.3 Storage tank repair shall comply with the ASME Boiler and Pressure Vessel Code, Section VIII.
  - 2.2.4 Heaters/storage tanks shall be equipped with ASME rated accessories.
  - 2.3 Pneumatic Water Supply Systems:
    - 2.3.1 New pneumatic tanks shall be designed for 125 psig working pressure and shall be constructed in compliance with ASME Boiler and Pressure Vessel Code, Section VIII. Tanks shall be equipped with manhole in head, water gauge glass, pressure gauges, water pressure relief valves, and tapped openings for all piping.
    - 2.3.2 Compressor shall be belt-driven by a motor having a maximum speed of 1800 rpm. The motor shall have a manual across-the-line starter and thermal overload protection. Guards complying with OSHA requirements shall be provided for all exposed moving parts.
    - 2.3.3 Control System: Pressure switches shall be of the adjustable type having an operating range of 30 to 90 psig. The switch shall be three position type.
    - 2.3.4 Bladder-Type Pneumatic Tank: An ASME code constructed tank stamped for 125 psig water working pressure shall be provided, unless otherwise indicated. The tank shall be sized as indicated and have a flexible diaphragm made of material conforming to FDA requirements for use with potable water and shall be factory precharged to meet required system pressure.
  - 2.4 Gas Fired Water Heaters:
    - 2.4.1 Water heater storage tank shall be steel with a copper or glass lining and shall comply with ANSI Z21.10.1. Equipment shall comply with the approval requirements of AGA Directory of Certified Appliances and Accessories. For elevations above 2,000 feet, the AGA rating shall be reduced at the rate of 4 percent for each 1,000 feet above sea level. Safety pilot valve shall be supplied to automatically shut off the main gas supply to the burner or burners in the event that the pilot flame is extinguished.
    - 2.4.2 Flue gas piping shall be single wall metal pipe constructed of not less than No. 24 B&S gauge sheet copper or No. 20 gauge galvanized sheet steel.
    - 2.4.3 Relief valves shall comply with ANSI Z21.22. Relief valves shall be ASME rated.
    - 2.4.4 Thermostat shall be snap action type actuated by water temperature.
  - 2.5 Oil Fired Water Heaters:
    - 2.5.1 Water heater tank shall be glass-lined steel. Tanks of 120-gallon capacity, or less, shall be hydrostatically tested to 300 psig. Tanks shall have vertical flue passages or annular flue passages between the tank and the casing. Tanks shall be cathodically protected if required by local conditions.
    - 2.5.2 Burner shall be mechanical pressure atomizing type.
    - 2.5.3 Controls shall consist of a combustion safeguard (primary control) to shut down the burner in event of ignition failure or flame failure, a limit control to prevent overheating in case of thermostat failure, and a thermostat of the adjustable immersion type to control water temperature.
    - 2.5.4 Relief valve shall comply with ANSI Z21.22. Relief valves shall be ASME rated.
    - 2.5.5 Draft regulator shall be of the automatic, barometric type designed for installation in the chimney or flue connector at the outlet of the water heater. The draft regulator shall meet the requirements of UL 378.

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- 2.5.6 Flue gas piping shall be single wall steel pipe, minimum 28 gauge. Finish shall be zinc coated or oxidized to form blue black color.
- 2.6 Electric Water Heaters:
  - 2.6.1 Water heater tanks shall be glass-lined steel complying with Fed. Spec. W-H-196, with dual heating elements. Tanks shall be cathodically protected if required by local conditions.
  - 2.6.2 Relief valves shall comply with ANSI Z21.22. Relief valves shall be ASME rated.
  - 2.6.3 Thermostats shall be provided in compliance with UL 174.
  - 2.6.4 Wiring shall comply with NFPA 70.
  - 2.6.5 Heating elements shall be medium watt density commercial grade incoloy sheathed flanged mounted elements with prewired terminal leads, and element fusing per the National Electrical Code.
- 2.7 Lavatories:
  - 2.7.1 Lavatories shall be first quality vitreous china or enameled cast iron.
  - 2.7.2 Drains and jam nuts shall be cast wrought copper alloy. Strainer shall be copper alloy or corrosion-resisting steel.
  - 2.7.3 Faucets shall be single, center set, combination, or single control mixing type, complying with Fed. Spec. WW-P-541/4.
  - 2.7.4 Stop valves shall be angle or straight type and constructed of copper alloy, chrome plated.
  - 2.7.5 Traps shall be P-type.
  - 2.7.6 Soap dispensers shall be glass or metal type with a capacity of 12 fluid ounces for liquid soap.
- 2.8 Urinals:
  - 2.8.1 Wall-hung urinals shall have integral trap and extended shield; shall have washout, blowout, or siphon-jet flushing action; and shall be constructed of first quality vitreous china.
  - 2.8.2 Pedestal type urinals shall have integral trap, siphon-jet flushing action, and a bottom outlet for connection to a closet type floor flange. Urinal shall be constructed of first quality vitreous china.
  - 2.8.3 Trough type urinals shall be wall-hung with an integral flushing rim and shall be constructed of first quality vitreous china.
- 2.9 Water Closets:
  - 2.9.1 Elongated bowl water closets shall be of the siphon jet, floor outlet type, for use with a flush valve and constructed of first quality vitreous china. Seats shall be open front, less cover, constructed of molded plastic or wood.
  - 2.9.2 Regular bowl water closets shall be of the siphon jet, floor outlet type, constructed of first quality vitreous china. The tank shall be separate, secured to and supported by the water closet and shall contain a copper, copper alloy, or corrosion-resisting steel float and flush valve with a refill tube, operating lever, and control valve stop and supply pipe. Seats shall be closed front, with cover constructed of molded plastic or wood.
  - 2.9.3 Fittings: Floor flanges, gaskets, bolts, and screws shall be supplied. Flanges may be copper, copper alloy, or cast iron. Gaskets shall be nonstaining wax.
- 2.10 Sinks:
  - 2.10.1 Kitchen sink shall be single or double bowl enameled cast iron, porcelain enameled formed steel, or corrosion-resisting formed steel.
  - 2.10.2 Service sink shall be single bowl, trap standard, floor or wall mounting. Sink shall be constructed of enameled cast iron or vitreous china. Rim guard shall be copper alloy or corrosion-resisting steel.
  - 2.10.3 Faucets shall be a single center set or combination type complying with Fed. Spec. WW-P-541/5. Vacuum breaker shall be provided on faucets where required by codes. Handicapped faucets shall be provided with lever or wrist blades.
  - 2.10.4 Drains shall have a removable metal strainer, jam nut, coupling, and tail piece.
  - 2.10.5 Traps for kitchen sinks shall be P-type chrome plated. Exterior surfaces of traps for service sinks shall be as cast or painted.
- 2.11 Bathtubs shall be enameled cast iron or porcelain enameled formed steel in compliance with Fed. Spec. WW-P-541/3 or shall be fiberglass reinforced plastic. Drains shall be chrome-plated with pop-up or trip lever stopper.
- 2.12 Laundry Tubs:
  - 2.12.1 Laundry Tubs shall be double bowl enameled cast iron or corrosion-resisting formed steel with

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- frame, wall, pedestal, or leg support.
- 2.12.2 Faucet shall be mounted in back of tub and shall be a separate or combination fitting. Combination faucet shall have exposed valve body, union inlet, and swing spout. Finish shall be chrome or nickel plated. Vacuum breakers shall be provided on faucets where required by codes.
- 2.12.3 Drain shall have a removable metal strainer, jam nut, coupling, and tail piece. Drain shall have a suitable rubber type stopper.
- 2.12.4 Trap shall be P-type with cleanout plug and shall be chrome-plated.
- 2.13 Flush Valves: Flush valve shall be a large diaphragm or large piston type exposed style with a side oscillating handle. The flush valve shall have a vacuum breaker; a control stop with or without a cap; a back check in the control stop with or without a cap; a back check in the control stop or anti-siphon within the valve; a flush connection with coupling nuts, gaskets, and spud flanges; and a wall flange or escutcheon. Exposed surfaces of the flush valve shall have a bright chrome-plated finish. The valve shall be capable of operating without chatter or water hammer and shall deliver 2 gallons minimum for urinals and 4 gallons minimum for water closet per flush at any inlet pressure from 10 psi to 50 psi.
- 2.14 Showers shall be wall mounted, column, bath, free standing cabinet, or emergency type complying with Fed. Spec. WW-P-541/7. Shower heads and handles shall be copper alloy or corrosion-resisting steel. Escutcheons shall be corrosion-resisting steel or copper alloy. Control valves shall be copper alloy and have metal integral parts of copper alloy, nickel alloy, or corrosion-resisting steel. Control valves shall be thermostatic mixing; pressure balancing; mechanical, either mixing or single control; or separate hot and cold water valves. Shower heads shall be nonadjustable.
- 2.15 Floor Drains:
- 2.15.1 Cast-iron drains shall comply with ANSI A112.21.1, Figure 3.3. Body shall be cast iron and strainer shall be chrome-plated bronze.
- 2.15.2 Polyethylene drains shall be constructed of polyethylene complying with ASTM D 1248.
- 2.15.3 Gaskets shall be neoprene complying with ASTM C 564 or as recommended by the drain manufacturer.
- 2.16 Wall Faucets: Provide faucets with vacuum breaker, backflow preventer, brass body, 3/4-inch male inlet threads, hexagon shoulder, and 3/4-inch hose connection. Faucet handle shall be securely attached to stem.
- 2.17 Wall Hydrants: Provide hydrants with vacuum breaker, backflow preventer, nickel-brass or nickel-bronze wall plate, and detachable key handle. Hydrant shall be self-draining and have 3/4-inch exposed hose thread on spout.
- 2.18 Lawn Faucets: Provide faucets with either straight or angle brass bodies, and shall be of the compression type. Faucet spout shall have 3/4-inch hose threads, and handle shall be securely attached to stem.
- 2.19 Yard Hydrants: Yard box or post hydrants shall have valve housings located below frost lines. Hydrants shall be bronze with cast-iron box or casing guard. "T" handle key shall be provided.
- 2.20 Backwater Valves: Valves shall be of the flap type, hinged or pivoted, with revolving disks. Hinge pivots, disks, and seats shall be nonferrous metal.
- 3.0 EXECUTION:
- 3.1 Installation of new equipment and repair of existing equipment shall comply with NAPHCC National Standard Plumbing Code. Mounting height of fixtures for use by the physically handicapped shall be in accordance with ANSI A117.1.
- 3.2 Repair of the pneumatic pressure tank shall comply with ASME Boiler and Pressure Vessel Code, Section VIII.
- 3.3 Testing of Repaired Tanks: After repairs have been completed, hot water generator storage tanks and pneumatic pressure tanks shall be tested in compliance with ASME Boiler and Pressure Vessel Code, Section VIII.
- 3.4 Flue Gas Piping: New flue gas piping shall be installed in compliance with NFPA 211. New flue gas vent piping shall be installed in compliance with NFPA 54.
- 3.5 Faucet repair shall be limited to replacement of washers, renewable seats, or broken handles.
- 3.6 Air chambers for prevention of water hammer shall be checked to see if they are waterlogged.

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**Steel Tanks**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of steel tanks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Tank materials shall be as required for the service by AWWA D100 or D103 for water tanks, or by API standards for petroleum product tanks.
  - 2.2 New tanks shall comply with AWWA or API standards as applicable for the service. Storage tanks for flammable liquids shall also comply with UL and NFPA requirements.
  - 2.3 Nozzle flange diameters and drillings shall be in compliance with ANSI B16.5.
  - 2.4 Butt weld nozzles shall be in compliance with ANSI B16.25.
- 3.0 EXECUTION:
  - 3.1 Tank repair and installation work shall comply with applicable requirements of AWWA D100 or D103, or with API standards.
  - 3.2 Welding shall be performed in accordance with AWS D1.1. Pipe welding to nozzles shall be performed in accordance with ASME Boiler and Pressure Vessel Code, Section IX.

**Plastic Tanks**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of plastic tanks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Tank material shall be reinforced fiberglass polyester in compliance with AWWA D120 for water tanks, or ASTM C 582 for tanks in chemical service. 2.2 New Tanks shall be horizontal, cylindrical tanks and shall comply with AWWA D120 or ASTM D 3299 as applicable. Chemical resistance tests, when required, shall be performed at the fabrication shop in compliance with ASTM C 581.
  - 2.3 Nozzle flange diameters and drillings shall be in compliance with ANSI B16.5.
- 3.0 EXECUTION: Repair and installation work shall be performed in compliance with recommended procedures and practices of SPII and of PPI, where applicable.

**Pool Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of pool equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Electric swimming pool heaters shall be UL listed and shall conform to the ASME Boiler and Pressure Vessel Code. The heating elements shall be constructed of copper and shall be pre-wired with the connection at the element terminal sealed against moisture. Controls shall include a differential thermostat and a high temperature limit manual reset switch.
  - 2.2 Gas-Fired Swimming Pool Heaters shall conform to the ASME Code and shall be approved by the American Gas Association. Heat exchangers shall be two-or four-pass design with copper-finned tubes. The burner shall be constructed of stainless steel and shall be provided with all necessary valving to meet ASME Code requirements.
  - 2.3 Diatomite filtration system shall consist of a centrifugal circulating pump, plastic filter elements surrounded by diatomaceous earth coating, a dry chemical feeder for feeding diatomaceous earth, and a modulating level control valve for the filter inlet line.
  - 2.4 Swimming pool chlorinators shall be the gaseous chlorine cylinder-mounted type. Materials for construction of chlorinators shall be in accordance with recommendations of the Chlorine Institute.
  - 2.5 Swimming pool surge tank system shall include a surge tank, a vertical pump, and an electronic float switch. The surge tank shall be in compliance with ASME Code requirements for unfired

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- pressure vessels.
- 2.6 Pool drains shall be constructed of cast iron.
- 3.0 EXECUTION:
- 3.1 Personnel shall not begin repairs on the electric swimming pool heater until power to the heater has been disconnected.
- 3.2 Chlorine gas storage and use shall be in accordance with recommendations of the Chlorine Institute Inc., Chlorine Manual.

**Compressed Air Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of compressed air equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 All new compressed air equipment and materials for repair or replacement shall comply with ANSI/ASME B19.3, and ASME Boiler and Pressure Vessel Code, Section VIII.
  - 2.2 New reciprocating air compressors shall be of the single or two-stage, heavy-duty, double-acting, water-cooled or air-cooled, "Y" or "L" cylinder type complete with flange-mounted drive motor. The piston, valve, and cylinder construction shall not require lubrication. Teflon piston rings and Teflon or carbon rider rings shall be used. Compressors shall operate at a speed not in excess of 1,800 rpm.
    - 2.2.1 Bearings: Main crankshaft bearings shall be anti-friction roller or ball type. Connecting rod bearings shall be sleeve type.
    - 2.2.2 Valves: Compressor cylinder valves shall be of the channel, feather, or plate type suitable for service without external lubrication.
    - 2.2.3 Lubrication: Force-feed lubrication system shall lubricate the crankshaft, connecting rod, and crosshead bearings.
    - 2.2.4 Rod Packing: Piston rod packing shall be Teflon or carbon non-lubricating type.
    - 2.2.5 Intake air filter - silencer shall be a pipe-supported dry type capable of removing 95 percent of all particles 10 microns and larger.
    - 2.2.6 Intercooler and after cooler shall be a shell-and-tube or plate type.
    - 2.2.7 Motor shall be squirrel-cage induction, drip-proof, NEMA Class B, with split-sleeve bearings.
  - 2.3 New centrifugal and rotary screw compressors shall be of the multi-stage or two-stage type driven by an electric motor through speed-increaser gears.
    - 2.3.1 Intake air filter-silencer shall be a full-capacity dry type capable of removing 95 percent of all particles 10 microns and larger.
    - 2.3.2 Blowoff silencer shall be a full-capacity blowoff vent type.
    - 2.3.3 Bearings: Centrifugal compressor radial bearings shall be of the pivoted shoe type. Axial bearings shall be Kingsbury-type thrust bearings capable of absorbing thrust in either direction. Rotary screw compressor radial bearings shall be anti-friction roller type. Ball thrust bearings shall be provided to carry the axial load.
    - 2.3.4 Seals: Centrifugal compressors shall be labyrinth or carbon ring-type air and oil seals. Rotary screw compressors shall be stainless steel sealing rings.
    - 2.3.5 Intercoolers and after coolers shall be water-cooled shell and tube type.
    - 2.3.6 Vents and Drains: Vents shall be tapped and plugged. Drains shall be complete with drain valves.
    - 2.3.7 Lubricating oil system shall be a shaft-driven main oil pump, motor-driven auxiliary oil pump, dual oil coolers, oil reservoir, dual oil filters, pressure switches and gauges, check valves, valves, and interconnecting piping.
    - 2.3.8 Check valves shall be 150-pound class, carbon steel.
  - 2.4 New control air compressor and dryer shall be air-cooled with a reciprocating compressor and a single receiver constructed in accordance with ASME Code requirements. Motor shall be NEMA Class B design with built-in overload protection. Unit shall include an air gauge, pop safety valve, external check valve, filter, pressure switch, and drain cock. Air dryer shall be refrigerated type

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- designed for continuous operation with hermetically sealed compressor, heat exchanger, ambient air filter, and automatic drain trap. Oil and water filter shall have aluminum housing with pressure rating of 250 psig at 70 F and include manual drain valve and 10 replacement filters.
- 2.5 Aftercoolers shall be of the watercooled, shell-and-tube pipeline type with adequate surface area to limit the discharge to the temperature required. The unit shall include moisture separators, gauge glasses, automatic condensate traps, valves, drain piping, and thermal reliefs on the water side.
  - 2.6 Receivers shall meet ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 requirements and shall include pressure gauge, relief valve, shutoff valve, automatic moisture trap, and drain valve. Receivers shall be designed for 200 psi.
  - 2.7 All rotating parts and equipment shall be true, dynamically balanced at the factory, and shall include vibration isolators.
  - 2.8 Safety guards shall meet OSHA requirements.
  - 2.9 Pressure regulators shall be designed for a maximum inlet pressure of 125 psi and a maximum temperature of 200 degrees F. Regulators shall be single seated, pilot-operated with valve plug, bronze body and trim, and threaded connections. Regulator shall include a pressure gauge.
  - 3.0 EXECUTION:
  - 3.1 Repair and replacement work done on receiver tanks shall be in accordance with ASME Boiler and Pressure Vessel Code and the NBBI. Repair procedures shall provide structural integrity as required by NB-23.
  - 3.2 Welding shall be performed in compliance with AWS D1.1 and ASME Boiler and Pressure Vessel Code, Section IX.
  - 3.3 Repaired pressure parts and replacement pressure parts shall be tested after completion of repair or installation in accordance with the ASME Code.

**Fire Tube Boilers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of fire tube boilers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Replacement parts and materials shall comply with requirements of the ASME Boiler and Pressure Vessel Code for new construction.
- 3.0 EXECUTION:
- 3.1 No personnel shall enter the boiler until the boiler has been removed from service, cooled, drained, and purged and the atmosphere in the boiler has been checked and found to be free of toxic or explosive gases.
- 3.2 Repair and maintenance work shall be performed in accordance with procedures developed by the Contractor that are in compliance with requirements of the ASME Boiler and Pressure Vessel Code and the NB-132 and have been approved by the Authorized Member Representative.
- 3.3 Waterside Repairs: Wash drum internals to remove loose scale and soft deposits prior to making repairs.
- 3.4 Fireside Repairs:
  - 3.4.1 Remove soot and other deposits from furnace tube, fire tubes, and tube sheets.
  - 3.4.2 Cracks at the junction of the furnace tube and tube sheet shall be repaired by welding.
  - 3.4.3 Boiler shell and tube sheet patches shall be designed and installed in compliance with the National Board Inspection Code Chapter VI. All patches shall comply with the requirements for new construction of ASME Boiler and Pressure Vessel Code, Section I or IV.
  - 3.4.4 Damaged fire tubes shall be removed and replaced with new tubes, except for a single leaking fire tube, which may be repaired by plugging at tube sheet at both ends.
  - 3.4.5 Corroded surfaces may be built up by fusion welding in compliance with the NBBI National Board Inspection Code.
  - 3.4.6 Seal welds used for fluid tightness shall be applied in compliance with NB-132.
- 3.5 Closing the Boiler:
  - 3.5.1 Manholes, Handholes, and Gaskets: Clean seating surfaces, replace old gaskets with new gaskets,

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and reinstall or close all manholes and handholes.

- 3.5.2 Front and Rear Door: Clean seating surface, replace gaskets, and close front and rear access doors.
- 3.5.3 The repair shall not be covered by replaced or reinstalled materials until authorized.
- 3.6 Inspection and testing of completed boiler repairs shall be in compliance with the ASME Code.

**Water Tube Boilers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of water tube boilers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Replacement parts and materials shall comply with requirements of the ASME Boiler and Pressure Vessel Code for new construction.
- 3.0 EXECUTION:
  - 3.1 No personnel shall enter the steam drum or lower drum until the boiler has been removed from service, cooled, drained, and purged and all steam and water valves, including drain and blowdown valves, have been closed, and locked or tagged. No personnel shall enter the boiler until the atmosphere in the boiler has been checked and found to be free of toxic or explosive gases.
  - 3.2 Repair and maintenance work shall be performed in accordance with procedures developed by the Contractor that are in compliance with requirements of ASME Boiler and Pressure Vessel Code and the NB-132 and have been approved by the Authorized Member Representative.
  - 3.5 Waterside (Internal) Repairs: Wash drum internals to remove loose scale and soft deposits. Turbine the water tubes. Perform chemical cleaning by either circulation or soaking.
  - 3.6 Cracks in drums shall be repaired in compliance with the NBBI National Board Inspection Code.
  - 3.7 Tube seat leaks may be repaired by internal seal welding of the tubes in compliance with NB-132.
  - 3.8 Fireside (External) Repairs:
    - 3.8.1 Clean deposits from fireside surfaces by washing with hot alkaline water, brushing, scraping, or air lancing. Surfaces shall be dried immediately after washing.
    - 3.8.2 Corroded surfaces may be built up by fusion welding in compliance with NB-132, Chapter VI.
    - 3.8.3 Drum shell patches shall be designed and installed in compliance with NB-132.
    - 3.8.4 Minor cracks in tube shall be repaired by replacement of a tube section. Minimum length of replacement tube section shall be 12 inches. Use backing rings when sections are welded into existing tubes. Use the TIG (tungsten-inert-gas) process for the root pass.
    - 3.8.5 For major tube damage, replace entire tube. If only one or two tubes require replacement, the damaged tubes may be removed and the holes plugged if approved by the Authorized Member Representative.
    - 3.8.6 Seal welds used for fluid tightness shall be applied in compliance with NB-132.
  - 3.9 Closing the Boiler:
    - 3.9.1 Manholes, Handholes, and Gaskets: Clean seating surfaces, replace old gaskets with new gaskets, and reinstall or close all manholes and handholes.
    - 3.9.2 The repair shall not be covered by replaced or reinstalled materials until authorized.
- 3.10 Inspection and testing of completed boiler repairs shall be in compliance with the ASME Code.

**High Temperature Water Boilers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of high temperature water boilers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Replacement parts and materials shall comply with requirements of the ASME Boiler and Pressure Vessel Code for new construction.
- 3.0 EXECUTION:
  - 3.1 Personnel shall not enter the boiler until it has been removed from service, cooled, drained, and purged.

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- 3.2 Repair and maintenance work shall be performed in compliance with requirements of the ASME Boiler and Pressure Vessel Code and the NBBI National Board Inspection Code, and approved by the Authorized Member Representative.
- 3.3 Tubes shall be replaced as specified in NB-23.
- 3.4 Tube joints, headers, and drums shall be repaired as specified in NB-23.
- 3.5 Material and equipment removed for access to the boiler or to make repairs shall be reinstalled following successful completion of performance tests and authorization of the Authorized Member Representative.
- 3.6 Repairs to pressure parts shall be inspected and tested as specified in NB-23. The Contractor shall submit the Inspection Certificate to the Authorized Member Representative.

**Cast-iron Boilers and Fireboxes**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of cast-iron boilers and fireboxes, and furnishing and installation of cast-iron boilers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Replacement parts and materials shall comply with the requirements of the ASME Boiler and Pressure Vessel Code for new construction.
- 2.1 Gas-Fired, Oil-Fired, and Combination Gas/Oil-Fired Boilers: Boilers shall be rated and tested in accordance with ANSI Z21.13. Boilers shall meet the requirements of the following safety codes and standards: UL 726, UL 795, and UL 296. Boilers shall be provided with combustion controls.
- 3.0 EXECUTION:
  - 3.1 No personnel shall enter the boiler until it has been removed from service, cooled, drained, and purged, and the atmosphere has been checked and found to be free of toxic or explosive gases.
  - 3.2 Repair and maintenance work shall be performed in accordance with procedures developed by the Contractor, in compliance with requirements of the ASME Boiler and Pressure Vessel Code and NB-132, and approved by the Authorized Member Representative.
  - 3.3 Clean Fireside Surfaces: Thoroughly clean flueway and firebox surfaces.
  - 3.4 Clean waterside surfaces to remove sludge and sediment.
    - 3.4.1 On steam boilers, open blowdown valve and flush water until clear while under steam pressure. On water boilers, open boiler drain cock to remove sludge and sediment that have settled to the bottom. Then refill boiler to correct water level for steam boilers or correct water pressure for water boilers.
    - 3.4.2 If boiler is shut down, remove plugs and open drain cock. Wash the inside of the boiler with water to remove sludge and sediment. Fill boiler and drain again. Fill boiler to correct level or pressure.
  - 3.5 Replace Damaged Boiler Section: Clean seating surfaces and replace gaskets or sealant before installing boiler sections.
  - 3.6 Repair cracks by brazing in compliance with the ASME Boiler and Pressure Vessel Code, Section IV and Section IX.
  - 3.7 Closing the Boiler:
    - 3.7.1 Manholes, Handholes, and Gaskets: Clean seating surfaces, replace old gaskets with new gaskets, and reinstall or close all manholes and handholes.
    - 3.7.2 Other Materials: The repair shall not be covered by replaced or reinstalled materials until authorized.
  - 3.8 Inspection and testing of completed boiler repairs shall be in compliance with the ASME Code.

**Cleaning of Boilers**

- 1.0 DESCRIPTION OF WORK: This specification covers cleaning of boilers. Products and materials used shall be in accordance with the boiler manufacturer's recommendations and/or shall be as directed by the Authorized Member Representative. Cleaning procedures shall be developed by the Contractor and shall be in accordance with the boiler manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

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2.0 PRODUCTS:

- 2.1 Equipment required for cleaning, such as acid feed tank and pump, alkaline feed tank and pump, mixer, neutralizer tank and pump, power brushes, high pressure sprays, and other equipment shall be supplied by the Contractor.
- 2.2 Chemical Cleaning Materials:
  - 2.2.1 Boilout chemicals shall be trisodium phosphate complying with ASTM D 538, caustic soda complying with ASTM D 456, and soda ash complying with ASTM D 458.
  - 2.2.2 Acid Cleaning Chemicals shall be:
    - Hydrochloric Acid complying with Fed. Spec. 0-H-765
    - Ammonium Bifluoride, N<sub>2</sub>H<sub>4</sub>F<sub>2</sub>
    - Hydroxycetic Acid, CH<sub>2</sub>OHCOOH, Technical Grade
    - Formic Acid, HCOOH, Technical Grade
    - Phosphoric Acid complying with Fed. Spec. 0-0-670
    - Sulfuric Acid complying with Fed. Spec. 0-S-809
    - Sulfamic Acid, HSO<sub>3</sub>NH<sub>2</sub>
  - 2.2.3 Neutralizing-Passivating Chemicals shall be as follows:
    - Monosodium Phosphate, H<sub>2</sub>NaO<sub>4</sub>P
    - Di-sodium Phosphate, Na<sub>2</sub>HPO<sub>4</sub>
    - Ammonia, Anhydrous, complying with Fed. Spec. 0-A-445
    - Hydrazine, Anhydrous, H<sub>2</sub>NNH<sub>2</sub>
    - Sodium Sulfite complying with Mil. Spec. MIL-S-13943
    - Sodium Nitrate complying with Mil. Spec. MIL-S-322
  - 2.2.4 Flushing water shall be demineralized water with a conductivity end point of 50 micro-ohms.
  - 2.2.5 Pressure draining gas shall be commercially pure, 99.5 percent nitrogen.
- 2.3 Mechanical Cleaning Materials and Equipment:
  - 2.3.1 Brushes shall be of the type for use with power units.
  - 2.3.2 Washwater shall be hot alkaline washwater for removing ash deposits.
- 3.0 EXECUTION:
  - 3.1 Clean boilers of all scale and deposits.
  - 3.2 Inspection: After cleaning, the boiler shall be given a visual inspection for effectiveness of scale removal.
  - 3.3 Welding and Burning: No welding or burning shall be allowed during cleaning operations.
  - 3.4 Alkaline Boilout:
    - 3.4.1 Boilout chemicals shall be completely dissolved in water before being introduced into the boiler.
    - 3.4.2 Boilout chemicals shall be trisodium phosphate and caustic soda, 1,500 to 2,500 ppm concentration or caustic soda and soda ash, 3,000 ppm concentration.
    - 3.4.3 Boilout pressure shall be operating pressure for boilers operating at 200 psig and less. For boilers operating at above 200 psig, the boilout pressure shall be 200 psig or one-half the operating pressure, whichever is higher. In no case shall boilout pressure exceed 600 psig.
    - 3.4.4 Concentration of chemicals and duration of boilout will be dependent upon the scale analysis. Boilout time may vary from 8 to 24 hours with boiler water solids purged by blowdown at approximately 4-hour intervals.
    - 3.4.5 Flush unit with demineralized water until the effluent is clear of visible solids.
  - 3.5 Acid cleaning, using either the circulating or soaking method, shall be done in the following sequence.
    - a. Wash heating surfaces with an acid solvent containing a proper inhibitor. •15560
    - b. Flush unit with clean water.
    - c. Neutralize and passivate the unit.
    - d. Flush the unit with clean water.
  - 3.6 Circulating Method:
    - 3.6.1 Acid Application: Acid cleaning time shall vary from a minimum of 4 hours, depending on scale analysis. Time shall be determined by analyzing samples of return solvent for iron concentration and acid strength.
    - 3.6.2 Flushing: After cleaning, flush unit with demineralized water until pH reaches 6.5.

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- 3.6.3 Neutralization: After flushing, neutralize the unit with ammonia and hydrazine for 2 hours at 200 F.
- 3.6.4 Final Flush: Final flush with demineralized water until pH reaches 7.5.
- 3.7 Soaking Method:
  - 3.7.1 Application: Acid cleaning time shall vary from 4 to 8 hours depending on scale analysis. For soft sludges, cleaning time shall be a minimum of 4 hours. Cleaning time shall be 6 hours for thin coatings of hard scale. For heavy deposits, cleaning time shall be a maximum of 8 hours. The time periods noted are actual retention time of the solvent in the unit, including the time of filling and draining. Unit shall be drained under nitrogen pressure.
  - 3.7.2 Flushing: After required cleaning time, flush unit with demineralized water.
  - 3.7.3 Neutralizing: After flushing, the unit shall be neutralized and passivated with a solution of soda ash and boiled out for a period of 4 to 6 hours. The boilout pressure shall be operating pressure for boilers operating at 200 psig and less. For boilers operating at above 200 psig, the boilout pressure shall be 200 psig or one-half the operating pressure, whichever is higher. In no case shall boilout pressure exceed 600 psig.
  - 3.7.4 Final Flush: After boilout, the unit shall be drained and flushed with demineralized water containing sodium nitrate, until the pH reaches 7.5.
- 3.8 Effluent Neutralization: The solvent effluent drained from the unit shall be neutralized with caustic soda or soda ash to a pH of 6.8 to 8.5.

**Firebrick Fireboxes for Boilers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of fire brick fireboxes for boilers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 P PRODUCTS:
  - 2.1 Replacement parts and materials for pressure parts, or for attachment to pressure parts, shall comply with requirements of the ASME Boiler and Pressure Vessel Code for new construction.
  - 2.2 The Following Refractory Materials shall comply with the requirements of ASTM C 27: fire brick, refractory tile, plastic refractory, castable refractory, and refractory mortar.
- 3.0 EXECUTION:
  - 3.1 Repair and maintenance work shall be performed in accordance with procedures developed by the Contractor that are in compliance with requirements of the ASME Boiler and Pressure Vessel Code and have been approved by the Authorized Member Representative.
  - 3.2 No personnel shall enter the boiler until it has been removed from service, cooled, drained, and purged, and the atmosphere in the boiler has been checked with a Burrel or other suitable instrument and found to be free of toxic, explosive, or suffocating gases.
  - 3.3 Fire Tube Boilers:
    - 3.3.1 When replacing burner throat tile, maintain correct throat diameter and ensure that throat is centered in the furnace.
    - 3.3.2 Repair burner throat and furnace liner tile cracks with high temperature bonding mortar.
    - 3.3.3 Wash coat burner throat and furnace liner tile with high temperature bonding mortar diluted with water.
    - 3.3.4 Patch cracks, 1/8 inch and larger in width, with high temperature bonding mortar or high temperature plastic refractory.
    - 3.3.5 Patch gap between cast refractory and baffle tile with high temperature plastic refractory.
    - 3.3.6 Patch damaged rear door refractory with cast refractory.
  - 3.4 Watertube Boilers: Repair cracks with ceramic fiber. Apply wash coat to burner throat.
  - 3.5 Closing the Boiler: Repairs shall not be covered by replaced or reinstalled materials until authorized.
  - 3.6 Drying Out:
    - 3.6.1 Air Dry: Allow refractory to air dry as long as possible.
    - 3.6.2 Fire Dry: To thoroughly dry refractory by firing, fire boiler intermittently at low rate. •15566

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**Firebrick for Insulation of Boiler Fireboxes**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of firebrick for insulation of boiler fireboxes. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Replacement parts and materials for attachment to pressure parts of the boiler shall comply with requirements of the ASME Boiler and Pressure Vessel Code for new construction.
  - 2.2 Firebrick, plastic refractory, castable refractory, and refractory mortar shall conform to the requirements of ASTM C 27.
- 3.0 EXECUTION:
  - 3.1 No personnel shall enter the boiler until it has been removed from service, cooled, drained, purged, and the atmosphere in the boiler has been checked with a Burrel or other suitable instrument and found to be free of toxic, explosive, or suffocating gases.
  - 3.2 Repair and maintenance work shall be performed in accordance with procedures in compliance with requirements of the ASME Boiler and Pressure Vessel Code and NB-132, and approved by the Authorized Member Representative.
  - 3.3 Closing the Boiler: Repairs shall not be covered by replaced or reinstalled materials until authorized.
  - 3.4 Drying Out: Allow refractory to dry as long as possible.

**Oil-fired and Gas-fired Burners for Boilers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of oil-fired and gas-fired burners for boilers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Oil-fired burner pipe, tubing, fittings, flanges, valves, and gaskets shall comply with the requirements of ASME B31.1.
  - 2.2 Gas-fired burner pipe, tubing, fittings, flanges, valves, and gaskets shall comply with the requirements of ANSI Z223.1.
  - 2.3 Burner and pilot system and combustion and safety controls shall comply with the requirements of NFPA 85A, 85B, or 85D; or Mil. Spec. MIL-B-18796.
  - 2.4 Electrical Devices: Electrical equipment, control relays, devices, wiring, and enclosures shall comply with the requirements of ANSI C1.
- 3.0 EXECUTION:
  - 3.1 No personnel shall enter the boiler until it has been removed from service, cooled, purged and the atmosphere in the boiler has been checked with a Burrel or other suitable instrument and found to be free of toxic, explosive, or suffocating gases.
  - 3.2 Before welding, brazing, or cutting, gas piping shall be purged and the atmosphere checked and found to be free of an explosive gas mixture.
  - 3.3 Oil-Fired Burner Repairs: All oil-fired burners, equipment, and control repairs shall be accomplished in compliance with ANSI B31.1 and C1, NFPA 85A or 85D, and Mil. Spec. MIL-B-18796. All welding of piping shall comply with the welding procedures and qualifications of ANSI B31.1.
  - 3.4 Gas-Fired Burner Repairs: All gas-fired burners, equipment, and control repairs shall be accomplished in compliance with ANSI Z223.1 and C1, NFPA 85A or 85B, and Mil. Spec. MIL-B-18796. All welding of piping shall comply with the welding procedures and qualifications of ANSI B31.2.
  - 3.5 Inspection and Testing:
    - 3.5.1 Leak Test all piping.
    - 3.5.2 Pressure test all piping in compliance with ANSI B31.1 for oil-fired burners or ANSI B31.2 for gas-fired burners.

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**Coal-firing Systems for Boilers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of coal-firing systems for boilers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Coal-firing system equipment and materials shall comply with the requirements of ANSI B31.1, ASME Boiler and Pressure Vessel Code Section II, and NFPA 85E.
  - 2.2 Burner and pilot system and combustion and safety controls shall comply with the requirements of NFPA 85E.
  - 2.3 Electrical Devices: Electrical equipment, control relays, devices, wiring, and enclosures shall comply with the requirements of ANSI C1 and NFPA 70.
- 3.0 EXECUTION:
  - 3.1 No personnel shall enter the boiler until it has been removed from service, cooled, purged, and the atmosphere in the boiler has been checked with a Burrel or other suitable instrument and found to be free of toxic, explosive, or suffocating gases.
  - 3.2 Before welding, brazing, or cutting, coal piping shall be purged and the atmosphere checked and found to be free of an explosive coal/air mixture.
  - 3.3 Coal-fired Burner Repairs: All coal-fired burners, equipment, and control repairs shall be accomplished in compliance with ANSI B31.1 and C1, ASME Boiler and Pressure Vessel Code, Section II, and NFPA 85E. All welding of piping shall comply with the welding procedures and qualifications of ANSI B31.1 and ASME Boiler and Pressure Vessel Code, Section IX.
  - 3.5 Testing: Leak test all piping. Pressure test all piping in compliance with ANSI B31.1 and ASME Boiler and Pressure Vessel Code, Section II.

**Draft Control Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of draft control equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Structural Steel shall comply with ASTM A 36.
  - 2.2 Steel Pipe shall comply with ASTM A 53.
  - 2.3 Piping Components shall comply with ASTM A 105.
  - 2.4 Flanges, Fittings, and Valves shall comply with ASTM A 181.
  - 2.5 Seamless Copper Tube shall comply with ASTM B 75.
  - 2.6 Insulation shall comply with ASTM C 547.
  - 2.7 Thermal Insulation and Finishing Cement shall comply with ASTM C 449.
  - 2.8 Welding and brazing materials shall be as specified in Section II of the ASME Boiler and Pressure Vessel Code.
- 3.0 EXECUTION:
  - 3.1 Safety: Adequate natural or forced ventilation shall be provided during repair activities conducted in confined spaces. Forced or induced draft fans shall be rendered inoperable before performing internal repairs to the fan casing or adjacent ductwork.
  - 3.2 Repairs shall be accomplished in compliance with NFPA 70.
  - 3.3 Welding and brazing shall be performed in accordance with Section IX of the ASME Boiler and Pressure Vessel Code.
  - 3.4 Drive train components shall be repaired or replaced to transmit power free from vibration at the required torque.

**Breeching**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of breeching. Products shall match existing materials and/or shall be as directed by the Authorized Member

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Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Metal Breeching:

- 2.1.1 Carbon steel shall comply with ASTM A 568.
- 2.1.2 Galvanized steel shall be carbon steel complying with ASTM A 568, galvanized in compliance with ASTM A 123.
- 2.1.3 Stainless steel shall comply with ASTM A 167.
- 2.1.4 High heat insulating refractory shall be an alumina-silica-base castable refractory complying with ASTM C 27.
- 2.1.5 Acid resistant liner shall be phenolic, rubber, and polyester resin liner.
- 2.1.6 Insulation: Calcium silicate block type insulation shall comply with ASTM C 533. Mineral fiber insulation shall be block type complying with ASTM C 612, Class 1.
- 2.1.7 Bolts and Nuts: Where breeching is connected to stack by means of a flange, bolts shall be high temperature alloy steel bolts complying with ASTM A 193, with hex nuts complying with ASTM A 194.
- 2.1.8 Paint for prime coats and finish coats for touchup or refinishing shall be of the high heat-resistant type.

2.2 Masonry:

- 2.2.1 Mortar and grout for repair of cracks in reinforced concrete shall comply with ASTM C 476. Mortar for use in the repair or replacement of brick lining in high heat breeching shall be ground fire clay complying with ASTM C 27. Chemical-resistant mortar shall be resin mortar complying with ASTM C 395.
- 2.2.2 Brick for lining of high heat breeching requiring acid resistance shall be refractory brick complying with ASTM C 27. Brick for breeching requiring acid resistance shall be chemical-resistant brick complying with ASTM C 279, type H. 2.2.3 Inspection Doors shall be heavy-duty cast iron or steel, lined on interior with insulating, castable refractory complying with ASTM C 64.
- 2.2.4 Insulation: Calcium silicate block type insulation shall comply with ASTM C 533. Mineral fiber insulation shall be block type complying with ASTM C 612, Class 1.

2.3 Refractory Brick:

- 2.3.1 Brick shall be high heat refractory type complying with ASTM C 27.
- 2.3.2 Mortar: Fire clay mortar shall be of high heat, ground type complying with ASTM C 27. Chemical-resistant mortar shall be the silica type complying with ASTM C 466.
- 2.3.3 Refractory shall be of the insulating, castable type complying with ASTM C 27. Chemical-resistant type castable refractory shall be in compliance with ASTM C 401.
- 2.3.4 Inspection doors shall be heavy-duty cast iron or cast steel, lined on the interior with insulating castable refractory complying with ASTM C 64.

3.0 EXECUTION:

- 3.1 Flame Cutting: No cutting by torch shall be done without authorization from the Authorized Member Representative.
- 3.2 Welding: All welding shall be performed in compliance with AWS D1.1.
- 3.3 Installation of breechings shall be in compliance with NFPA 211.

**Stacks**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of stacks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Metal Stacks:

- 2.1.1 Carbon Steel shall comply with ASTM A 568.
- 2.1.2 Galvanized steel shall be carbon steel complying with ASTM A 568, galvanized in compliance with ASTM A 123.
- 2.1.3 Stainless steel shall comply with ASTM A 167.

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- 2.1.4 Insulating refractory shall be alumina-silica base castable refractory complying with ASTM C 27.
- 2.1.5 Acid-resistant liner shall be phenolic, rubber, and polyester resin liner.
- 2.1.6 Insulation: Calcium silicate block type insulation shall comply with ASTM C 533. Mineral fiber insulation shall be block type complying with ASTM C 612, Class 1.
- 2.1.7 Insulation Jacket: Canvas jacket shall be 8-ounce standard proprietary canvas jacket. Aluminum jacket shall be 0.016 inch thick, corrugated, embossed, or smooth, complying with ASTM B 209, temper H14, Type 3003 or 5010 with 50-pound polyethylene vapor barrier. Supports for aluminum jacket shall be stainless steel Z-clips and bands 0.016 inch thick by 3/4 inch wide.
- 2.1.8 Bolts and Nuts: Where breeching is connected to stack by means of a flange, bolts shall be high temperature alloy steel bolts complying with ASTM A 193, with hex nuts complying with ASTM A 194.
- 2.1.9 Steel rivets shall comply with ASTM A 502.
- 2.1.10 Steel structural wire rope shall be zinc-coated and shall comply with ASTM A 603. •15577
- 2.1.11 Paint for prime coats and finish coats for touchup or refinishing shall be of the high-heat-resistant type.
- 2.2 Masonry Stacks:
  - 2.2.1 Ceramic glazed clay brick shall comply with ASTM C 126.
  - 2.2.2 Chemical-resistant masonry units shall comply with ASTM C 279.
  - 2.2.3 Castable refractory shall comply with ASTM C 401.
  - 2.2.4 Mortar for fireclay brick shall comply with ASTM C 27. Mortar for chemical-resistant applications shall comply with ASTM C 395. Mortar and grout for reinforced masonry shall comply with ASTM C 476.
- 2.3 Prefabricated stacks shall consist of double-wall vent pipe and fittings. All components shall be UL-listed and shall comply with NFPA 211.
- 3.0 EXECUTION:
  - 3.1 Installation or repair of all stacks shall be in accordance with NFPA 211.
  - 3.2 Flame Cutting: No cutting by torch shall be done without authorization from the Authorized Member Representative.
  - 3.3 Welding: All welding shall be performed in compliance with AWS D1.2.

**Boiler Feedwater Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of boiler feedwater equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Specialty components and parts shall be in accordance with applicable requirements of the ASME Boiler and Pressure Vessel Code.
  - 2.2 Welding and brazing materials shall be as specified in Section II of the ASME Boiler and Pressure Vessel Code.
- 3.0 EXECUTION:
  - 3.1 Repairs shall be accomplished with either the entire feedwater system or applicable portions isolated from service and drained.
  - 3.2 All isolation valves shall be secured in the closed position, all drain valves secured in the open position, and pumps rendered inoperative before and during repairs to the deaerators, softeners, and chemical feeders.
  - 3.3 Welding shall be performed in accordance with Section IX of the ASME Boiler and Pressure Vessel Code.
  - 3.4 Electrical work shall comply with the requirements of NFPA 70.
  - 3.5 Drive train components shall be repaired or replaced to transmit power free from vibration at the required torque.
  - 3.6 Repair procedures for receiver vessels shall provide structural integrity as specified in NB-23.

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**Gas Meters and Regulators**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of gas meters and regulators. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Meters: Meters shall conform to Mil. Spec. MIL-M-18294, Style B, without resettable counter. Meters shall be pipe or pedestal mounted.
  - 2.2 Pressure Regulators: Pressure regulators shall have iron or steel bodies and shall be adjustable for changing the downstream pressure. The regulator shall be adjustable with automatic loading, and shall have automatic pressure relief. The pressure relief shall be diaphragm-operated, spring-loaded type with vent for relief.
  - 2.3 Valves: Valves shall conform to API Spec. 6D, Class 150.
- 3.0 EXECUTION:
  - 3.1 Installation of meters shall conform to ANSI B31.8. Permanent gas meters shall be installed with provisions for isolation and removal for calibration and maintenance.
  - 3.2 Installation of pressure regulators shall be installed with by-pass line and lubricated plug valves installed in the by-pass line and on each side of the regulator between the regulator and by-pass connections.
  - 3.3 Installation of strainer shall be upstream of meter.
  - 3.4 Installation of pressure reducing valve at meter station shall be provided as needed.

**Fuel Handling Systems**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of fuel handling systems. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Fuel handling system components shall comply with applicable requirements of API.
  - 2.2 Fuel unloading hose shall be in compliance with applicable requirements of UL 180, 330, 536, and 569 and of ANSI/ASME B31.3.
  - 2.3 Gasoline dispensing pumps shall be in compliance with applicable requirements of UL 79 and 87 and of MIL-P-10406.
  - 2.4 Oil/water separators shall be of the coalescing type, with coalescing media as required for the application. Separators shall be repaired or constructed in compliance with Section VIII of the ASME Boiler and Pressure Vessel Code.
- 3.0 EXECUTION:
  - 3.1 Repair and replacement work shall be performed in compliance with applicable requirements of NFPA 30, NFPA 70, and the ASME Code.
  - 3.2 Welding shall be performed in accordance with ANSI B31.3 and ASME Boiler and Pressure Vessel Code, Section IX.
  - 3.3 Flushing: Repaired or replaced systems shall be flushed with the same type of fuel intended for use in the system until the outflowing fuel is free of sediment and emulsion and does not appear cloudy or hazy.

**Warm Air Furnaces**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of warm air furnaces. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:

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- 2.1 New furnace shall comply with the AGA Directory of Certified Appliances and Accessories, NFPA 70, and UL 296, 378, 499, 727, 795, and 900 as applicable.
- 2.2 Filters may be permanent, cleanable type or throw-away type and shall comply with requirements of UL 900. Face velocity of air at maximum flow rate shall not exceed 360 cubic feet per minute for standard velocity filters and 520 feet per minute for high velocity filters.
- 2.3 Flues shall be double-walled and constructed of galvanized steel complying with ASTM A 526.
- 2.4 Controls:
  - 2.4.1 Thermostats shall be low voltage type designed to operate on control circuits not exceeding 30 volts.
  - 2.4.2 Limit control for oil or gas furnaces shall be designed and installed to shut down the burner when the bonnet air temperature reaches 200 F. Differential shall be fixed at not less than 10 F and not greater than 25 F.
  - 2.4.3 Blower control shall prevent operation of blower after burner has fired until the discharge air at bonnet reaches a predetermined temperature. Fan "on" setting shall be adjustable within range of 90 F to 140 F. Differential setting may be fixed between 24 F and 36 F or adjustable between 20 F to 50 F. Blower control shall include manual switch.
- 2.5 Gas Furnaces:
  - 2.5.1 Gas burners shall be of corrosion-resistant steel and shall be designed, adjusted, rated, and certified to fire natural, manufactured, mixed, or propane gas. Burners rated 400,000 Btuh input or less shall be manually or electrically ignited, standing pilot type. Burners rated greater than 400,000 Btuh input shall be electrically ignited, proven pilot type.
  - 2.5.2 Heat exchangers shall be fabricated from steel complying with ASTM A 568.
  - 2.5.3 Gas valves shall be provided with a safety shutoff that will, in the event of flame failure, cause safety shutdown of the burner; an automatic pilot; and except for furnaces firing propane gas, an automatic gas pressure regulator.
  - 2.5.4 Furnace housings shall be constructed of not less than 22-gauge steel complying with ASTM A 424, with baked enamel coating.
- 2.6 Oil Furnaces:
  - 2.6.1 Burners shall be of flange-mounted high pressure atomizing type. Burner ignition shall be by continuous, automatic, cadmium cell control. The burner shall incorporate an oil pump, burner motor, combustion air fan, and burner tube.
  - 2.6.2 Heat exchangers shall be fabricated from cold-rolled steel complying with ASTM A 568 with radiation shield and combustion chamber of stainless steel complying with ASTM A 167.
  - 2.6.3 Furnace housings shall be constructed of not less than 22-gauge steel complying with ASTM A 424 with baked enamel coating.
- 2.7 Electric Furnaces:
  - 2.7.1 Heater elements shall be helically coiled, nickel-chromium wire, individually sequenced with individual Thermal limit controls and fusible links for each element. Entire design shall be UL 499 listed and shall comply with NFPA 70.
  - 2.7.2 Furnace housings shall be constructed of not less than 22-gauge steel complying with ASTM A 424 with baked enamel coating.
- 3.0 EXECUTION:
  - 3.1 New furnace shall be installed in accordance with UL 499, UL 727, or UL 795 as applicable.
  - 3.2 Welding shall be performed in compliance with AWS D1.1.
  - 3.3 Damage to galvanized coatings shall be repaired by application of galvanizing repair paint complying with Mil. Spec. DOD-P-21035.
  - 3.4 Corroded Heat exchangers shall be removed and replaced.
  - 3.5 Flue: Replace corroded sections of flue in compliance with UL 378.
  - 3.6 Controls: Replace defective controls in compliance with NFPA 70.

**Gas Unit Heaters**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of gas unit heaters. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product

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manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

- 2.1 New unit heater shall comply with AMCA 99 and 210, AGA Directory of Certified Appliances and Accessories; NFPA 70; and UL Electrical Construction Materials Directory and UL 795.
- 2.2 Heat exchangers shall be fabricated from steel complying with ASTM A 569 to form a unitized, multi-section type heat exchanger and combustion chamber for each burner.
- 2.3 Burners shall be of a corrosion-resistant steel with unitized rows of burners to provide one burner per heat exchanger section and shall have crossover igniter to provide positive ignition of each burner row.
- 2.4 Housings shall be fabricated from sheet steel of a thickness to provide sufficient strength to ensure rigidity and shall include a flue connection. The housing shall be provided with means for suspension or floor mounting as required.
- 2.5 Fans shall be the propeller type, fabricated of aluminum or steel, dynamically balanced, and direct motor driven. Fan motors shall be totally enclosed type, and built-in thermal overload protection shall be provided for single phase motors.
- 2.6 Controls:
  - 2.6.1 Thermal limit control shall be provided to shut off gas supply in the event normal operating temperatures are exceeded.
  - 2.6.2 Fan delay switch shall be provided for continuous fan operation after burner shutdown until heat exchanger temperature is reduced to prevent excessive heat build-up.
  - 2.6.3 Gas valve with safety shutoff and manual main shutoff shall be provided with automatic pilot and shall automatically regulate gas pressure and, in the event of flame failure, shall cause safety shutdown of burner.
  - 2.6.4 Thermostat shall be wall-mounted, heavy-duty type with enclosed contacts, with a 3-position selector switch to permit manual fan operation independent of temperature control. Control circuit voltage shall not exceed 30 volts as provided by a factory-installed control circuit transformer.
- 3.0 EXECUTION:
  - 3.1 Welding shall be in compliance with AWS D1.1.
  - 3.2 Blazing shall be in compliance with ASME Boiler and Pressure Vessel Code, Section IX.
  - 3.3 Damage to galvanized coatings shall be repaired by applying galvanizing repair paint complying with Mil. Spec. DOD-P-21035.

**Oil Unit Heaters**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of oil unit heaters. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 New unit heaters shall comply with AMCA 99 and 210, AGA Directory of Certified Appliances and Accessories; NFPA 70; UL Electrical Construction Materials Directory; and UL 296.
  - 2.2 Heat exchangers shall be of corrosion-resistant steel and shall include a combustion chamber (primary heating surface) and a heat exchanger (secondary heating surface).
  - 2.3 Burners shall be the high pressure or low pressure atomizing type. The burner shall be completely automatic and shall incorporate an oil pump, burner motor, combustion air fan, burner tube, and automatic ignition.
  - 2.4 Housings shall be fabricated from sheet steel of a thickness to provide sufficient strength to ensure rigidity. The housing shall be provided with means of suspension. Housing shall include a flue connection.
  - 2.5 Fan shall be the propeller type fabricated of aluminum or steel.
  - 2.6 Controls:
    - 2.6.1 Thermal limit control shall be provided to shut off oil supply in the event normal operating temperatures are exceeded.
    - 2.6.2 Fan delay switch shall be provided for continuous fan operation after burner shutdown until heater

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exchanger temperature is reduced to prevent excessive heat build-up.

- 2.6.3 Thermostat shall be unit- or wall-mounted and shall be heavy duty type with enclosed contacts, with a 3-position selector switch to permit manual fan operation independent of temperature control. Control circuit voltage shall not exceed 30 volts as provided by a factory-installed control circuit transformer.
- 3.0 EXECUTION:
- 3.1 Welding and brazing shall be in compliance with AWS D1.1.
- 3.2 Damage to galvanized coatings shall be repaired by applying galvanizing repair paint complying with Mil. Spec. DOD-P-21035.

**Air-cooled Condensing Units**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of air-cooled condensing units. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: All products shall be rated in accordance with ARI 210 and 270.
- 2.1 Compressor: Provide a hermetic or semi-hermetic compressor with crankcase heaters, inherently protected motors, spring mounts, and capacity modulation.
- 2.2 Condenser Coils: Provide copper tubes with mechanically bonded aluminum fins.
- 2.3 Fans and Motor: Provide propeller-type with direct drive or belt drive and vertical discharge. Protect fan with heavy-gauge wire guard. Provide motors that are inherently protected, permanently lubricated, and weatherproof. Motors shall be totally enclosed type or dripproof.
- 2.4 Casing: Furnish a unit designed for outdoor mounting. Fabricate the casing of heavy-gauge steel that is zinc coated and finished with enamel.
- 2.5 Controls: Provide safety and operating controls, factory-wired and mounted in an enclosure. Include pressure switches and motor overload devices.
- 3.0 EXECUTION: Follow manufacturer's recommendations.

**Condensers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of condensers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Air-Cooled Condensers:
  - 2.1.1 New air-cooled condenser, when required, shall be a factory-fabricated and assembled unit consisting of coils, fans, and electric motor drive. The condenser shall be designed, fitted, and rated in compliance with recommendations and requirements of ARI 460, ASHRAE 20, and UL 207. Sizing of condenser shall be based on a temperature difference between entering outside air and condensing refrigerant not exceeding 30 F. The saturated refrigerant condensing temperature shall not be over 130 F.
  - 2.1.2 Electric motor shall be totally enclosed type located within the enclosure and fully protected from the weather. Motor starter shall be magnetic across the line type with general purpose enclosure. Thermal overload protection shall be the manual reset type.
  - 2.1.3 Housing shall be fabricated from sheet carbon steel complying with ASTM A 569.
  - 2.1.4 Refrigerant piping shall be hard drawn copper, Type L, refrigeration grade complying with ASTM B 75. Valves shall be of brass construction, diaphragm packless or back seating type, specifically designed for refrigeration service.
- 2.2 Water-Cooled Condensers:
  - 2.2.1 New condensers shall be of shell-and-tube construction. The condenser shall be designed, fitted, and rated in compliance with the recommendations and requirements of ARI 450, ASHRAE 22, and UL 207. The condenser shall be constructed in compliance with Section VIII of ASME Boiler and Pressure Vessel Code.

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- 2.2.2 Refrigerant receiver shall comply with Sections II and VIII of the ASME Boiler and Pressure Vessel Code.
- 2.2.3 Condenser materials for repairs shall be in compliance with Section II of the ASME Boiler and Pressure Vessel Code.
- 2.2.4 Condenser tubes shall be fabricated of seamless copper tubing with integral fins, and the tubes shall be individually replaceable and rolled or brazed into the tube sheets of the shell-and-tube unit. The entire bundle shall be removable on shell-and-coil units.
- 3.0 EXECUTION:
- 3.1 Condensers shall be repaired and retested in compliance with Section VIII of the ASME Boiler and Pressure Vessel Code.
- 3.2 Condenser tubes shall be repaired and retested in compliance with Section VIII of the ASME Boiler and Pressure Vessel Code.
- 3.3 Welding and brazing shall be performed in compliance with AWS D1.1 and Section IX of the ASME Boiler and Pressure Vessel Code.
- 3.4 Damage to galvanized coatings shall be repaired by application of galvanizing repair paint complying with Mil. Spec. DOD-P-21035.

**Refrigerant Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of refrigerant equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Performance Ratings: The performance rating of each item of the new refrigerant equipment furnished shall comply with the applicable portions of ARI 450, 460, 495, and 590.
- 2.2 Bearings shall be an exact replacement. Bearing life shall be equal to the bearing to be replaced.
  - 2.2.1 Bearings for reciprocating equipment shall be precision, oil-cooled or babbitted type.
  - 2.2.2 Bearings for centrifugal equipment or rotary screw equipment shall be precision, oil-cooled type.
- 2.3 Mufflers shall be a hot-gas muffler or an exact replacement as indicated. Muffler shall be able to reduce vibration and noise from pulsation.
- 3.0 EXECUTION:
- 3.1 Welding: All welding shall be in compliance with AWS D1.1.
- 3.2 Damage to galvanized coatings shall be repaired by application of galvanizing repair paint complying with Mil. Spec. DOD-P-21035.
- 3.3 Controls:
  - 3.3.1 Chiller Controls: Replace, adjust, and recalibrate defective parts and assemblies.
  - 3.3.2 Starter Controls: Replace defective contactors and relays as necessary.
  - 3.3.3 Capacity Controls: Adjust guide vane linkages and actuator control in compliance with the manufacturer's specification.
- 3.4 Noncondensables: Check accumulation rate of noncondensables in absorption refrigerant equipment for compliance with manufacturer's instructions.

**Refrigeration Specialties**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of refrigeration specialties. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Thermostatic expansion valves shall be rated and tested in accordance with ASHRAE 17 or ARI 750.
- 2.2 Filter driers shall be sealed in-line type or replaceable core type as required. Filter driers shall be tested and rated in accordance with ASHRAE 63 and ARI 710 and shall meet the requirements of UL 207.

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- 2.3 Sight glasses for moisture and liquid indication shall be UL listed.
- 2.4 Refrigerants shall be designated in accordance with ASHRAE 34.
- 3.0 EXECUTION: Installation of all refrigeration equipment shall comply with ASHRAE 15.

**Natural Draft Cooling Towers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of natural draft cooling towers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 New cooling towers shall be constructed in compliance with NFPA 214 and Mil. Spec. MIL-C-16278.
  - 2.2 Wood Towers:
    - 2.2.1 Framework shall be repaired with or constructed of redwood complying with CTI STD-103, or Douglas fir complying with CTI STD-114. Douglas fir shall have a preservative treatment in compliance with CTI WMS-112.
    - 2.2.2 Louvers shall be repaired with or constructed of redwood, Douglas fir or west coast hemlock. Douglas fir and hemlock shall have a preservative treatment in compliance with CTI WMS-112.
    - 2.2.3 Water basin shall be repaired with or constructed of redwood or Douglas fir. Douglas fir shall have a preservative treatment in compliance with CTI WMS-112.
  - 2.3 Metal Towers:
    - 2.3.1 Framework shall be repaired with or constructed of carbon steel complying with ASTM A 36, hot-dipped galvanized in compliance with ASTM A 123.
    - 2.3.2 Louvers shall be repaired with or constructed of carbon steel complying with ASTM A 366, hot-dipped galvanized in compliance with ASTM A 525.
    - 2.3.3 Water basin shall be repaired with or constructed of carbon steel complying with ASTM A 366, hot-dipped galvanized in compliance with ASTM A 525.
  - 2.4 Glass Fiber Towers:
    - 2.4.1 Framework shall be repaired with redwood complying with CTI STD-103, Douglas fir complying with CTI STD-114, or carbon steel complying with ASTM A 36, hot-dipped galvanized in compliance with ASTM A 123. Douglas fir shall have a preservative treatment in compliance with CTI WMS-112.
    - 2.4.2 Louvers shall be of rigid formed plastic complying with Fed. Spec. L-P-535.
    - 2.4.3 Water basin shall be repaired or constructed of redwood or Douglas fir or of carbon steel complying with ASTM A 366, hot-dipped galvanized in compliance with ASTM A 525. Douglas fir shall have a preservative treatment in compliance with CTI WMS-112.
- 3.0 EXECUTION:
  - 3.1 Existing cooling tower to be repaired shall be repaired in compliance with NFPA 214.
  - 3.2 Welding and brazing shall be performed in compliance with AWS D1.1.
  - 3.3 Damage to galvanized coatings shall be repaired by application of galvanizing repair paint complying with Mil. Spec. DOD-P-21035.
  - 3.4 Testing: Upon completion of repair work on a cooling tower or installation of a cooling tower, the repaired cooling tower shall be tested for proper operation in compliance with the manufacturer's specifications, and with CTI ATC-105 and ASME PTC 23 for field performance.

**Forced Draft and Induced Draft Cooling Towers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of forced draft and induced draft cooling towers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 New cooling towers shall be constructed in compliance with NFPA 214 and Mil. Spec. MIL-C-16278.
  - 2.2 Wood Towers:
    - 2.2.1 Louvers shall be redwood, complying with CTI STD-103 or Douglas fir or hemlock complying with

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- CTI STD-114. Douglas fir and hemlock shall have a preservative treatment in compliance with CTI WMS-112.
- 2.2.2 Fill or contact surface shall be redwood, complying with CTI STD-103, or Douglas fir or hemlock complying with CTI STD-114. Douglas fir and hemlock shall have a preservative treatment in compliance with CTI WMS-112.
  - 2.2.3 Drift eliminators shall be redwood, complying with CTI STD-103, Douglas fir or hemlock complying with CTI STD-114, or rigid formed plastic complying with Fed. Spec. L-P-535. Douglas fir and hemlock shall have a preservative treatment in compliance with CTI WMS-112.
  - 2.2.4 Water distribution basin shall be redwood, complying with CTI STD-103 or Douglas fir complying with CTI STD-114. Douglas fir shall have a preservative treatment in compliance with CTI WMS-112.
  - 2.2.5 Water collection basin shall be redwood, complying with CTI STD-103, Douglas fir complying with CTI STD-114, or carbon steel complying with ASTM A 366 and hot-dipped galvanized in compliance with ASTM A 525. Douglas fir shall have a preservative treatment in compliance with CTI WMS-112.
  - 2.2.6 Framework shall be redwood, complying with CTI STD-103, Douglas fir complying with CTI STD-114, or carbon steel complying with ASTM A 36 and hot-dipped galvanized in compliance with ASTM A 123.
  - 2.2.7 Casing shall be carbon steel, complying with ASTM A 366, hot-dipped galvanized in compliance with ASTM A 525.
- 2.3 Metal Towers:
- 2.3.1 Louvers shall be carbon steel, complying with ASTM A 366, hot-dipped galvanized in compliance with ASTM A 525.
  - 2.3.2 Fill or wet deck shall be carbon steel in compliance with ASTM A 366 and hot-dipped galvanized in compliance with ASTM A 525, rigid formed plastic complying with Fed. Spec. L-P-535, or stainless steel complying with ASTM A 167.
  - 2.3.3 Drift eliminators shall be carbon steel, complying with ASTM A 366 and galvanized in compliance with ASTM A 525, rigid plastic complying with Fed. Spec. L-P-535, or stainless steel complying with ASTM A 167.
  - 2.3.4 Water distribution basin shall be carbon steel, complying with ASTM A 366, hot-dipped galvanized in compliance with ASTM A 525.
  - 2.3.5 Water collection basin or Pan shall be carbon steel, complying with ASTM A 366 and hot-dipped galvanized in compliance with ASTM A 525 or stainless steel complying with ASTM A 167.
  - 2.3.6 Framework shall be carbon steel, complying with ASTM A 36, hot-dipped galvanized in compliance with ASTM A 123; or stainless steel complying with ASTM A 167.
  - 2.3.7 Casing shall be carbon steel, complying with ASTM A 366, hot-dipped galvanized in compliance with ASTM A 525; or stainless steel complying with ASTM A 167.
- 2.4 Glass Fiber Towers:
- 2.4.1 Louvers shall be formed rigid plastic complying with Fed. Spec. L-P-535.
  - 2.4.2 Fill shall be rigid plastic complying with Fed. Spec. L-P-535.
  - 2.4.3 Drift eliminators shall be formed rigid plastic complying with Fed. Spec. L-P-535.
  - 2.4.4 Water distribution basin shall be redwood, complying with CTI STD-103, Douglas fir complying with CTI STD-114, carbon steel complying with ASTM A 36 and hot-dipped galvanized in compliance with ASTM A 123, or carbon steel complying with ASTM A 366 and hot-dipped galvanized in compliance with ASTM A 525. Douglas fir shall have a preservative treatment complying with CTI WMS-112.
  - 2.4.5 Water collection basin shall be redwood, complying with CTI STD-103, Douglas fir complying with CTI STD-114, carbon steel complying with ASTM A 36 and hot-dipped galvanized in compliance with ASTM A 123, or carbon steel complying with ASTM A 366 and hot-dipped galvanized in compliance with ASTM A 525. Douglas fir shall have a preservative treatment complying with CTI WMS-112.
  - 2.4.6 Framework shall be redwood, complying with CTI STD-103, Douglas fir complying with CTI STD-114, or carbon steel complying with ASTM A 36 and hot-dipped galvanized in compliance with ASTM A 123. Douglas fir shall have a preservative treatment complying with CTI WMS-112.
  - 2.4.7 Casing shall be carbon steel, complying with ASTM A 366, hot-dipped galvanized in compliance with

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ASTM A 525.

3.0 EXECUTION:

- 3.1 Existing cooling tower to be repaired shall be repaired in compliance with NFPA 214.
- 3.2 Welding shall be performed in compliance with AWS D1.1.
- 3.3 Damage to galvanized coatings shall be repaired by application of galvanizing repair paint complying with Mil. Spec. DOD-P-21035.
- 3.4 Testing: Upon completion of repair work on a cooling tower or installation of a cooling tower, the repaired cooling tower shall be tested for proper operation in compliance with the manufacturer's specifications, CTI ATC-105, and ASME PTC 23, for field performance.

**Coils**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of coils. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Pressures:

- 2.1.1 Water coil design working pressure shall be 200 psig.
- 2.1.2 Steam coil design working pressure shall be 200 psig steam.
- 2.1.3 Each replacement water or steam coil shall be hydrostatically tested at 250 psig at the factory.
- 2.1.4 Each replacement direct expansion coil shall be pneumatically tested at the factory under water at not less than 300 psig. Each coil shall be completely dehydrated and sealed at the factory upon completion of pressure tests.

2.2 Water, Steam and Direct Expansion Coils:

- 2.2.1 Tubing shall be round, seamless, copper tubing, complying with ASTM B 75.
- 2.2.2 Fins shall be aluminum or copper.
- 2.2.3 Coil casing shall be made of galvanized sheet steel complying with ASTM A 526, minimum thickness of 14 gauge.
- 2.2.4 Water or steam coil headers shall be fabricated from steel pipe complying with ASTM A 53, Grade B; extra heavy seamless copper tubing complying with ASTM B 75; or semisteel complying with ASTM A 126, Class C.
- 2.2.5 Direct expansion coil headers shall be fabricated from extra heavy seamless copper tubing complying with ASTM B 75.
- 2.2.6 Each water coil shall be provided with a plugged vent tap and drain tap.
- 2.2.7 Each steam coil shall be provided with a vacuum breaker.

2.3 Electrical Heating Coils (and Heat Strips):

- 2.3.1 Resistance wire shall be nickel-chromium wire.
- 2.3.2 Tubular sheath shall be corrosion-resisting in the surrounding medium and suitable for the temperatures required by the particular application. 2.3.3 Insulating Material shall be densely packed, high purity magnesium oxide.
- 2.3.4 Insulator supports for directly exposed elements shall be ceramic or porcelain.
- 2.3.5 Grid and heat strip elements shall have the resistance wire surrounded by the insulation material and enclosed within the tubular sheath. The sheath shall be imbedded and completely sealed within the cast aluminum grid. Electrical terminals shall project through the cast aluminum grid and shall be designed to minimize the entrance of atmospheric moisture into the heating element.
- 2.3.6 Heat strip element resistance wire shall be uniformly spaced along the length of the sheath.

3.0 EXECUTION:

- 3.1 Fins shall be mechanically bonded or soldered to the tubes. Tubes shall be rolled and bushed, brazed, or welded to headers. Where required, multiple type supports shall be provided to prevent tube sag. The fin tube and header section shall float within the casing to allow free expansion.
- 3.2 Removing, Saving, Testing, Cleaning, and Recharging Refrigerants:
  - 3.2.1 Refrigerant in a system in which the coil is to be repaired or replaced shall be removed, saved, and reused in recharging the system. When repair or replacement of the coil has been completed, the refrigerant system shall be pressure-tested and recharged with refrigerant.

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- 3.2.2 The repaired coil shall be pressure-tested to 300 psig with dry nitrogen and allowed to stand for 24 hours with no pressure drop after repair or replacement of the coil. Then evacuate the system and/or coil with a vacuum pump capable of pulling 1 mm Hg vacuum absolute. Operate the vacuum pump until a vacuum of 2.5 mm Hg absolute is reached. After evacuation, recharge the system with the refrigerant previously removed. Recharge the refrigerant back into the system through a filter drier with capacity capable of removing foreign materials and moisture in the amount of refrigerant removed. The system shall be replenished with refrigerant to provide a fully charged system.
- 3.2.3 If the system has lost its full charge of refrigerant, a new suction line and liquid line filter drier, sized as recommended by the condenser manufacturer, shall be provided and the system pressure tested, evacuated, and recharged with refrigerant as specified above.
- 3.3 Welding shall be in compliance with AWS D1.1.
- 3.4 Brazing shall be in compliance with ASME Boiler and Pressure Vessel Code, Section IX.
- 3.5 Damage to galvanized coatings shall be repaired by application of galvanizing repair paint complying with Mil. Spec. DOD-P-21035.
- 3.6 Testing: Hydrostatically test repaired water and steam coils at 1-1/2 times the maximum working pressure.

**Steam and Hot Water Unit Heaters**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of steam and hot water unit heaters. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 New unit heaters shall comply with the requirements of AMCA 99 and 210; NFPA 70; and UL Electrical Construction Materials Directory.
  - 2.2 Coils:
    - 2.2.1 Coils shall be constructed of round seamless copper tubing complying with ASTM B 75, mechanically or hydraulically bonded or expanded into fins constructed of copper or of aluminum complying with ASTM B 209. Tube joints shall be made with high temperature brazing alloys complying with ASTM E 56.
    - 2.2.2 Coil headers shall be fabricated from seamless carbon steel pipe complying with ASTM A 53, extra heavy seamless copper tubing complying with ASTM B 75 or B 251, or semi-steel complying with ASTM A 126, Class C.
  - 2.3 Housings shall be fabricated from sheet steel complying with ASTM A 569 of a thickness and of sufficient strength to ensure rigidity. Unit heater housings shall be provided with means of suspension or floor mounting as required.
  - 2.4 Fan and Drive:
    - 2.4.1 Propeller and centrifugal fans shall be fabricated of aluminum or steel.
    - 2.4.2 Centrifugal Fan shaft shall be sized for maximum fan speed.
    - 2.4.3 Fan bearings on belt-driven units shall be self-aligning, permanently lubricated, or the periodic lubricating type with accessible lubricating means. Bearings shall be designed to withstand radial and thrust working loads.
  - 2.5 Controls: Unit heaters shall be furnished with unit-mounted line voltage thermostats to provide ON/OFF fan control.
- 3.0 EXECUTION:
  - 3.1 Welding shall be in compliance with AWS D1.1.
  - 3.2 Brazing shall be in compliance with ASME Boiler and Pressure Vessel Code, Section IX.
  - 3.3 Damage to galvanized coatings shall be repaired by applying galvanizing repair paint complying with Mil. Spec. DOD-P-21035.

**Cleaning of Heat Exchangers**

- 1.0 DESCRIPTION OF WORK: This specification covers the cleaning of Heat exchangers. Products and

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materials used shall be in accordance with the heat exchanger manufacturer's recommendations and/or shall be as directed by the Authorized Member Representative. Cleaning procedures shall be developed by the Contractor and shall be in accordance with the heat exchanger manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS

2.1 Equipment required for cleaning such as acid feed tank and pump, alkaline feed tank and pump, mixer, neutralizing tank and pump, power brushes, power cutters, and other related items shall be supplied by the Contractor.

2.2 Chemical Cleaning Materials:

2.2.1 Acid cleaning chemicals shall be hydrochloric acid complying with Fed. Spec. O-H-765, ammonium bifluoride NH<sub>4</sub>HF<sub>2</sub>, and sulfuric acid complying with Fed. Spec. O-S-809.

2.2.2 Neutralizing chemicals shall be one percent soda ash solution complying with ASTM D 458 and one percent caustic solution complying with ASTM D 456.

2.2.3 Flushing water shall be potable having not more than 1,000 ppm total solids.

2.3 Mechanical Cleaning Materials and Equipment:

2.3.1 Hot water shall be used for high velocity wash.

2.3.2 Powered brushes shall be of the type for use with power units.

2.3.3 Nylon brushes shall be of the type blown with high pressure water.

3.0 EXECUTION:

3.1 General: Clean heat exchangers of all scale and deposits. Straighten and clean fins on finned tubes.

3.2 Inspection: After heat exchanger cleaning operation, tubes will all be given a visual inspection by the Authorized Member Representative for effectiveness of scale removal.

3.3 Welding and Burning: No welding or burning shall be allowed during cleaning operation.

3.4 Acid wash time may vary from four to eight hours depending on scale analysis. Time shall represent actual retention of the solvent in the unit, including filling and draining time.

3.5 Effluent Neutralization: Solvent effluent drained from the unit shall be neutralized with caustic in compliance with ASTM D 456 or soda ash in compliance with ASTM D 458, to a pH of 6.8 to 8.5.

**Packaged Heat Pumps**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of air-cooled packaged heat pumps, including through-wall and roof top type units with supplemental electric heat. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Capacity and performance shall be based on standard air density (0.075 pounds per cubic foot). Fans shall have a peak static efficiency of not less than 60 percent. Capacity ratings shall be in accordance with ARI 240 and 270.

2.2 Casings shall have a corrosion protective coating. Casing shall have 1/2-inch thick minimum thermal insulation, and the compressor compartment shall have acoustical insulation.

2.3 Compressors shall be direct drive semi-hermetic with a maximum operating speed of 1,750 rpm. Each compressor shall have an independent refrigeration circuit with integral sub-cooling unit. Refrigerant accessories shall include a reversing valve and suction line oil/gas accumulator.

2.4 Evaporator coils shall be copper tubing with aluminum fins. New coils shall be pressure and leak tested at 1.5 times the working pressure.

2.5 Filters shall be 2-inch thick throwaway type.

2.6 Condensers shall have copper tubes and aluminum fins. New condensers shall be leak tested at the factory at 1.5 times the working pressure. A separate direct drive fan shall be included for each refrigeration circuit.

2.7 Auxiliary heating coil shall be low watt density, fin-tubular construction, protected by thermal safety switches.

2.8 Controls shall provide for automatic switchover between cooling and heating cycles.

3.0 EXECUTION:

3.1 Welding shall be performed in accordance with AWS D1.1 and/or ASME Boiler and Pressure Vessel

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Code, Section IX.

- 3.2 Brazing shall be performed in accordance with ASME Boiler and Pressure Vessel Code, Section IX.
- 3.3 Damage to galvanized coatings shall be repaired with paint complying with Mil. Spec. DOD-P-21035.

**Humidity Control Equipment**

- 1.0 DESCRIPTION OF WORK: This section covers the furnishing and installation of humidifiers and dehumidifiers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Humidifiers shall be pneumatic modulating type.
    - 2.1.1 Steam separator shall be designed to remove water droplets and particles larger than 3 microns when humidifier is operating at full capacity.
    - 2.1.2 Control valve shall be stainless steel plug type with pneumatic operator.
    - 2.1.3 Distribution manifold shall provide uniform dry steam distribution throughout its entire length.
    - 2.1.4 Strainer shall be Y-type.
    - 2.1.5 Steam trap shall be as recommended by the manufacturer of the steam humidifier and shall be preceded by a drip leg.
  - 2.2 Dehumidifiers shall be free-standing self-contained plug-in type units that are UL listed.
    - 2.2.1 Components shall be housed in a portable 22-gauge steel cabinet.
    - 2.2.2 Capacity ratings shall be in accordance with AHAM DH-1. Overflow cutoff control shall be provided.
- 3.0 EXECUTION:
  - 3.1 Steam supply manifold for humidifier shall be installed either perfectly level or extending upward vertically in duct. Discharge holes shall point upstream against airflow.
  - 3.2 Welding shall be performed in accordance with AWS D1.1 and ASME Boiler and Pressure Vessel Code, Section IX, where applicable.

**Radiators**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of radiators. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 New radiators shall comply with AGA Directory of Certified Appliances and Accessories; IBR Testing and Rating Code for Finned Tube (Commercial) Radiation, if applicable; NFPA 70; and UL 499 or UL 795, as applicable.
  - 2.2 Cast-iron radiators:
    - 2.2.1 Core shall be small tube section constructed of cast iron complying with ASTM A 48.
    - 2.2.2 Core sections shall be assembled with malleable iron or polytetrafluoroethylene coated steel push nipples.
  - 2.3 Baseboard-Fintube Radiators:
    - 2.3.1 Nonferrous fintube shall be fabricated of seamless copper tubing, complying with ASTM B 75 and mechanically expanded into aluminum fins.
    - 2.3.2 Ferrous fintube shall be fabricated of steel pressure tubing complying with ASTM A 450 and mechanically expanded into fins of steel sheet complying with ASTM A 568.
    - 2.3.3 Enclosure, dampers and element supports shall be fabricated from carbon steel complying with ASTM A 568.
  - 2.4 Radiant Radiators:
    - 2.4.1 Gas plenum shall be carbon steel with a porcelain enameled finish complying with ASTM A 424 and Fed. Spec. PPP-P-600, or galvanized in compliance with ASTM A 526.
    - 2.4.2 Air mixer shall be carbon steel with a corrosion-resistant finish complying with ASTM A 526 or ASTM A 568.

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- 2.4.3 Venturi shall be carbon steel complying with ASTM A 526 or ASTM A 568 with a corrosion-resistant finish.
- 2.4.4 Enclosure shall be carbon steel complying with ASTM A 526 or ASTM A 568.
- 2.5 Convactor Radiators:
  - 2.5.1 Electric heating element shall be constructed of nickel chromium wire enclosed within a metal sheath and electrically insulated in the sheath with a densely compacted refractory material.
  - 2.5.2 Hydronic/steam heating elements shall be constructed of seamless copper tubing complying with ASTM B 75 mechanically expanded into aluminum fins. The tube and fin assembly shall be encased in a frame of steel complying with ASTM A 568. Tube headers shall be steel or brass joined to the tubes by high temperature brazing alloys complying with ASTM E 56.
  - 2.5.3 Enclosure, dampers, element supports, and access doors (when applicable) shall be fabricated from carbon steel complying with ASTM A 568.
- 3.0 EXECUTION:
  - 3.1 Welding shall be performed in accordance with AWS D1.1.
  - 3.2 Damage to galvanized coatings shall be repaired by application of galvanizing repair paint complying with Mil. Spec. DOD-P-21035.

**Induction Units**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of induction units. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturers recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 New induction units shall include cabinet, primary air plenum with inlet collar, air balancing damper, multi-stage nozzles, coil, drain pan, and discharge stack. Units shall be tested and rated at the factory in accordance with ARI 445.
  - 2.2 Cabinet and primary air plenum shall be constructed of or repaired with 4 gauge galvanized steel with die-cast support frame members. Plenum shall be lined with 3/8-inch thick, 25-pound density insulation, black plastic bonded fiberglass, mat-faced.
  - 2.3 Nozzles shall be provided in vertical strips, precision-molded from heat-resistant thermoplastic material. Nozzles shall be designed for temperature range encountered with pressures up to 3-1/2 inch wg. Nozzle strips shall be mechanically sealed and locked to nozzle frame.
  - 2.4 Dampers shall be multiple hole design and shall extend the full length of the plenum. Adjustment shall be provided by manual push-pull operator located next to the primary air inlet.
  - 2.5 Coils shall be designed for 300 psi working pressure.
- 3.0 EXECUTION:
  - 3.1 Induction units shall be installed level, using shims if required, and anchored to the floor.
  - 3.2 Damage to galvanized coatings shall be repaired in compliance with Mil. Spec. DOD-P-21035.

**Air Handling Units**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of air handling units. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Built-up air handling units (AHUs) shall consist of casings, fan sections, coils, filter boxes, mixing boxes, dampers, and other equipment as required. All AHUs shall be certified in accordance with ARI 430. Coils shall be certified in accordance with ARI 410. Electric heating coils shall meet the requirements of UL and the National Electric Code. AHUs shall also conform to the requirements of NFPA 90A and all applicable SMACNA standards.
- 3.0 EXECUTION:
  - 3.1 Air handling units shall be installed to conform with NFPA 90A and applicable SMACNA standards.
  - 3.2 Welding shall be performed in compliance with AWS D1.1.

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**Centrifugal Fans**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of centrifugal fans. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Fan Performance:
    - 2.1.1 New fans shall comply with AMCA 210, 300, and 301.
    - 2.1.2 Capacity and performance of new or repaired fans shall be based on standard air density (0.075 pounds per cubic foot). Fans shall have a peak static efficiency of not less than 60 percent.
  - 2.2 Fan wheel and Shaft:
    - 2.2.1 Aluminum Fan wheels shall comply with Fed. Spec. QQ-A-596. Fan wheels for wall exhaust fans shall be constructed of aluminum complying with ASTM B 209. Steel for the Fan wheels shall comply with ASTM A 366.
    - 2.2.2 Fan shaft shall be turned, ground, and polished carbon steel alloy.
    - 2.2.3 Fan shaft shall be tubular with swaged ends accurately finished.
  - 2.3 Fan housing:
    - 2.3.1 Fan housing shall be carbon steel sheet complying with ASTM A 569, except wall exhaust Fan housings shall be spun aluminum complying with ASTM B 209.
    - 2.3.2 When the fan discharge of the existing housing to be replaced is changeable, discharge of the new housing shall be easily changed in compliance with AMCA 99.
  - 2.4 Inlet Boxes: Steel for repairs shall be carbon steel sheet complying with ASTM A 569.
  - 2.5 Bearings:
    - 2.5.1 Precision antifriction bearings shall comply with Fed. Spec. FF-B-171.
    - 2.5.2 Sleeve bearings shall be self-aligning sleeve bearings.
    - 2.5.3 Roller bearings shall be self-aligning, high load capacity, grease-lubricated, heavy-duty, pillow block type.
    - 2.5.4 Wall exhaust fan bearings shall be sealed-in lubrication, antifriction type adequate for both radial and thrust loads occurring in the mounting.
  - 2.6 Fan belts shall comply with RMA Engineering Standards for Multiple V-Belt Drives. Belts for multiple belt drives shall be installed in matched sets only.
  - 2.7 Insulation in Fan housing shall be mineral fiber complying with Fed. Spec. HH-I-558, Form B, Type 1. Adhesive shall be fire resistive adhesive complying with Mil. Spec. MIL-A-3316.
- 3.0 EXECUTION:
  - 3.1 Balancing: Centrifugal Fan wheels, repaired or new, shall be balanced statically and dynamically.
  - 3.2 Welding shall be performed in compliance with AWS D1.1.
  - 3.3 Damage to galvanized coatings shall be repaired by application of galvanizing repair point in compliance with Mil. Spec. DOD-P-21035.

**Axial Flow Fans**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of axial flow fans. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Capacity and performance shall be based on standard air density (0.075 pounds per cubic foot). Fans shall have a peak static efficiency of not less than 60 percent. New fans shall comply with AMCA 210, 300, and 301.
  - 2.2 Fan wheel repair material shall be sheet aluminum complying with ASTM B 209. New wheels shall be of airfoil design and shall be statically and dynamically balanced at the factory.
  - 2.3 Fan shafts shall be turned, ground, and polished steel of suitable size to operate well below first critical speed.
  - 2.4 Fan housing shall be 22 gauge, welded carbon steel complying with ASTM A 569.
  - 2.5 Propeller guards, when required, shall be sheet metal complying with ASTM A 366 or hot-dip

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- galvanized were complying with ASTM A 641.
- 2.6 Bearings shall be sealed-in lubrication, anti-friction type adequate for both radial and thrust loads occurring in the mounting.
  - 2.7 Fan belt shall comply with RMA Engineering Standards for Multiple V-Belt Drives. Belts for multiple belt drives shall be installed in matched sets only. Belt guards shall comply with OSHA.
  - 2.8 Insulation in Fan housing shall be mineral fiber complying with Fed. Spec. HH-I-545. Adhesive shall be fire resistive adhesive complying with Mil. Spec. MIL-A-3316.
  - 3.0 EXECUTION:
  - 3.1 Welding shall be performed in compliance with AWS D1.1.
  - 3.2 Damage to galvanized coatings shall be repaired by application of galvanizing repair in compliance with Mil. Spec. DOD-P-21035.

**Power Roof Ventilators**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of power roof ventilators. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 PRV Performance:
    - 2.1.1 New PVRs shall comply with AMCA 210, 300, and 301.
    - 2.1.2 Capacity and performance of new and repaired PRVs shall be based on standard air density (0.075 pounds per cubic foot). Fans shall have a peak static efficiency of not less than 60 percent.
  - 2.2 Fan wheel shall be centrifugal, axial flow, or turbine type, non-overloading, constructed of aluminum complying with ASTM B 209.
  - 2.3 Fan shaft shall be turned, ground, and polished steel of suitable size to operate well below first critical speed.
  - 2.4 Bearings shall be sealed-in lubrication, anti-friction type adequate for both radial and thrust load occurring in the mounting.
  - 2.5 Fan housing shall be spun aluminum complying with ASTM B 209. The housing shall be weatherproof with 360 degrees discharge air pattern.
  - 2.6 Fan belt shall comply with RMA Engineering Standards for Multiple V-Belt Drives. Belts for multiple belt drives shall be installed in matched sets only.
  - 2.7 Insulation in fan housing shall be mineral fiber complying with Fed. Spec. HH-I-558, Form B, Type 1. Adhesive shall be fire resistive adhesive complying with Mil. Spec. MIL-A-3316.
  - 2.8 Roof curb shall be prefabricated, with continuous welded water-tight seams. The curb shall be of the roofed-over, flashing type, with built-in cant strip.
  - 2.9 Back draft dampers for installation in the roof curb shall be multiple blade type, constructed of aluminum complying with ASTM B 209.
- 3.0 EXECUTION:
  - 3.1 Balancing: Centrifugal Fan wheels, repaired or new, shall be balanced statically and dynamically. Propeller fans shall be statically balanced.
  - 3.2 Welding shall be performed in compliance with AWS D1.1.
  - 3.3 Damage to galvanized coatings shall be repaired by application of galvanizing repair paint in compliance with Mil. Spec. DOD-P-21035.

**Diffusers, Registers, Grilles and Louvers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of diffusers, registers, grilles, and louvers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Supply air ceiling diffusers shall be constructed of aluminum or steel and shall be furnished with

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- volume control dampers. Provide ceiling-mounted diffusers with rubber gasket sponge and ceiling frames for anti-smudging protection.
- 2.2 Supply air slot diffusers for sidewall, sill, or floor mounting shall have 1/2-inch bar spacing with 0 degrees or 15 degrees deflection. Construction shall be extruded aluminum. Furnish with volume control damper.
  - 2.3 Return air registers shall be constructed of aluminum or steel and shall be furnished with opposed blade volume control dampers.
  - 2.4 Return air ceiling registers shall be constructed of aluminum with aluminum or plastic egg crate grille.
  - 2.5 Grilles shall be as specified for registers, without volume control damper.
  - 2.6 Louvers shall be in accordance with SMACNA Duct Construction Standards - Metal and Flexible. Louvers shall be constructed of aluminum or steel and shall be furnished with birdscreens. Louvers shall bear the AMCA Certified Ratings Seal for air performance and water penetrations ratings as described in AMCA 500.
  - 2.7 Inlets and outlets shall be sound rated and certified in accordance with ADC 1062R4 in sound power level, dB referenced to 10 to the minus 12 watt, in octave bands 2 through 8. Performance shall be certified in accordance with ADC 1062R4.
  - 2.8 Inlets and outlets shall follow recommended noise levels as stated in SMACNA Manual for HVAC Systems Duct Design.
  - 3.0 EXECUTION: Diffusers and registers shall be installed in accordance with applicable SMACNA Standards.
  - 3.1 Return air registers/grilles shall be similar to supply air registers/diffusers when applicable.

**Air Cleaning Devices**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of air cleaning devices. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Throwaway panel filters shall be constructed of glass, paper, or fabric media with a UL listing of Class 2 and shall be 1 or 2 inches thick as required. The filters shall have an initial resistance not greater than 0.30 inch w.g. at a face velocity of 500 fpm.
  - 2.2 Extended surface self-supporting filters shall be constructed of UL-listed Class 1 or Class 2 fibrous media, integral media support, and a rigid galvanized steel frame. Nominal thickness shall be 12 inches. Filter dustspot efficiency shall be rated in accordance with ASHRAE 52 Test Standard.
    - 2.2.1 Filters rated at 60-65 Percent Dustspot Efficiency shall have an initial resistance not greater than 0.50 inch w.g. at 500 fpm face velocity.
    - 2.2.2 Filters rated at 80-85 Percent Dustspot Efficiency shall have an initial resistance not greater than 0.60 inch w.g. at 500 fpm face velocity.
    - 2.2.3 Filters rated at 90-95 Percent Dustspot Efficiency shall have an initial resistance not greater than 0.70 inch w.g. at 500 fpm face velocity.
  - 2.3 Extended surface non-supported filters shall be constructed of UL-listed Class 1 or Class 2 fibrous media. Individual bags shall be retained by a galvanized steel frame. Filter dustspot efficiency shall be rated in accordance with ASHRAE 52 Test Standard.
    - 2.3.1 Filters rated at 60-65 Percent Dustspot Efficiency shall have an initial resistance not greater than 0.35 inch w.g. at 500 fpm face velocity.
    - 2.3.2 Filters rated at 80-85 Percent Dustspot Efficiency shall have an initial resistance not greater than 0.45 inch w.g. at 500 fpm face velocity.
    - 2.3.3 Filters rated at 90-95 Percent Dustspot Efficiency shall have an initial resistance not greater than 0.55 inch w.g. at 500 fpm face velocity.
  - 2.4 Automatic renewable roll filters shall be constructed of 2-inch thick, viscous-coated, UL-listed Class 1 or Class 2 fibrous media. Filter initial resistance shall be not greater than 0.50 inch w.g. at 500 fpm face velocity. Filter efficiency shall be 80-85 percent when tested in accordance with ASHRAE

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- 52.
- 2.5 Permanent washable panel filters shall consist of galvanized steel media and frames, 1-inch or 2-inch thickness as required. Filters shall have an initial resistance not greater than 0.10 inch w.g. at 500 fpm face velocity.
  - 2.6 HEPA filters shall be constructed of UL-listed Class 1 glass fiber media sealed in a rigid casing. Filters shall be rated by the DOP Test Method on 0.3 micron particles. Filter initial resistance shall not be greater than 1.0 inch w.g. for the rated airflow. Filters shall be furnished complete with necessary gaskets.
    - 2.6.1 Filter rated for 150 fpm Face Velocity with 95 percent DOP efficiency; 6-inch filter depth.
    - 2.6.2 Filter rated for 250 fpm Face Velocity with 95 percent DOP efficiency; 12-inch filter depth.
    - 2.6.3 Filter rated for 150 fpm Face Velocity with 99.99 percent DOP efficiency; 6-inch filter depth.
    - 2.6.4 Filter rated for 250 fpm Face Velocity with 99.99 percent DOP efficiency; 12-inch filter depth.
  - 2.7 Activated carbon filters shall be constructed of epoxy-coated perforated steel trays containing the activated carbon. Individual trays shall mount in a gasketed side access housing. The unit shall have an initial resistance of 0.35 inch w.g. at 500 fpm face velocity.
  - 2.8 Electronic air cleaners shall consist of an electrostatic agglomerator section and a renewable fibrous glass collector. The unit shall provide a dustspot efficiency of 90 percent at 500 fpm face velocity. Typical operating resistance shall be 0.40 inch w.g.
  - 2.9 Dust collectors shall be the dry centrifugal type complete with integral blower, dust separator, and hopper.
  - 3.0 EXECUTION: Install filters in accordance with applicable sections of NFPA 70, 90A, and 90B.

**Tailpipe Exhaust Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of tailpipe exhaust equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Capacity and performance shall be based on standard air density (0.075 pound per cubic foot). Fans shall have a peak static efficiency of not less than 60 percent.
  - 2.2 Blowers and accessories shall comply with AMCA 210, 300, and 301. Fan impellers shall be constructed of heavy gauge steel and accurately balanced both statically and dynamically when installed in the assembled fan unit. Impeller and housing in the air stream shall be coated with neoprene, epoxy, phenolic resins, or other material suitable to resist the corrosive gases and temperatures encountered. Fans to be mounted on exterior of building shall be provided with weatherproof covers.
  - 2.3 Exhaust duct and fittings for vehicle tailpipe exhaust systems shall be constructed of galvanized sheet steel. Sheets shall conform to Fed. Spec. QQ-S-775, Class D or ASTM A 525. Ductwork shall be constructed with minimum metal gauge thickness and reinforced as required in the SMACNA Duct Construction Standards - Metal and Flexible.
    - 2.3.1 Tailpipe adapter shall be not less than 20-gauge corrosion-resisting steel. The adapter shall be of the tapered cone type with spring clip or other suitable device for exhaust pipe attachment.
    - 2.3.2 Flexible exhaust tubing shall be 0.012 minimum thickness galvanized sheet steel or heat-resistant, reinforced wire, fiberglass, and neoprene tubing.
    - 2.3.3 Dampers shall be of the circular disk type with quadrant locking device or blast gate type.
    - 2.3.4 A flexible tubing suspension system shall be furnished and installed for repaired tailpipe exhaust systems where no such suspension system exists. The flexible tubing suspension system shall suspend the flexible tubing overhead when not in use, allowing it to be lowered to the operating level, when required. The suspension system installed shall be complete with cable, pulleys, and operating mechanism.
- 3.0 EXECUTION:
  - 3.1 Ductwork joints in galvanized sheet steel ductwork shall be soldered or otherwise sealed. The lock seam in straight sections shall be located on top of the duct. Seams shall be suitable for 10-inch

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water gauge static pressure. Ductwork shall be constructed with minimum metal gauge thickness and reinforced as required in the SMACNA Duct Construction Standards - Metal and Flexible.

- 3.2 Weather-resistant finishes of items located outdoors shall meet the requirements of ASTM B 117.

**Ductwork and Accessories**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of ductwork and accessories. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Metal duct and equipment casings, housing, and plenums shall be fabricated in accordance with SMACNA Duct Construction Standards - Metal and Flexible and shall comply with NFPA 90A, 90B, and 91. Metal gauge shall generally be in accordance with SMACNA standards but in no case shall be less than existing duct gauge.
- 2.1.1 Galvanized steel shall comply with ASTM A 527 and with ASTM A 525 for zinc coating.
- 2.1.2 Black steel shall comply with ASTM A 569.
- 2.1.3 Aluminum shall comply with ASTM B 209.
- 2.1.4 Stainless steel shall comply with ASTM A 167.
- 2.2 Fibrous glass duct shall be fabricated in accordance with SMACNA Fibrous Glass Duct Construction Standards.
- 2.3 Flexible duct shall be in accordance with NFPA 90A and SMACNA Duct Construction Standards - Metal and Flexible and shall be UL listed.
- 2.4 Flexible connectors shall be in accordance with NFPA 90A and shall be UL listed.
- 2.5 Sealants shall be in accordance with SMACNA Duct Construction Standards - Metal and Flexible.
- 2.6 Hangers and supports shall be constructed of galvanized steel or other corrosion-resistant material in accordance with SMACNA Duct Construction Standards - Metal and Flexible.
- 2.7 Ductwork accessories shall be in accordance with SMACNA Duct Construction Standards - Metal and Flexible.
- 2.8 Paint for repair of galvanized surfaces shall comply with Mil. Spec. DOD-P-21035.
- 3.0 EXECUTION:
- 3.1 Ductwork: Damaged sections of duct shall be repaired by patching or by replacing complete sections. Work shall comply with the applicable sections of SMACNA Duct Construction Standards - Metal and Flexible, and NFPA 90A, NFPA 90B, or NFPA 91.
- 3.2 Flame Cutting: No cutting by torch or flame shall be done without authorization from the Authorized Member Representative.
- 3.3 Welding shall be performed in compliance with AWS D1.1.
- 3.4 Damage to galvanized coatings shall be repaired by application of galvanizing repair paint.

**Control and Fire Dampers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of control and fire dampers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 New control dampers may be of parallel or opposed blade design and shall be tested in accordance with the requirements of AMCA 500 for the specific performance characteristics required. Construction shall be in accordance with the requirements of SMACNA construction standards, as well as ASHRAE recommendations pertaining to construction of duct accessories.
- 2.2 New fire dampers may be of single blade, multi-blade, or curtain design and shall be tested in accordance with the requirements of UL 555. Fire dampers shall be UL listed and/or FM approved for their intended use. Fire dampers shall also conform to the requirements of the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems.

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3.0 EXECUTION:

- 3.1 Control damper installation and repair work shall be in compliance with applicable portions of details of construction, as shown in ASHRAE and SMACNA standards.
- 3.2 Fire damper installation and repair work for dampers in air conditioning and ventilating duct openings, through walls and floors, shall be in compliance with the requirements of NFPA 90A and the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems. Fire damper installation and repair work for dampers in wall openings without ducts shall be repaired or replaced in compliance with the requirements of NFPA 80, when such openings are not passageways.

**Sound Attenuators**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of sound attenuators. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Sound attenuators shall be constructed of galvanized steel with acoustical baffle as required to provide the desired attenuation. Methods for presenting sound attenuation data shall be consistent with the ASHRAE Handbook Series.
- 3.0 EXECUTION: Installation shall comply with the SMACNA duct construction standards.

**Control Devices for Mechanical Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of control devices for mechanical equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Controls may include sensors, transducers, controllers, controlled devices, and other accessories as required. Typical items include thermostats, humidistats, aquastats, controllers, control valves, dampers, specialized control packages, air supply packages, tubing, control wiring, and panels. Where a complete control system is replaced, all new control components shall be by the same manufacturer.
  - 2.2 Offeror may provide a computer workstation, only when designed to monitor specific data points, equipment or levels throughout the HVAC system. The workstation must meet the following minimum specifications; CPU will be 1ghz Pentium III (or equal) or higher, CD-ROM speed will be 36x, or higher, operating system will be Windows NT 3.51 or Windows 2000 (or equal) or higher, and will be preinstalled by offeror, systems will be Energy Star compliant, AC power adapter will be standard, minimum of 128MB of RAM or higher, 512KB level 2 cache, or better, 10 GB hard drive or better, Parallel port for connection to printer, 15" 1024x768 SVGA video display, or better, mouse or pointing device, full size standard keyboard, parallel Ink jet / Bubble Jet color printer, 300 dpi or better.
  - 2.3 Battery backup and surge suppression unit shall be included. This unit shall protect the connected equipment from electrical spikes, surges, brown outs and related problems. It shall also provide a minimum of 5 minutes battery power to allow for proper shutdown during electrical outages. The unit shall allow for the connection of at least two devices. The unit shall be manufactured by APC, or other well known manufacturers of equal or better quality.
- 3.0 EXECUTION:
  - 3.1 All control components other than those located in finished spaces shall be clearly tagged.
  - 3.2 Control valves shall be mounted horizontally with operator up unless otherwise directed by the Authorized Member Representative.
  - 3.3 Instrument air for pneumatic controls shall be clean, dry, oil-free compressed air.
  - 3.4 It shall be possible to group system alarms by type and category, with categories being subsets of each type.

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- 3.5 The system shall be programmed to dial at least 5 different digital pagers when selected alarms occur. Because the member may have multiple sites (now or in the future), the system shall send a minimum 3-digit code to pagers to identify the site where the alarm exists. The member will define these pager number and codes.
- 3.6 It shall be possible, based on time of day, date and holiday schedules to disable the alarm dial out to pagers.
- 3.7 System software will allow dial in from a remote location at a communications rate of 28.8 kbaud or higher.
- 3.7 The system shall have a user defined remote access password for protection against unauthorized dial-in to the system. This remote access password shall be different from passwords used by individual system operators for onsite access to the system.
- 3.8 System software shall log all incoming alarms, sorted by system site, in chronological order and shall store the last 250 alarms for each system site. The receipt of an alarm shall be announced by a visible screen indication and also by an audible beep. The visible and audible alarm indications shall continue until the alarm is acknowledged by the HVAC monitoring system operator. Alarms shall be stored in separate logs for each site.
- 3.9 Programming on global controllers shall reside in EEPROM or battery backed memory. The battery shall preserve programming for at least 15 days.
- 3.10 It shall be possible to enter or modify programming at all levels of the system, including UCs, while the system is operating by using the HVAC monitoring system to download programming over system communication lines. It shall also be possible to perform these same functions from a remote dial-in site as well.
- 3.11 The system software shall be capable of executing any control sequence that can be flow charted in a time sequential manner.
- 3.12 It shall be possible for the system operator to enter unique heating and cooling occupied set points for each zone.
- 3.13 It shall be possible to install just one outdoor temperature sensor on the system and use the value from that sensor for optimal start for all zones.
- 3.14 To perform an optimal start of a zone the software shall consider the outside temperature and the indoor zone temperature and shall calculate, based on the indoor/outdoor temperature difference and historical minutes/degree information for that particular zone, the amount of time required for a cool down or warm-up from the current zone temperature to the occupied zone temperature set point. The software shall then calculate the Optimal Start Time for the zone by beginning with the occupied time given in the time schedules and subtracting the time required for a cool-down or warm-up. The Optimal Start software shall then actually start the zone at the calculated Optimal Start Time.
- 3.15 All calculations for Optimal Start shall be totally automatic and self-learning and shall require no input from either the offeror or system operator.
- 3.16 For each a/c unit, the system shall produce an alarm if it takes too long for morning warm-up or cool-down. The amount of difference that will create an alarm shall be a global value for each typical a/c system and shall be programmable by the system operator. The purpose of this alarm is to identify a/c units that start unusually early thereby causing central plant equipment to run longer than necessary.
- 3.17 The system shall have a minimum of 10 security levels and 30 passwords. Each password shall consist of a minimum of 4 alphanumeric characters. Each password shall have a system operators name and a security level associated with it.
- 3.18 Passwords shall never be displayed on the monitor unless someone authorized to change passwords has logged onto the system and requested to see the passwords.
- 3.19 It shall be possible to assign one of the 10 security levels to each of the following system functions for the purpose of controlling access to those functions: Acknowledgement of alarms, creation or changing of time schedules, creation or changing of holiday schedules, viewing any field generated display, creation or changing of field generated displays, computer backup functions, assignment of point types, electric demand limiting, ddc software, energy logging, current alarm listing, alarm history, assignment of alarm types/categories to each point, viewing trendlogs, creation or

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- changing of trendlogs, computer peripheral configuration, changing system time and date, viewing transmission error summary, viewing or editing passwords or password assignments, viewing operator activity log.
- 3.20 The system shall have an operator activity log that automatically records all system operator activity. It shall time sequentially record all control actions taken at the system keyboard and shall record who took those actions. As a minimum, the system shall store the most recent 200 items of operator activity.
  - 3.21 If there is no keyboard activity for a period not greater than 15 minutes then the system shall assume the operator has forgotten to log off. The system shall automatically log off all operators currently logged in at the inactive terminal.
  - 3.22 A minimum of 100 different time schedules shall be available for controlling system functions based on time of day and type of day. It shall be possible to assign a nearly unlimited number of points to each time schedule. It shall be possible to assign a unique name of up to 40 characters to each time schedule to identify the purpose of the schedule.
  - 3.23 Each time schedule shall have room for a different set of entries for each of eight days, the 7 days of the week and a holiday. It shall be possible to have at least 6 on-off events per day.
  - 3.24 There shall be a minimum of 20 holiday schedules. A holiday schedule shall be a list of consecutive dates on which the holiday time schedule is applied.
  - 3.25 It shall be possible to assign a nearly unlimited number of points or a/c systems to each holiday schedule.
  - 3.26 For each individual digital output, analog output, or set point, it shall be possible to assign one time schedule and one holiday schedule.
  - 3.27 It shall be possible for the system operator to create dynamic full screen graphic displays on the system monitor. The system operator shall have complete control over the type and arrangement of information displayed. It shall be possible to display such static information as floor plans, piping and duct arrangements, equipment locations, etc. It shall also be possible to overlay dynamic information such as on/off status of points, temperatures, flow rates, etc on a static display. On any graphic it shall be possible to locate as many target points as desired within the physical space limits of the graphic.
  - 3.28 For floor plans, it shall also be possible for the owner to create static portions of graphic displays using AutoCAD and then use the system graphics capability to overlay dynamic data onto the imported AutoCAD displays.
  - 3.29 When the system operator initially displays a graphic on the screen the information shown on the graphic shall be current. This information shall be updated at any time by the system operator, by the simple push of a button. Dynamic graphic information shall automatically update at least once every thirty seconds.
  - 3.30 It shall be possible to link any one graphic to one or more different graphics through the use of target points. A target point is a physical location on a graphic on which a movable cursor can be located. When the cursor is positioned on a target point it shall be possible to display the graphic assigned to the target point by clicking on the point with a mouse.
  - 3.31 There shall also be a dedicated previous function key for the purpose of displaying the graphic that was most recently displayed prior to the currently displayed graphic. This function key will allow a system operator to step backwards in reverse order through a series of graphics that he has previously displayed.
  - 3.32 For any output point shown on a graphic, it shall be possible for the system operator to manually override the point to any desired value while simultaneously observing the graphic. Such commands shall include digital commands such as on/off and/or analog commands such as changes in set point values.
  - 3.33 As part of the initial system installation the system installer shall include, but not be limited to the following graphic displays; One for each fan coil or air handler or a/c unit, one for the central plant showing a/c system piping and automatic valves, one (or more) for each chiller showing all points of system interface, including open protocol points if applicable, site plan with target points on each building, one (or more if necessary) for each building showing room numbers with target points on each room.

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- 3.34 For wall mounted room temperature sensors it shall be possible for the system operator to program an independent override time in one hour increments up to at least 16 hours for each sensor override button. It shall be possible to program 10 hours override if no override from a sensor override button is authorized.
- 3.35 It shall be possible to assign more than one a/c unit to any one override button.
- 3.36 If equipment assigned to an override button is already on or in the occupied mode, due to either time schedules or a previous push of an override button, the system shall ignore additional user overrides.
- 3.37 If equipment assigned to an override button is off or in the unoccupied mode when the button is pushed then the equipment shall be commanded on or be switched to the occupied mode for the programmed override time period.
- 3.38 The system shall be able to simultaneously sample and store the values of at least 300 input-output points, either digital or analog. It shall be possible to program data sampling intervals over a range from one minute minimum to at least sixty minutes in one minute increments. It shall also be possible to program trend logs to sample only when an analog changes value by a minimum programmable amount, or when a digital point changes state.
- 3.39 The trend log for each input-output point shall store not less than 1500 samples. When a trend log becomes full the most recent samples shall continue to be stored and the oldest samples shall be dropped from the log as required to make room for the most recent samples.
- 3.40 It shall be possible for the owner to do an automatic a/c unit performance test. The test shall have 2 segments; a cooling segment and a heating segment. In the cooling segment, the heat is off and cooling is on 100%. In the heating segment, the cooling is off and the heat is on 100%. This test is intended to be applicable only for the typical a/c unit, not for kitchen makeup, central plant a/c, electrical rooms, or other non-typical systems.
- 3.41 Initiation of a performance test shall automatically enable the central plant, if applicable, and shall cause the plant to operate so that design water temperatures are produced during tests.
- 3.42 The maximum time for each segment shall be separately programmable by the Owner. The time for each segment shall be globally programmable for all a/c units by changing one point on the system display.
- 3.43 For each a/c unit, the system shall record and display the difference between room temperature and supply air temperature at the end of the heating and cooling segments of the most recent test as an indication of performance of the a/c unit.
- 3.44 It shall be possible for the system operator to enter a global alarm differential temperature set point for the heating segment. If the differential temperature attained is not greater than the alarm differential a heating alarm will occur. Likewise, it shall be possible to enter a global alarm differential temperature set point for the cooling segment. If the differential temperature attained is not greater than the alarm differential a cooling alarm will occur. The alarm differential temperature set point for cooling shall be initially programmed at 16°F. Thus if supply air temperature at the end of the cooling segment is not at least 16° below room temperature a cooling alarm will occur. The alarm differential temperature set point for heating shall be initially programmed at 20°F. Thus if supply air temperature at the end of the heating segment is not at least 20° above room temperature a heating alarm will occur.
- 3.45 It shall be possible for the system operator to manually prevent either segment of the full test, either heating or cooling, from occurring by simply operating a point on the system display.
- 3.46 To avoid setting an electrical demand peak, not all a/c units shall be tested at the same time. A/C units shall be placed in logical groups for purposes of this testing. While one group is being tested, other groups shall be prevented from testing. Tests shall be implemented one group at a time on command of the system operator. It shall also be possible to implement the test on one a/c unit at a time.
- 3.47 To avoid setting an electrical demand peak, not all a/c units shall be tested at the same time. A/C units shall be placed in logical groups for purposes of this testing. While one group is being tested, other groups shall be prevented from testing. Tests shall be implemented one group at a time on command of the system operator. It shall also be possible to implement the test on one a/c unit at a time.

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- 3.48 The system shall not perform a test unless the chilled water (CHW) and/or hot water (HW) supply temperature to the building is within design water temperature limits. Design temperatures shall be entered by the system installer and shall be changeable by the system operator. If during a test the CHW supply temperature rises more than two degrees above design, or if HW supply temperature drops more than five degrees below design, the system shall terminate the test and notify the system operator. Results of a test terminated due to inadequate water temperature shall not be recorded.
- 3.49 The system shall not start a heating segment unless the a/c units room temperature is less than 80°F at the start of the segment. The system shall not start a cooling segment unless the a/c units room temperature is greater than 75°F at the start of the segment. This start/no start decision shall be made automatically by the system on a unit by unit basis. If a unit is prevented from performing a segment by these temperature limits it shall have no affect on tests for other a/c units in the group, and the results of the previous test shall continue to be displayed for that a/c unit. If room temperature goes outside these limits after a segment has started the segment shall continue without interruption. These room temperature limits shall be global set points applicable to all a/c units. These set points shall be entered by the system installer and shall be changeable by the system operator.
- 3.50 The system shall monitor fan running hours on all fan coils, air handlers, and outside air fans, plus all central plant equipment such as pumps, cooling tower fans, and chillers. Either it shall be possible for the system operator to program maintenance alarms based upon calendar dates or running hours for all equipment start/stop controlled or status monitored by the system.
- 3.51 The system operator shall be able to create a maintenance work order for each item of controlled or status monitored equipment. To save programming time, it shall be possible to assign the same work order to more than one a/c unit or item of equipment. The work order shall automatically print when a maintenance alarm occurs on a unit to which the work order is assigned.
- 3.52 HVAC system software shall allow operation, programming and configuration of BACnet components along with non-BACnet components.
- 3.53 HVAC system software shall as a minimum support Point-to-Point (PTP) and either Ethernet or ARCnet BACnet LAN types. It shall communicate directly via these BACnet LANs as a native BACnet device. HVAC system software shall be of BACnet conformance class 6 and support all BACnet services.
- 3.54 Energy management software provided must provide direct digital control and monitoring of a wide range of HVAC equipment such as water chilling units, boiler systems, controlling pumps and cooling towers. Software must have the ability to control equipment from more than one manufacturer. If a software license is necessary to gain access to any equipment, the cost of that license [or password] will be included in any initial quotation to a Mohave member.
- 3.55 All components and systems being proposed may be based on the BACnet or comparable protocols. If the equipment being proposed is based on these protocols, please indicate that in the appropriate specification section and in the pricing information.
- 3.56 Any components being proposed using the BACnet protocol will comply with BACnet standard ANSI/ASHRAE 135-1995.
- 3.57 Any components, products or systems being proposed with the BACnet or comparable protocols will indicate the following information; conformance class supported (Class 1-6), functional groups supported, standard application services supported, standard object types supported; data link layer options, character sets supported, routing capabilities, property range descriptions and any other special information. Please include this information after the applicable performance specification.

**Testing and Balancing of HVAC Systems**

- 1.0 DESCRIPTION OF WORK: This specification covers testing and balancing of HVAC systems.
- 2.0 PRODUCTS: (Section not used.)
- 3.0 EXECUTION:
  - 3.1 Test and balance contractor shall be certified by the National Environmental Balancing Bureau (NEBB) or the Associated Air Balance Council (AABC).
  - 3.2 Certified test reports shall be submitted by the Contractor to the Authorized Member

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Representative. Test reports shall comply with the standards, listed below, of the selected test and balance association.

- 3.2.1 NEBB-01, Procedural Standards for Testing - Adjusting - Balancing of Environmental Systems.
- 3.2.2 AABC National Standards for Total System Balance (AABC MN-1).
- 3.3 Test and balance work shall be in accordance with the standards of the selected test and balance association. The work shall also comply with the recommendations of ASHRAE pertaining to instruments, measurements and procedures and with SMACNA-07, HVAC Systems - Testing, Adjusting and Balancing.
- 3.4 Systems shall be tested at near maximum load conditions. Cooling systems shall be tested in summer; heating systems shall be tested in winter.
- 3.5 Equipment settings including dampers, valves, and similar equipment shall be marked to show final positions at the completion of balancing.

**DIVISION 26-ELECTRICAL**

**Wiring Systems Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of wiring systems equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Copper Wire: ASTM B 3, ASTM B 8.
  - 2.2 Aluminum Wire: ASTM B 230, ASTM B 231.
  - 2.3 Busways and Fittings: UL 857, NEMA BU 1.
  - 2.4 Plugs and Receptacles: UL 498, NEMA WD 1 and NEMA WD 6.
  - 2.5 Conduit: ANSI C80.1, C80.3, and C80.5 and NEMA RN 1.
  - 2.6 Enclosures: NEMA ICS 6 and OS 1.
  - 2.7 Specific Purpose Wiring Devices: NEMA WD 1, NEMA WD 6.
  - 2.8 General Electrical: NFPA 70.
  - 2.9 Flexible Metal Conduit: UL 1.
  - 2.10 Surface Metal Raceways and Fittings: UL 5.
  - 2.11 Liquid-Tight Flexible Steel Conduit: UL 360.
- 3.0 EXECUTION:
  - 3.1 Coordination: Contractor shall determine that the wiring system has been de-energized. Before de-energization, the Contractor shall ensure that equipment served by the wiring system will not be damaged by the power outage.
  - 3.2 Clearances: Working clearances shall comply with NFPA 70.

**Motor Generator Sets**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of motor generator sets. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Batteries: SAE J537 and UL 1236, and IEEE 484 and 485, as applicable.
  - 2.2 Instrument Transformers: ANSI C12.11.
  - 2.3 Motor and Generator: NEMA MG 1 and MG 2.
  - 2.4 Battery Charger: UL 1236.
  - 2.5 Switchgear: NEMA SG 5.
  - 2.6 Electrical Instruments: ANSI C39.1.
- 3.0 EXECUTION:
  - 3.1 Coordination and Scheduling: Outages shall be scheduled and coordinated in advance with the

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Authorized Member Representative.

- 3.2 Protection: Take precautions to prevent injury to personnel and to avoid damage to equipment and other property in compliance with ANSI C2.
- 3.3 Maintenance, Repair, or Replacement Work: The Contractor shall check the generator sets in accordance with the manufacturer's instructions and Mil. Std. MIL-STD-705, MIL-HDBK-705, IEEE-43, IEEE-115, and SSPC-PA-1. As a result of the testing or for preventive maintenance, the Contractor shall maintain, repair, or replace any piece of equipment requiring work.

**Electrical Distribution System Substation Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of electrical distribution system substation equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: The maintenance and repair work shall include, but not be limited to the following major equipment:
  - a. Power Transformers.
  - b. Station Service Transformers.
  - c. Automatic Tap Changing Transformers.
  - d. Switchgear.
  - e. Oil Circuit Breakers.
  - f. Isolating Switches.
  - g. Metering Equipment.
  - h. Relaying Equipment.
  - i. Station Battery System.
  - j. Articulated Secondary Unit Substation.
  - k. Integral Transformer-Load Center.
  - l. Sulfur Hexafluoride (SF6) Circuit Breakers.
- 2.1 Power Distribution Panel: NEMA PB 1, U.L. 67.
- 2.2 Insulating Oil, Electrical (For Transformers, Switches, and Circuit Breakers): ASTM D 923.
- 2.3 Distribution, Power, and Regulating Transformers: ANSI 462 series as applicable.
- 2.4 Instrument Transformers: ANSI C57.13.
- 2.5 Installation and Maintenance of Oil-Immersed Transformers: ANSI/IEEE C57.12.00.
- 2.6 Voltage Air Switches, Bus Supports, and Switch Accessories: ANSI/IEEE C37.30, C37.34.
- 2.7 Low-Voltage AC Power Circuit Breakers: ANSI C37.50.
- 2.8 Electrical Analog Indicating Instruments: ANSI C39.1.
- 2.9 Primary Unit Substation: NEMA 201.
- 2.10 Secondary Unit Substation: NEMA 210.
- 2.11 Molded Case Circuit Breakers: NEMA AB1.
- 2.12 Watthour Meters: ANSI C12.10.
- 2.13 Switchboards, Dead Front Distribution: NEMA PB 2.
- 3.0 EXECUTION:
  - 3.1 Coordination and Scheduling: Outages shall be scheduled and coordinated in advance with the Authorized Member Representative.
  - 3.2 Protection: Precautions shall be taken to prevent injury to personnel and to avoid damage to equipment and other property in compliance with ANSI C2.
  - 3.3 Workmanship: Work shall be completed in accordance with NFPA 70.
  - 3.4 Interruptions: During interruptions, equipment and standby systems shall be provided to maintain existing electrical service.
  - 3.5 Fences shall be checked for security. Gates and locks shall be checked for proper operation and grounding.
  - 3.6 Oil Handling and Disposal: Oil and oil-contaminated materials shall be handled and disposed of to comply with the latest federal and state requirements.

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**Transformers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of transformers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Transformer assemblies and components for replacement purposes shall be designed for the same service as existing.
  - 2.2 Transformers covered under this specification are as follows:
    - 2.2.1 Dry Type Transformers.
    - 2.2.2 Instrument Transformers.
    - 2.2.3 Control Transformers.
    - 2.2.4 Grounding Transformers.
    - 2.2.5 Liquid-Filled Transformers.
- 3.0 EXECUTION:
  - 3.1 Safety: Take precautions in compliance with the National Electrical Safety Code (ANSI/IEEE C2); execute work in compliance with NFPA 70.
  - 3.2 Coordination: Coordinate the work schedule with the Authorized Member Representative.
  - 3.3 Repairs: Repair and retighten burnt or broken lugs, windings, loose bolts, nuts, and screws. Repair windings in accordance with NEMA ST 20.
  - 3.4 Testing: Perform electrical insulation tests to verify the integrity of any repairs prior to re-energization of the transformers, unless written permission is obtained from the Authorized Member Representative stating otherwise.
  - 3.5 Oil Handling and Disposal: Handle and dispose of oil and oil contaminated materials in compliance with the latest Environmental Protection Agency requirements.
  - 3.6 Deficiencies, Safety Hazards, and Code Violations: Should the Contractor find or observe any deficiency, safety hazard, or code violation in the existing electrical system, equipment, devices, or installations that is not indicated or specified to be corrected under the contract, it shall be promptly reported to the Authorized Member Representative. The Contractor may submit recommendations for correction of the deficiency, safety hazard, or code violation with his report.
  - 3.7 Additional Execution Requirements Specific to Each Type of Transformer:
    - 3.7.1 Dry Type Transformers:
      - 3.7.1.1 General: replacement transformers shall have a winding configuration identical to that of the existing transformer and shall comply with NEMA ST 20 and ANSI C57.12.22.
      - 3.7.1.2 Noise isolation pads shall be checked for excessive wear and replaced if necessary.
      - 3.7.1.3 Dust shall be cleaned from transformer winding and enclosure ventilation louvers.
    - 3.7.2 Instrument Transformers:
      - 3.7.2.1 Current transformers shall be manufactured in compliance with NEMA EI 21.1 and EI 21.2 and shall have an accuracy Class of 0.6 at burden designation of B-0.1 and B-0.2 and an accuracy of 1.2 at B-0.5 as defined in ANSI C57.13 for instrument transformers.
      - 3.7.2.2 Potential transformers shall have an accuracy of 0.3W, 0.3X, 0.3Y, 1.2Z as defined in ANSI C57.13 for instrument transformers.
      - 3.7.2.3 Fuses: Potential transformers shall be protected on the high and low voltage side by fuses.
      - 3.7.2.4 Repair: No attempt to repair current or potential transformers shall be made.
    - 3.7.3 Control Transformers:
      - 3.7.3.1 Core shall be in compliance with UL 506.
      - 3.7.3.2 Fuses: All ungrounded conductors of primary and secondary of potential transformers shall be protected by fuses.
      - 3.7.3.3 Repair: No attempt to repair control transformers shall be made.
    - 3.7.4 Grounding Transformers:
      - 3.7.4.1 Replacement zig-zag grounding transformers shall be three-phase zig-zag autotransformers or six single phase transformers connected zig-zag and shall comply with UL 506.
      - 3.7.4.2 Replacement Wye-delta grounding transformers shall be three-phase transformers or three single

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- phase transformers connected wye-delta and shall be in compliance with ANSI C57.12.00.
- 3.7.4.3 Core shall be in compliance with ANSI C57.12.00.
  - 3.7.5 Liquid-Filled Transformers:
    - 3.7.5.1 Replacement oil-filled transformers shall have a winding configuration identical to the existing transformer and shall comply with ANSI C57.12.00.
    - 3.7.5.2 Gaskets shall match existing type removed.
    - 3.7.5.3 Oil added to transformers shall be the same type as existing or shall be an oil recommended by the transformer manufacturer. Dielectric strength of oil shall not be less than 30 kV. Mineral oil shall comply with NEMA TR P8. Mineral oil shall not be added to high fire point oils such as askarel and silicone.
    - 3.7.5.4 Repair leaks by cleaning the leak area and welding or by applying 1/4-inch thick steel plate patch and welding in place. After welding, check the repaired area for leaks, reweld if leaking, reclean, and touch up with paint. Welding shall comply with AWS D1.1.
    - 3.7.5.5 Gaskets, vacuum and liquid level gauges found to be defective shall be replaced.
    - 3.7.5.6 Ground resistance test readings shall be performed across phase-to-phase windings and phase-to-ground windings. Tabulate results, and submit them to the Authorized Member Representative.
    - 3.7.5.7 Dielectric test shall be performed on oil samples taken from top and bottom filter press connections. Record and submit results to the Authorized Member Representative.
    - 3.7.5.8 Transformer liquid levels shall be checked for correct level and filled if low. Oil added to transformers shall be same type as existing oil or shall be an oil recommended by the transformer manufacturer. Dielectric strength of oil shall not be less than 30 kV. Mineral oil shall comply with ANSI/IEEE C57.91 and C57.92. Mineral oil shall not be added to high fire point oils such as askarel and silicone.
    - 3.7.5.9 Transformer tap connections and tap changer shall be tightened.
    - 3.7.5.10 Pressure of inert gas in cylinders used to maintain positive pressure inside transformer tank shall be checked. Replace cylinder if pressure fails below transformer manufacturer's recommended level for gas cylinder pressure.
  - 3.7.6 Outages and Testing of Transformers:
    - 3.7.6.1 Service interruptions shall be held to a minimum. De-energization will be accomplished by others.
    - 3.7.6.2 Preinstallation Test: Existing transformers that have undergone major maintenance and/or repair shall be subjected to insulation resistance tests and insulation high potential tests. The results of the tests shall be furnished to the Authorized Member Representative.
    - 3.7.6.3 Oil Test: Transformers shall have insulating oil tested.
    - 3.7.6.4 Insulation Test: Transformers shall have insulation tested.

**Electrical Distribution Transformers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of electrical distribution transformers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Poles-Mounted Transformers: ANSI/IEEE C57 series as applicable.
  - 2.2 Pad-Mounted Transformers: NEMA/IEEE C57 series as applicable.
  - 2.3 Transformer Oil for Oil-Filled Units: ASTM D 923.
- 3.0 EXECUTION:
  - 3.1 Outages shall be scheduled and coordinated in advance with the Authorized Member Representative.
  - 3.2 Protection: Take precautions to prevent injury to personnel and to avoid damage to equipment and other property in compliance with ANSI C2.
  - 3.3 Preventive Maintenance, Repair or Replacement Work: The Contractor shall perform all required tests in accordance with applicable codes and standards and the manufacturer's instructions. The Contractor shall perform preventive maintenance work, repair, replacement of any defective part, or furnish new material when required.

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- 3.4 Oil Handling and Disposal: Oil and oil-contaminated materials shall be handled and disposed of in compliance with the latest Environmental Protection Agency requirements. Oil tests shall be in accordance with ASTM standards.
- 3.5 Reports: Upon completion of the work, a report of the results of the tests made shall be furnished to the Authorized Member Representative.

**High-voltage Disconnecting Devices**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of high-voltage disconnecting devices. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Insulating Oil: ASTM standards applicable to the oil in use.
  - 2.2 General Electrical: ANSI/IEEE C2.
  - 2.3 Power Fuses and Fuse Disconnecting Switches: ANSI C37.46, NEMA SG 2.
  - 2.4 Automatic Circuit Reclosers For AC Systems: ANSI C37.60.
  - 2.5 Automatic Line Sectionalizers For AC Systems: ANSI C37.63, NEMA SG 13, ANSI C37.63.
  - 2.6 Power Switching Equipment: NEMA SG 6.
  - 2.7 Distribution Cutouts and Arrestor Combination Mounting: ANSI C37.36B, ANSI C37.42.
- 3.0 EXECUTION:
  - 3.1 Scheduling and Coordination: Contractor shall ensure that power interruptions have been scheduled and approved.
  - 3.2 Protection: Precaution, in compliance with ANSI/IEEE C2, shall be taken to prevent injury to personnel and to avoid damage to equipment and property.
  - 3.3 Oil Handling and Disposal: Oil and oil contaminated materials shall be handled and disposed of to comply with the latest federal and state regulations.

**Overhead Electrical Distribution Systems**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of overhead electrical distribution systems. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Conductors: ANSI C8.35, QQ-W-343; ANSI/IEEE C2, ASTM B 8, B 228, B 229, B 230, B 231, B 232; NEMA WC3, WC5, and WC7.
  - 2.2 Insulators: ANSI C29.1, C29.2, C29.3, C29.4, C29.5, C29.6, C29.7, C29.8, C29.9, and NEMA HV 2.
  - 2.3 Poles: ANSI 05.1; AWP A C4, C25, P1, P8, P9; and CSA A14.
  - 2.4 Crossarms: REA DT-5B, AWP A C25, ANSI C2, ANSI C135.33.
  - 2.5 Hardware: EEI TDJ-1, TD-2, TDJ-3, TD-4, TDJ-5, TDJ-6, TDJ-7, TDJ-9, TDJ-10, TD-11, TD-12, TDJ-17, TDJ-22, and TDJ-23 as applicable.
- 3.0 EXECUTION:
  - 3.1 Scheduling and Coordination: Contractor shall ensure that power interruptions and blocking of thoroughfares have been scheduled and approved.
  - 3.2 Line Clearing: Chemicals used in line clearing operations shall be in compliance with the latest federal and state requirements.
  - 3.3 Safety Precautions: Precautions shall be taken to prevent injury to personnel and to avoid damage to equipment and other property in compliance with ANSI/IEEE C2.

**Underground Electrical Distribution Systems**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of underground electrical distribution systems. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative.

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Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

- 2.1 Conductors: ASTM D 4727, ASTM D 1352, ASTM D 1679, ACIE NO. 1-68, ICEA NO. S-19-81, NO. S-66-524, and NO. S-68-516, NEMA WC 7 and NEMA WC 8, and UL 854, as applicable.
- 2.2 Conduits: NEMA TC 2 and NEMA TC 6, UL 6, UL 514B, and UL 543 as applicable.
- 2.3 Tape: U.L.
- 2.4 Insulators: ANSI C29 8 and C29 9.
- 2.5 General Electrical: ANSI C2, NFPA 70.
- 2.6 Testing: IEEE 48.
- 2.7 Concrete: Aggregate, ASTM C 33; Portland cement, ASTM C 150, Type 1; compressive strength 4,000 psi at 28 days.

3.0 EXECUTION:

- 3.1 Coordination: Contractor shall ensure that power interruptions and blocking of thoroughfares have been scheduled and approved.
- 3.2 Tests: All underground lines, splices, and terminations that have undergone maintenance, repair, or are new installation shall be tested before placement in service.
- 3.3 Ductbank: No dips or low points that retain water are permissible. Conduit shall be encased with not less than 3 inches of concrete when not direct-buried.
- 3.4 Manholes and Handholes shall be spaced and installed so as not to exceed the pulling tensions of the cables to be pulled. Maximum pulling tensions shall be as recommended by the cable manufacturer.

**Electrical Distribution System Grounding**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of electrical distribution system grounding. Products shall match existing materials and/or shall be directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS: (Section not used.)

3.0 EXECUTION:

- 3.1 Coordination and Scheduling: Contractor shall ensure that power interruptions have been scheduled and approved.
- 3.2 Outages: Service interruptions shall be limited in number and duration, and the extent of lines involved shall be held to a minimum.
- 3.3 Protection: Take precautions, in compliance with ANSI C2, to prevent injury to personnel and to avoid damage to equipment and other property.
- 3.4 Workmanship: Installation shall be in compliance with IEEE 80 and 142. Install protective molding, staples and conduit as recommended by these standards.
- 3.5 Trenching: Exercise care when digging trenches for installation or testing of ground equipment. Protect adjacent structures and properly shore excavations.
- 3.6 Grounding shall comply with NFPA 70, ANSI C2, and IEEE 80 and 142. Ground neutral conductors, cable shields, metallic cable sheaths and armor, metallic conduits, pothead bodies, junction boxes, lightning arresters, fence enclosures, and noncurrent-carrying metallic parts of equipment. Ground rods shall be made of copper, or copper-clad steel not less than 1-inch by 8 feet long and, except those installed in manholes, shall be driven into the earth at least 9 feet. Ground connections in earth shall not be backfilled until after inspection by the Authorized Member Representative. Repairs and maintenance of the grounding system shall include resistance measurements and tightening of all bolted connections.

**Electrical Distribution System Capacitor Banks**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of electrical distribution system capacitor banks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance

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with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Material: New capacitors shall comply with NEMA CP 1 and shall not use impregnant containing polychlorinated biphenyls (PCB).

3.0 EXECUTION:

3.1 Outages shall be scheduled and coordinated in advance with the Authorized Member Representative.

3.2 Protection: Take precautions to prevent injury to personnel and to avoid damage to equipment and other property in compliance with ANSI C2.

3.3 Maintenance and Repair Work: Workmen shall allow the capacitor time to discharge and then short capacitor terminals together and ground before touching any live parts. Capacitors shall be checked in accordance with NEMA CP 1 and NFPA 70. Perform the necessary preventative maintenance, repair, or replacement of any of the components.

3.4 Oil Handling and Disposal: Oil and oil-contaminated materials shall be handled and disposed of to comply with the latest Environmental Protection Agency requirements.

**Electrical Distribution System Voltage Regulators**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of electrical distribution system voltage regulators. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Material: New regulators shall comply with ANSI C57.15. New oil shall comply with ASTM D 923.

3.0 EXECUTION:

3.1 Outages shall be scheduled and coordinated in advance with the Authorized Member Representative.

3.2 Protection: Take precautions to prevent injury to personnel and to avoid damage to equipment and other property in compliance with ANSI C2.

3.3 Maintenance and Repair Work: All maintenance and repair work shall be accomplished and in compliance with applicable ANSI C57-series and ASTM standards.

3.4 Oil Handling and Disposal: Oil and oil-contaminated materials shall be handled and disposed of to comply with the latest Environmental Protection Agency requirements.

3.5 Test Reports on field tests made in compliance with ANSI C57.15 shall be submitted to the Authorized Member Representative.

**Interior Low-voltage Disconnecting Devices**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of interior low-voltage disconnecting devices. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Switch Box (Enclosed): UL 98.

2.2 Fuse Holders and Fuses: ANSI/UL 512, 198.2, 198B, and ANSI C97.1 as applicable.

2.3 Molded Case Circuit Breakers: NEMA AB 1.

2.4 General Electrical: NFPA 70.

3.0 EXECUTION:

3.1 Coordination: Contractor shall determine that the disconnecting device has been de-energized. Before de-energization, the Contractor shall ensure that equipment served by the disconnecting device will not be damaged by the power outage.

3.2 Clearances: Work clearances required by NFPA 70 shall be provided.

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**Panelboards and Load Centers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of panelboards and load centers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Panelboards: NEMA PB 1, and PB 1.1.
  - 2.2 Fuses and Fuse Holders: ANSI/UL 512, 198.
  - 2.3 Molded Case Circuit Breakers: NEMA AB 1.
  - 2.4 General Electrical: NFPA 70.
  - 2.5 Enclosures Beyond Repair: Replace with the same size and type in compliance with NEMA ICS. Carbon steel, ASTM A 366; stainless steel, ASTM A 176; galvanized sheet steel, ASTM A 526.
- 3.0 EXECUTION:
  - 3.1 Coordination: Contractor shall determine that equipment served by panelboards and load centers will not be damaged before or after power is cut off and that power to the panelboards and load centers has been disconnected or cut off.
  - 3.2 Clearances: Working clearances required by NFPA 70 shall be provided.
  - 3.3 Tests: All devices and systems that have undergone maintenance, repair, or are new installation shall be tested before placement in service.

**Electric Motors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of electric motors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 General: Parts shall be factory-made. Existing bolts and screws that are rusted, corroded, cross-threaded, or otherwise defective and are removed due to repair work shall be replaced with new bolts and screws.
  - 2.2 Motor assemblies and components for replacement purposes shall be designed for same service as existing. Repaired rotors shall be balanced. Brushes worn to within 20 percent of usable length shall be replaced with same type and size brushes.
  - 2.3 New motor shall be of like kind and of the same size, performance rating, and characteristics as the existing motor to be replaced and shall comply with NEMA MG 1 and UL 1004.
  - 2.4 Products included in these specifications are:
    - 2.4.1 Single Phase Induction Motor.
    - 2.4.2 Universal Motor.
    - 2.4.3 Polyphase Squirrel-Cage Induction Motor.
    - 2.4.4 Polyphase Wound Rotor Induction Motor.
    - 2.4.5 Polyphase Synchronous Motor.
    - 2.4.6 Direct Current Motor.
- 3.0 EXECUTION:
  - 3.1 Compliance: Take precautions in accordance with the National Electrical Safety Code. Workmanship shall be executed in compliance with NFPA 70.
  - 3.2 Scheduling and Coordination: Contractor shall determine that required notices have been given and that equipment served by the motor will not be damaged due to motor shutdown.
  - 3.3 Lubrication, Operation, and Adjustment: Before operational testing, thoroughly clean electric motor of all foreign material, and lubricate all electric motors or parts requiring lubrication with the types of lubricants recommended by the electric motor manufacturer.
  - 3.4 Deficiencies, Safety Hazards, and Code Violations: Should the Contractor find or observe any deficiency, safety hazard, or code violation in the existing electrical system, equipment, devices, or installations that is not indicated or specified to be corrected under the contract, it shall be

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promptly reported to the Authorized Member Representative. The Contractor may submit recommendations for correction of such deficiency, safety hazard, or code violation with his report.

3.5 Requirements Specific To Each Motor Type:

3.5.1 Single Phase Induction Motors:

3.5.1.1 Single phase Induction Motors shall comply with ANSI/IEEE 114.

3.5.1.2 Frame sizes shall comply with NEMA MG 13.

3.5.2 Universal Motors:

3.5.2.1 Armature: Core of armatures shall be built up of annealed and insulated laminations. Commutator shall be built up of hard drawn, hard rolled copper segments insulated from each other by mica in compliance with NEMA MG 1.

3.5.2.2 Armature assembly shall be dynamically balanced for smooth operation in compliance with NEMA MG 1.

3.5.2.3 Bearings shall be sleeve bearing or ball bearing type complying with NEMA MG 1.

3.5.2.4 Brushholders shall be in compliance with NEMA MG 1.

3.5.2.5 Brushes shall be in compliance with NEMA CB 1.

3.5.2.6 Shaft shall be in compliance with NEMA MG 1.

3.5.3 Polyphase Squirrel-Cage Induction Motors:

3.5.3.1 Polyphase squirrel-cage induction motors shall comply with NEMA MG 1.

3.5.3.2 Frame size shall comply with NEMA MG 13.

3.5.4 Polyphase Wound Rotor Induction Motors:

3.5.4.1 Polyphase wound rotor induction motor shall comply with NEMA MG 1.

3.5.4.2 Frame size shall comply with NEMA MG 13.

3.5.4.3 Brushes shall be in compliance with NEMA CB 1.

3.5.4.4 Stator shall be rewound with conductors of same gauge and material as the existing stator.

3.5.4.5 Rotor shall be rewound with conductors of same gauge and material as the existing rotor.

3.5.5 Polyphase Synchronous Motors:

3.5.5.1 Polyphase synchronous motor shall comply with NEMA MG 1.

3.5.5.2 Frame size shall comply with NEMA MG 13. •16480

3.5.5.3 Brushes shall comply with NEMA CB 1.

3.5.6 Direct Current Motors:

3.5.6.1 Armature core shall be built up of annealed and insulated laminations. Commutator shall be built up of hard drawn, hard rolled copper segments insulated from each other by mica in compliance with NEMA MG 1.

3.5.6.2 Armature assembly shall be dynamically balanced for smooth operation in compliance with NEMA MG 1.

3.5.6.3 Bearings shall be ball bearing or sleeve bearing type in compliance with NEMA MG 1.

3.5.6.4 Brushholders shall be in compliance with NEMA MG 1.

3.5.6.5 Frame size shall comply with NEMA MG 13.

3.5.6.6 Shaft shall be in compliance with NEMA MG 1.

3.5.6.7 Brushes shall be in compliance with NEMA CB 1.

3.6 Outages and Testing of Electric Motors:

3.6.1 Outages and service interruptions shall be held to a minimum. De-energization will be accomplished by station forces.

3.6.2 Preinstallation Test: Existing motors that have undergone major maintenance and/or repair shall be subjected to insulation resistance tests and insulation high potential tests. Furnish the results of the tests to the Authorized Member Representative.

**Recreational Vehicle (RV) Outlets**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of recreational vehicle outlets. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

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- 2.1 30A, 20A Receptacle Pedestal: Midwest No. U041GP4 or approved equal. Each recreational vehicle outlet shall be pedestal mounted with one 30A, 120V receptacle and one 20A, 120V duplex receptacle. Each receptacle shall be protected by a dedicated integrally mounted thermal magnetic circuit breaker. The 20A circuit breaker shall be of the ground fault circuit interrupter (GFCI) type. The unit mounting pedestal shall include loop feed lugs rated for at least 100A, 240 volts, and a wire size of 250 kcmil. Similar lugs shall be provided to accommodate the equipment grounding conductor. The complete assembled unit shall be U.L. listed and shall be NEMA 3R construction. The pedestal cover shall be readily removable and shall provide direct access to the loop feed lugs. Pedestal shall be pad mounted.
- 2.2 50A, 30A, 20A Receptacle Pedestal: Midwest No. U075GP4 or approved equal. Each recreational vehicle outlet will be pedestal mounted with one 50A, 240V receptacle, one 30A, 120V receptacle, and one 20A, 120V duplex receptacle. Each receptacle shall be protected by a dedicated integrally mounted thermal magnetic circuit breaker. The 20A circuit breaker shall be of the ground fault circuit interrupter (GFCI) type. The unit mounting pedestal shall include loop feed lugs rated for at least 100A, 240 volts, and a wire size of 250 kcmil. Similar lugs shall be provided to accommodate the equipment grounding conductor. The complete assembled unit shall be U.L. listed and shall be NEMA 3R construction. The pedestal cover shall be readily removable and shall provide direct access to the loop feed lugs. Pedestal shall be pad mounted.
- 2.2 Concrete Pad: Pad shall be 24-inches square, 6-inches thick. Exposed edges shall be chamfered 1-inch. Reinforcement shall be provided consisting of #4 steel placed 12-inches from each edge. Concrete shall be a minimum of 3000 psi at 28 days. Top of pad shall extend 1-inch above finished grade.
- 3.0 EXECUTION: Contractor shall comply with provisions of the National Electric Code.

**Poles for Street and Area Lighting Systems**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for poles for street and area lighting systems. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Wood Poles: ANSI 05.1 and shall be preservative-treated.
  - 2.2 Steel, Aluminum, and Concrete Poles: ASTM A 500, ASTM B 209, and AASHTO Standards.
  - 2.3 Steel Poles:
    - 2.3.1 Structural Steel: ASTM A 36.
    - 2.3.2 Zinc Coating: ASTM A 123.
    - 2.3.3 Poles shall be chemically cleaned after fabrication and shall be hot-dipped galvanized in compliance with ASTM A 123.
  - 2.4 Aluminum poles shall be of high-strength aluminum having a yield strength of 34,000 psi.
  - 2.5 Concrete Poles: Prestressed steel reinforced, cast type in compliance with ACI 318 and 437. Cement shall comply with ASTM C 150.
  - 2.6 Painting: Materials shall match that of existing or adjacent pole finish.
- 3.0 EXECUTION:
  - 3.1 Safety precautions shall comply with applicable requirements of the National Electrical Safety Code.
  - 3.2 Wood Pole Setting: In normal firm ground, minimum pole setting depths shall be as follows: for pole lengths of 20 feet, 25 feet, 30 feet, and 35 feet the minimum depth shall be 5 feet, 5 feet 6 inches, and 6 feet, respectively. For pole lengths up to 100 feet the minimum depth shall be 10 percent of length for both straight and curved lines, plus 2 feet for straight lines and 10 percent of length•16501 plus 2 feet 6 inches for curves and corners. In rocky or swampy ground, pole setting depths shall be respectively decreased or increased as required by local power company published standards and as approved by the Authorized Member Representative. In swampy ground, a bog shoe may be used.
  - 3.3 Wood Pole Inspections:
    - 3.3.1 Visually inspect standing wood poles for ground-line heart rot, aboveground heart rot, pole top

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- heart rot, shell rot, mechanical damage, eroded foundations, large splits, and lightning damage.
- 3.3.2 Coat surfaces with creosote-based wood preservative coating compound and wrap with impregnated felt bandage in compliance with wood pole preservative materials supplier's instructions.
  - 3.4 Wood Pole Decay Maintenance:
    - 3.4.1 Ground-line heart rot shall be treated with an approved fumigant.
    - 3.4.2 Wood poles with surface decay below grade shall be replaced with new poles.
  - 3.5 Concrete Repair: Repair spalling in pole foundations and concrete poles by thoroughly coating with 2,000 psi shear strength epoxy resin, applying 3,000 psi 28-day concrete, and finishing to restore original configuration of the concrete.
  - 3.6 Steel Pole Maintenance: Steel poles that are corroded shall be chemically cleaned of rust and scale and painted.

**Ballasts and Transformers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of luminaire ballasts and transformers. Products shall match existing materials and/or shall be directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Constant-current transformers shall be of the automatic, moving-coil types designed to maintain the secondary current within 1 percent of rating when operating under normal loading conditions. A protective relay that will automatically disconnect the transformer from the line on open series circuit shall be provided as an integral component of the transformer. Transformers shall be rated 10 kW, 2,400 volts, 60 hertz primary and 6.6 amperes secondary.
  - 2.2 Fluorescent ballasts shall be high-power factor type, Class P rated, and CBM certified, rated for single or two-lamp operation. Ballasts shall be lead type for minimum starting temperature of plus 50 F.
  - 2.3 High-intensity discharge ballasts shall be high-power factor, single lamp type. Ballasts shall be Type 2, weatherproof for outdoor use.
  - 2.4 Lamp Ballasts: ANSI C82.1, C82.4, UL 935, and UL 1029 as applicable.
  - 2.5 Series isolation transformers for airfield lighting systems shall be equal to the original transformers in accordance with Air Force Manual (AFM) 14, Part II, Visual Air Navigation Facilities.
  - 2.6 Transformers, regulators and reactors shall be in compliance with the requirements of NEMA/IEEE C57.
- 3.0 EXECUTION: Contractor shall comply with provisions of the National Electric Code.
- 3.1 Maintenance and repair of regulators shall include cleaning or replacement of dirty or burned contacts, replacement of worn or broken mechanical parts and electrical insulation, cleaning and tightening connections, replacement of leaking seals and gaskets, replacement of burnt oil, stopping of tank leaks, securing of loose or broken mounts, repair of shorted windings, and testing of regulator against varying loads and for shorts and high resistances.
- 3.2 Temporary wiring modifications shall be made in order that the lighting system shall remain in operating condition, except for the item being repaired or replaced, during normal lighting periods.
- 3.3 Outages: Service interruptions shall be scheduled in advance with the Authorized Member Representative.

**Street and Area Lighting Controls**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for street and area lighting controls. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Photo controls shall be of the light-sensitive photo conductor cell type with integral line resistor and

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- relay circuit having a line voltage circuit contact and capacitor and an across-the-line protective lightning arrester. Plug-in locking type shall be in compliance with UL 773.
- 2.2 Replacement relay for control of circuit shall match mounting, voltage, and wattage of existing relay.
  - 2.3 Electronic control units shall be solid-state, transistorized, printed circuit type having no operating moving parts.
  - 3.0 EXECUTION:
  - 3.1 Temporary wiring modifications shall be made in order that the lighting system shall remain in operating condition during normal lighting periods, except for the control unit being repaired or replaced.
  - 3.2 Photo controls, timers and electronic control units shall be inspected for proper operation and repaired or replaced as required.
  - 3.3 Safety: Contractor shall comply with applicable provisions of the National Electric Code.

**Luminaires**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of luminaires. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Lamps: ANSI C78 series, C79 series.
  - 2.2 Fixtures: UL 781, 844, 595, 1570, 1571, 1572.
  - 2.3 Lamp Bases and Holders: UL 496, 542, and ANSI C81 series.
  - 2.4 Ballasts: UL 935, 1029, and ANSI C82 series.
  - 2.5 General Electrical: NFPA 70.
  - 2.6 All luminaires shall be designated "IES distribution type" as referred to in the IES Lighting Handbook.
    - 2.6.1 Luminaires shall be adjusted to achieve lighting levels and patterns specific to the application as recommended by the manufacturer. Each luminaire shall bear the UL label.
    - 2.6.2 Only the luminaire being repaired or replaced shall be disconnected from its source of supply during the normal operating hours of the lighting system.
    - 2.6.3 Luminaire heads or housings shall be die-cast aluminum with slip-fitter mounting and provided with 1-1/4 inch through 2-inch slip-fitter fittings. Luminaire heads shall have standard dimensions for interchangeable standard optical assemblies. Heads shall be internally wired and rated at 600 volts.
    - 2.6.4 Enclosed luminaire shall consist of an Alzak-finished aluminum reflector and enclosing refractor mounted on a standard luminaire head.
    - 2.6.5 Open luminaires shall consist of an Alzak-finished aluminum reflector with shielding reflector on house side providing IES Type I distribution, mounted on a standard luminaire head.
  - 2.7 Incandescent Luminaires:
    - 2.7.1 Luminaires shall be enclosed type for filament lamps with IES Type I distribution and shall have a glass refractor providing IES Type I distribution.
    - 2.7.2 Floodlights shall be enclosed type with adjustable support brackets. Enclosed floodlights shall be Class HD having a beam spread of 10 to 18 degrees. Open type floodlights shall have a beam spread of 70 to 100 degrees.
  - 2.8 Fluorescent luminaires shall be the enclosed type.
  - 2.9 High intensity discharge luminaires shall be enclosed type for HID lamps with IES Type I distribution. Enclosed luminaires shall have an enclosing glass refractor providing IES Type I distribution.
- 3.0 EXECUTION:
  - 3.1 Protection: Take precaution in accordance with ANSI C2.
  - 3.2 All service interruptions shall be scheduled in advance with the Authorized Member Representative.
  - 3.3 Workmanship: NFPA 70.

**Uninterruptible Power System (UPS)**

Attachment 1: Specifications for the Work

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of uninterruptible power systems. Products shall match existing materials or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Batteries: NEMA PE 1 for safety requirements and IEEE 485 for sizing.
  - 2.2 Battery Charger: UL 1236.
  - 2.3 Switchgear: NEMA SG 5.
  - 2.4 Emergency and Standby Power Systems: IEEE 446.
- 3.0 EXECUTION:
  - 3.1 Coordination and Scheduling: Outages shall be scheduled and coordinated in advance with the Authorized Member Representative.
  - 3.2 Protection: Take precautions to prevent injury to personnel and to avoid damage to equipment and other property in compliance with ANSI/IEEE C2.
  - 3.3 Maintenance, Repair or Replacement Work: The Contractor shall check the UPS in accordance with the manufacturer's instructions and Mil. Std. MIL-STD-202 and IEEE 446. If instructed by the Authorized Member Representative, the Contractor shall check for electromagnetic compatibility in accordance with Mil. Std. MIL-STD-461 and MIL-STD-462. As a result of the testing or for preventive maintenance, the Contractor shall maintain, repair, or replace any piece of equipment requiring work.

**Cathodic Protection of Steel Water Tanks**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for the repair and maintenance of cathodic protection of steel water tanks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Contractor's Qualification: A qualification such as NACE accredited corrosion specialist or a Senior Corrosion Technologist is required to perform or to supervise the inspection of the cathodic protection system. The contractor making the repair and installing new equipment, material, or components shall be under the direct supervision of a NACE accredited corrosion specialist or a Senior Corrosion technologist with a minimum of five years of experience in design and installation of cathodic protection systems for steel water tanks.
  - 2.2 Approval: All repair or replacement material and equipment shall be NACE approved.
- 3.0 EXECUTION:
  - 3.1 Inspection: The inspection of the cathodic protection system shall be made in compliance with applicable NACE standards. The inspection shall include a potential profile of the submerged structures together with visual and electrical tests.
    - 3.1.1 Tank-to-Water Potential Tests: Adjust the rectifier voltage or amperage so as to satisfy design current densities or specified voltage. Document readings, and note any reading below-0.85 volts versus the copper-copper sulfate half-cell or silver-silver chloride half-cell (using conversion chart). Successive potential readings shall be made with the tank full of water and the reference electrode placed at various depths, starting at 1 foot below the surface of the water and continuing at 3-foot intervals to the bottom of the tank. (A vertical inspection profile shall be taken along the wall between each anode string.) The tank bottom shall also be traversed equidistant from all distributed anodes. Inspect risers by placing reference electrode along the side wall of the riser and measuring at 3-foot intervals as far as possible.
    - 3.1.2 Polarization of the submerged steel surfaces to a tank-to-water potential shall be at least a negative 0.85 volts.
    - 3.1.3 Voltage Measurements Between Tank and Electrode: When inspecting new well-coated tanks, the voltage measured between the tank and reference electrode that is placed at any point along the coated surface shall not exceed negative 1.2 volts.

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- 3.1.4 The rectifier shall be free from any restriction that inhibits free air circulation. Keep air-cooled rectifiers free from dust accumulation, clogged filters or screens, brush, grass, or nests. Fill oil-cooled rectifiers to the proper level, and change the oil when it becomes cloudy. Dispose of oil that is removed as directed by the Authorized Member Representative.
- 3.1.4.1 Output Measurement: Measure and record the current and voltage output. Compare the readings obtained against the previous readings.
- 3.1.4.2 Stack Tests: Inspect the semi-conductor stacks to ensure that they are functioning properly and have not exceeded their useful life. The two quantities that shall be measured are reverse current leakage and forward voltage drop. When either of these values increase beyond limits set by the components manufacturer, replace the stack.
- 3.1.4.3 Meter Tests: Check the meters in the rectifier for accuracy by using portable instruments (voltmeter and ammeter) of known accuracy.
- 3.1.5 Visual inspection of the water tank shall be conducted while the Contractor is inspecting the anodes and wiring. At the direction of the Authorized Member Representative, lower the water level to expose as much of the wiring as practical to inspect for deteriorated insulation, faulty connections, etc. Inspect the interior surface for condition of coating and apparent rust or calcareous build up. In systems using permanent anodes, determine if the anode shall last until the next inspection. Record broken, damaged, and missing anodes. Inspect wiring to the anodes. Replace wire that has deteriorated insulation.
- 3.1.6 Reference electrodes and connecting wires shall be inspected by the Contractor to determine whether they are capable of operation until the next annual inspection.
- 3.1.7 Reports: Record and submit all data. Corrosion control records shall follow recommendations found in NACE RP0169.
- 3.2 Maintenance and Repair:
  - 3.2.1 Compliance: The maintenance, repair, and installation of replacement materials shall be in compliance with accepted NACE practices. Install all materials and equipment in compliance with the recommendations of NACE or the manufacturer or to comply with the contract documents. Contractor shall replace all broken, missing, deteriorated, or otherwise unserviceable components determined during inspection.
  - 3.2.2 Workmanship: The maintenance, repair, and installation of repair materials shall be under the supervision of the Contractor's NACE Accredited Corrosion Specialist or Senior Corrosion Technologist. Installation shall be performed by personnel who are specifically trained in this work by the manufacturer and who are engaged full time in the installation and servicing of cathode protection equipment. Electrical work shall be in compliance with the requirements of the National Electrical Code.
  - 3.2.3 Testing Methods: Upon completion of repair, the Contractor shall test, adjust, and place in service the cathodic protection system by the following methods:
    - 3.2.3.1 Testing: Adjust the voltage of the rectifier so as to cause a sufficient current to flow to polarize all parts of the structure to at least -0.85 volts. With a given amount of current flowing, voltage measurement shall be made from the tank to a copper-sulfate reference electrode in contact with the water. Successive potential readings shall be made with a calibrated voltmeter, with the tank full of water and the reference electrode placed at various depths starting at 1 foot below the surface of the water and continuing at 3-foot intervals to the bottom of the tank. The tank bottom shall also be traversed and readings taken every 3 feet in a single horizontal direction. In making these tests, place the reference electrode midway between two tank anodes and suspend close to, but not touching, the side or bottom of the tank. The distance between the reference electrode and the wall shall not exceed 1 inch for all readings. If any parts of the structure register voltages more negative than minus 1.2 volts, note this in a deficiency checklist.
    - 3.2.3.2 Rectifier Adjustment: Final adjustment of the rectifier output current shall be made so that repeated voltage readings taken as specified above for testing fall between the limits of minus 0.75 to minus 1.2 volts when measured against the reference electrode.
    - 3.2.3.3 Signs: The Contractor shall paint or stencil his name, date of inspection of the system, and due date of next inspection at a place on site designated by the Authorized Member Representative.
    - 3.2.3.4 Reports: After final adjustment, place the cathodic protection system in service, record the

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conditions of the system as left by the Contractor, and submit the report to the Authorized Member Representative.

- 3.3 Operating and Maintenance Instructions: The Contractor shall contribute technical data to the cathodic protection records file maintained by the installation. These technical records shall include such items as: manufacturer's data on installed equipment, operating instructions, lists of repair parts, names and addresses of sources of parts and services, current price lists, repair and maintenance instructions, and construction specifications and shop drawings. When the system has been modified or new components have been added, the Contractor shall prepare and furnish the Authorized Member Representative two complete sets of typewritten or printed instructions covering the maintenance and operation of the installation. The instructions shall cover proper adjustment of the direct current flow, a brief description of cathodic protection principles, a single line operating diagram, anode consideration with reference to local freezing conditions, troubleshooting checklists, and any other pertinent information concerned with the proper care and maintenance of the installation.

**Cathodic Protection System for Underground Utilities**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of cathodic protection systems for underground utilities. Products shall match existing materials accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Contractor's Qualification: A qualified person, such as a NACE-accredited Corrosion Specialist or a Senior Corrosion Technologist, is required to perform or supervise the inspection of the cathodic protection system. The contractor making the repair and installing new equipment, material, or components shall be under the direct supervision of a NACE accredited corrosion specialist or a Senior Corrosion technologist with a minimum of five years of experience in design and installation of cathodic protection systems for underground piping systems.
  - 2.2 Standard Products: Materials and equipment to be used in the repair or replacement of a cathodic protection system shall be a product of a manufacturer regularly engaged in the manufacture of the product, shall meet the NACE requirements, and shall essentially duplicate materials and equipment that have been in satisfactory use at least two years.
- 3.0 EXECUTION:
  - 3.1 Inspection: A complete inspection of the system shall be made in compliance with NACE RP0169. All findings shall be made in the form of a written report as directed by the Authorized Member Representative.
    - 3.1.1 Sacrificial (Galvanic) Anode System: Inspect foreign or neighboring structures to determine if a structure is being made more positive by the cathodic protection system. When structure-to-soil (electrolyte) potentials indicate that a neighboring structure is being made more positive, bonding shall be required to avoid damage. Inspect all underground metallic structure within 100 feet of the anode.
    - 3.1.2 Impressed Current (Rectifier Ground Bed) System:
      - 3.1.2.1 Component Inspection: Make inspection of the individual components to ensure that all parts are operating properly. The inspection shall include, but not be limited to, checking unevenness of the temperature or the stacks, hot or warm joints or contacts, arc burn paths, discolored insulators, watt-hour meter for creep, poor insulation, faulty lightning arresters, fuses, and cleanliness of the rectifier stack.
      - 3.1.2.2 Stack Tests: Inspect the semi-conductor stacks to ensure that they are functioning properly and have not exceeded their useful life. The two quantities that shall be measured are reverse current leakage and forward voltage drop. When either of these values increase beyond limits set by the components manufacturer, replace the stack.
      - 3.1.2.3 Interference Tests: Inspect foreign or neighboring structures to determine if a structure is being made more positive by the cathodic protection system. When structure-to-soil potentials indicate that a neighboring structure is being made more positive, the Contractor must make recommendations in report to avoid damage. Inspect and test all underground metallic structure

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within 1000 feet of the ground bed and all crossings of the protected structure. Test stations shall be provided at all crossings.

- 3.2 Maintenance and Repair: After the installation of anodes, the Contractor shall inspect the system and reinspect it again 2 to 4 weeks later. In the event that the system, when repaired, will not provide the required protection, as evidenced by the final tests and measurements, the Contractor, together with the Authorized Member Representative, shall determine the cause of the deficiency and the corrective measures necessary. After the necessary corrective measures have been determined, the contract may be modified as required. All repair or replacement material/equipment shall be NACE approved and similar to original materials. Installation shall be in compliance with the recommendations of the manufacturers as approved by the Authorized Member Representative to comply with the contract documents. Replacement materials that are installed shall comply with the applicable portions of NACE RP0169.
  - 3.2.1 Sacrificial (Galvanic) Anode System:
    - 3.2.1.1 General: Replacing anodes includes boring the hole or trenching, installing the anode, welding or splicing the electrical lead, adjusting the output, and installing test stations. Replacement of anodes shall comply with installation procedures found in NACE RP0169.
    - 3.2.1.2 Anode Output Adjustment: If required, install a resistor or resistance wire to prevent the anode from delivering excess current. The resistance wire, if used, shall be a nichrome wire, No. 16 or 22 AWG with type TW insulation.
    - 3.2.1.3 Placing the System into Service: Upon completion of all phases of the cathodic protection system, it shall be checked and adjusted for optimum performance before placing in regular service.
  - 3.2.2 Impressed Current (Rectifier Ground Bed) Systems:
    - 3.2.2.1 General: Replacing anodes includes boring the hole or trenching, installing the anode, welding or splicing the electrical lead, adjusting the output, and installing test stations. Replacement of anodes shall comply with installation procedures in NACE RP0169.
    - 3.2.2.2 Installation: Install anodes similarly to the anodes in the initial installation. Replacement anodes are normally installed in auger-bored holes drilled adjacent to the damaged or deteriorated anode. Install anodes below the center line of the protected structure. Anodes may be emplaced horizontally if obstructions are encountered. Backfill material shall consist of coke breeze compacted in 6-inch layers. Foreign material shall be excluded from the backfill.
    - 3.2.2.3 Electrical Splices and Connections: Negative cable connections shall be thermit-welded in compliance with the weld manufacturer's instruction. Cover the connection with an approved backfill shield placed over the weld connection. The shields shall be sized to cover the exposed metal.
    - 3.2.2.4 Placing the System into Service: Upon completion of all phases of the cathodic protection system, it shall be checked and adjusted for optimum performance before placing in regular service.
    - 3.2.2.5 Interference Testing: Make interference testing on all structures installed under this contract to locate damage being caused by existing or new impressed current cathodic protection systems or other sources of interference. It shall be the Contractor's responsibility to correct all interferences.
- 3.3 Maintenance and Operating Instructions: The Contractor shall contribute technical data to the cathodic protection records file maintained by the installation. These technical records shall include such items as manufacturers' data on installed equipment, operating instructions, lists of repair parts, names and addresses or sources of parts and services, current price lists, repair and maintenance instructions, construction specifications and shop drawings, and as-built drawings of the system.
  - 3.3.1 Consolidation of Records: The Contractor shall consolidate all cathodic protection records including surveys, inspections, operating data, maps, charts, location of leaks (leak maps), and manufacturers' parts manual.
  - 3.3.2 Updating Records: Update existing cathodic protection location maps to show any changes in location or addition of test points or stations, anodes, wiring, etc.
  - 3.3.3 Manuals: When the system has been modified or new components have been added, the Contractor shall prepare and furnish the Authorized Member Representative six copies of operation and maintenance manuals of the cathodic protection system for guidance of using agency personnel. Prepare manual with contents as determined by the Authorized Member Representative.

**Lightning Arresters**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of lightning arresters. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Arresters shall comply with ANSI/IEEE 28 and ANSI C62.2.
- 3.0 EXECUTION:
- 3.1 Scheduling and Coordination: Contractor shall ensure that power interruptions have been scheduled and approved.
- 3.2 Workmanship shall be in compliance with ANSI C2.
- 3.3 Cleaning: Clean work areas and materials of dirt, grime, grease, and debris.
- 3.4 Expulsion Arresters shall be inspected for depleted fiber material and thin walls. Report deficiencies to the Authorized Member Representative.

**Institutional Electric Heating Equipment**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of institutional electric heating equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Controls: NEMA DC 4, UL 20, UL 917, and UL 1020.
- 2.2 Heaters: UL 499.
- 2.3 General Electrical: NFPA 70.
- 2.4 Asbestos Usage: Materials containing asbestos shall not be used if nonasbestos materials are available.
- 3.0 EXECUTION:
- 3.1 Coordination: Contractor shall determine that heating equipment has been de-energized. Temporary heaters shall be supplied if required to maintain temperature.
- 3.2 Motor Repair: Electric motors to be repaired shall be done by a shop specializing in the repair of motors.

**Electric Unit Heaters**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of electrical unit heaters. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Heating element shall have nickel-chromium wire packed in high purity magnesium oxide enclosed in a corrosion-resistant sheath. The embedded sheath shall be the manufacturer's standard design.
- 2.2 Housing shall be fabricated from sheet steel complying with ASTM A 569. The housing shall be provided with means for suspension. Deflector blades shall be constructed of same material as housing and shall be manufacturer's standard design and operation.
- 2.3 Fan shall be the propeller type fabricated of aluminum or steel.
- 2.4 Controls:
- 2.4.1 Thermal overload cutout of the manual reset type shall be provided to disconnect elements in the event normal operating temperatures are exceeded.
- 2.4.2 Thermostat shall be unit or wall mounted and shall be heavy-duty type with enclosed contacts as specified by the manufacturer, with a 3-position selector switch to permit manual fan operation independent of temperature control. Control circuit voltage shall not exceed 30 volts as provided by a factory-installed control circuit transformer.

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- 2.5 Asbestos usage: materials containing asbestos shall not be used if nonasbestos materials are available.
- 3.0 EXECUTION:
- 3.1 Coordination and Scheduling: Contractor shall ensure that power interruptions have been scheduled and approved.
- 3.2 Workmanship: Installation work shall be in compliance with the National Electric Code.

**DIVISION 27-COMMUNICATIONS**

**Fiber Optic Cable Transmission System**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of fiber optic transmission system. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Fiber Optic Cable: EIA 455-25B, EIA 455-30B, EIA 455-33A, EIA 455-41A, EIA 455-46A, EIA 455-47B, EIA 455-51A, EIA 455-53A, EIA 455-61, EIA 455-65, EIA 455-81A, EIA 455-82B, EIA 455-88, EIA 455-91, EIA 455-104A, EIA 455-170, EIA 455-171, and EIA 455-177A, as applicable.
- 2.2 Fiber Optic Receivers: EIA 170, EIA 232E, and EIA 485 as applicable.
- 2.3 Fiber Optic Transmitters: EIA 170, EIA 232E, and EIA 485 as applicable.
- 2.4 Fiber Optic Modems: EIA 232 E and EIA 485 as applicable.
- 2.5 Fiber Optic Connectors: EIA 455-13. Connectors shall be of stainless steel.
- 2.6 Fiber Optic (FO) Repeaters: For simplex circuits, the repeater shall consist of an FO receiver connected to an FO transmitter. For Duplex circuits, the repeater shall consist of a pair of FO receivers that are connected to a pair of FO transmitters.
- 2.3 Fiber Optic Transceivers: EIA 170, EIA 232E, and EIA 485 as applicable.
- 2.8 Enclosures: NEMA 250.
- 3.0 EXECUTION: Contractor shall comply with provisions of the National Electric Code.

**Central Monitoring, Control and Instrumentation**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of central monitoring, control, and instrumentation equipment. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Drawings and Data: Drawings and data on existing monitoring control and instrumentation equipment should be requested from the Authorized Member Representative.
- 2.2 Sensing Elements or Transducers: Devices that sense the condition, state, or value of a process variable and produce an output that reflects that condition.
- 2.3 Measurement and Signal Conditioning: Devices that condition and transmit the signal generated by the sensing element and transducers.
- 2.4 Control Devices: Include any device that performs a definite function in control system, such as any switch (limit, pressure, temperature, on-off, etc), valves, solenoid, relays, and solid-state control elements.
- 2.5 Central Monitoring and Control Devices: Include any device that either monitors the signal generated by the transmitters or control devices (indicators, recorders, annunciators, etc.) or provides a final control action from the signal generated by the transmitter such as controllers, computers, etc.
- 2.6 Product Codes and Standards:
  - 2.6.1 Safety Requirements for Electrical Measuring and Controlling: ANSI C39.5.
  - 2.6.2 Industrial Control Equipment: ANSI/UL 508.

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- 2.6.3 Electrical Analog Indicating Instruments: ANSI C39.1.
- 2.6.4 Instrument Transformers: ANSI C57.13.
- 2.6.5 Industrial Controls and Systems: NEMA ICS.
- 2.6.6 National Electrical Code: NFPA 70.
- 2.6.7 Limit Controls: UL 353.
- 2.6.8 Test Code for Industrial Controls: IEEE 74.
- 2.6.9 Master Test Code for Resistance Measurement: IEEE 118.
- 2.6.10 Master Test Code for Electrical Measurement in Power Circuits: IEEE 120.
- 2.6.11 Dynamic Response Testing of Process Control Instrumentation: ISA S26.

3.0 EXECUTION:

- 3.1 Protection: Take precautions to prevent injury to personnel and to avoid damage to equipment and other property in compliance with ANSI/IEEE C2.
- 3.2 Power supplies that may be a hazard during the performance of the work shall be locked out.
- 3.3 Testing: Check the operation of each instrument after it is returned to service. Adjust each instrument to operate properly over the design range.
- 3.4 Report: A final report shall be prepared after the maintenance, repair, or replacement has been accomplished. A list of all equipment worked on, the service performed on each piece of equipment, and calibration data shall be included in the report. The report shall be typed and furnished to the Authorized Member Representative.

**DIVISION 28-ELECTRONIC SAFETY & SECURITY**

**Intrusion Detection System**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of plant, labor, equipment and material and installation of intrusion alarm systems. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Motion Detector: Detectors used in the system shall be passive infrared (ceiling mount) or combination microwave/passive infrared (wall mount) and shall have adjustable sensitivity. Detectors shall have built-in tamper protection and have a visual alarm indicator. Sensitivity shall be 2 to 4 steps within field of view.
  - 2.2 Balanced Magnetic Switches: Switch mechanism shall be of the balanced magnetic type that opens and crosses, or opens and grounds the circuit when actuated and have 24-hour tamper protection. To prevent welding of the contacts, each reed-type switch shall be provided with an overcurrent capacity. Switches shall be rated for a minimum lifetime of one million operations. Switches and magnets shall be in enclosures made of nonferrous metal. The switch mechanism shall be internally adjustable so that the operating gap between faces of the switch housing and the magnet container may be adjusted from 1/4 inch to 1 inch to accommodate installation variances. Switch boxes shall be the hub type or shall have threaded bodies. Stainless steel screws shall secure covers of cast-aluminum switch boxes. Covers of magnet housing shall not be readily removable. The balanced magnetic switches for doors shall be Wells Fargo Model SM-3.
  - 2.3 Security Alarm Control Panel: The security alarm control panel shall match the base system control panel. Control panel shall have 12 zones and provide an event log. All electronics are contained on a single plug in circuit board utilizing surface mount "SMD" technology. The many programmable features are easily selected or changed from the security terminal remote stations. All programming is stored in a non-volatile EEPROM (Electrically Erasable Programmable Read Only Memory), which maintains its data even when disconnected from power. A "watchdog" circuit monitors the microprocessor and assures the operational integrity of the system. Battery backup shall be provided with control panel.
  - 2.4 Electronic Keypad: The electronic keypad for shall allow programming of the control panel.
- 3.0 EXECUTION:

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- 3.1 All work shall be installed as shown on drawings in accordance with the manufacturer's diagrams and recommendations, except where otherwise indicated. The systems shall be totally integrated with the base alarm system. When any of the detectors senses an intruder, an alarm shall be produced in the main control panel located in the building.
- 3.2 **Balanced Magnetic Switch Mounting:** Unless otherwise indicated, magnetic switch components shall be mounted on the inner side of doors with metal brackets and hardware recommended by the switch manufacturer. Brackets shall be neatly designed and finished to match switch and magnetic housings. Switches shall be carefully connected in accordance with manufacturer's instructions to avoid degrading defeat-resistance. The operating portion of the switch shall be mounted on the doorframe with the associated magnet mounted on the door. Two switches shall protect double leaf doors, one on each door. Should a switch mechanism have to be mounted on a door, the electrical connection shall be jumpered within a flexible armored cord constructed from corrosion-resistant metal. Each end of the armored cord shall terminate in a junction box or other suitable enclosure. Armored cord ends shall be mechanically secured to the junction boxes by clamps or bushings. Conductors within the armored cord shall be provided with lug terminals at each end. The jumpered conductors and the armored cord shall display no mechanical strain as the door is moved from fully open to closed. The switch housing shall be protected from unauthorized access by a cover operated, corrosion-resistant tamper device. This device shall initiate an alarm when the cover is opened as much as 1/4 inch from closed position, and be inaccessible until actuated.
- 3.3 **Wiring:** System components shall be securely fastened to their supports independently of the wiring. Runs of conduit, wire and cable shall be straight, neatly arranged, properly supported, and parallel or perpendicular to walls and partitions. All wiring shall be concealed. Power conductors for the devices shall be number 18 AWG and the detection conductors shall be no smaller than number 22 AWG. All devices shall be wired to provide tamper supervision.
- 3.4 Upon completion of the installation and prior to final inspection, the Contractor shall furnish four copies of "as-built" drawings. Drawings shall show equipment configuration, control panel equipment, location of standby power, supply and all connecting wiring. Drawings shall include all wiring color codes and terminal numbers and termination points for all wires. In addition, the Contractor shall furnish four copies of a manual giving complete instructions for the operation, inspection, testing, and maintenance of the system including wiring diagrams.
- 3.5 **Operating Instructions:** Step-by-step procedures required for startup and operation shall be furnished at least 30 days prior to scheduled start of acceptance tests. The instructions shall include the manufacturer's name, equipment and their basic operating features.
- 3.6 **Maintenance Instructions:** A listing of routine maintenance procedures, possible breakdowns, and repairs shall be furnished at least thirty days prior to scheduled start of acceptance test. The instructions shall include simplified diagrams for the system as installed.
- 3.7 **Testing:** After all equipment for this system has been installed and made operational, and at a time directed by the Contracting Office, the Contractor shall conduct tests to demonstrate that the installation and the system operation is in accordance with the plans and specifications. Prior to the demonstration test for the Contracting Officer, the Contractor shall check the entire system, verify device and system satisfactory operation and correct all discrepancies. Testing of the system shall include remote annunciation of alarms. Satisfactory operation of all devices in the system shall be demonstrated during the test. Upon completion and testing of the installed system, test reports shall be submitted in booklet form showing all field tests performed to adjust each detector system, and all field tests performed to provide compliance with the specified performance criteria. Each test report shall indicate the final position or reading of calibrating controls.

**Fire Detection and Alarm Systems**

- 1.0 **DESCRIPTION OF WORK:** This specification covers the furnishing and installation of labor, equipment and material and installation of fire detection and alarm systems. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 **PRODUCTS:**

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- 2.1 Materials and equipment shall be new standard products of the manufacturer's latest design, and suitable to perform the function intended. Components of two or more models will not be combined to form a single control unit. Where two or more pieces of equipment must perform the same functions, the same manufacturer shall produce this equipment. The name of the manufacturer shall appear on all major components. Fire alarm zones shall be laid out by device type such as: attic heat detectors, pull stations, ceiling mounted heat detectors, flow switches, tampers, and duct detectors. Zones shall not be laid out geographically such as by sections of the facility with all devices in that section mixed in a single zone. There shall only be one central fire alarm panel located in any facility. Heat detectors shall be removed from facilities when a fire sprinkler system is installed.
- 2.2 All materials and equipment shall conform to the requirements of the UL, or the FMS for fire-alarm systems of the type indicated. The Contractor shall submit proof that the items furnished under this specification conform to these requirements. The UL label or seal, or listing in the U Fire Protection Equipment Directory will be accepted as evidence that the items conform to UL requirements. The FMS label or seal, or listing in the Factory Mutual Approval Guide will be accepted as sufficient evidence that the items conform to the FMS requirements.
- 2.3 Contractor shall include a complete set of shop drawings to include all material and equipment proposed for installation. Shop drawings shall show the complete conduit and wiring layout for the equipment, including AWG size and type wire, number of conductors and connections to the equipment items. The drawings shall be point to point from panel to each J-box to each device and show wire color and wire number. Numbers will be installed on wires using crimp-on tags placed 5 to 6 inches from Wires end.
- 3.0 EXECUTION:
- 3.1 Installation and wiring: System components shall be securely fastened to their supports independently of the wiring. The control unit shall be installed in a room directly accessible from the building exterior. Runs of conduit, tubing, wire and cable shall be straight, neatly arranged, properly supported, and parallel or perpendicular to walls and partitions. Installation of wiring shall conform to NFPA 70. All wiring shall be installed in conduit. The sum of the cross-sectional areas of individual conductors shall not exceed 40 percent of the interior cross-sectional area of the conduit. Wiring for fire alarm zones shall be color-coded by zone with two colors remaining consistent throughout the zone. No two zones using the same colors shall transit the same junction box. This does not negate the requirements for numbering wires. Numbers will originate at the control panel and be used throughout the circuit at all junctions and terminal devices. Wiring for audible visual circuits shall be color-coded red for positive and black for negative. All junction boxes and their covers will be painted red. Existing wiring in facilities being renovated shall not be reused.
- 3.2 Audible and visual alarm devices: Audible and Visual devices shall be furnished to indicate an alarm throughout the building. Type devices are specified below. The top of the devices shall be mounted in accordance with NFPA 72 para. 4-3. All devices shall be supervised and operate on low voltage D.C. furnished by the control panel. All audible devices shall meet U 464 requirements.
- 3.3 Signal Devices: Strobe horns shall be used for non-coded signals. Bells will be used where horns conflict with other devices. Chimes with strobe lights will be used in low noise areas such as hospitals and childcare facilities. The same type of device shall be consistent throughout a facility. Devices shall not be mixed.
- 3.4 Visual Alarm Indicator: Visual indicators shall have a high impact plastic translucent lens with "FIRE" printed in red letters on at least two sides and shall be positioned to be readable from any angle. The flashing of multiple visual indicators shall be synchronized. This indicator will normally be integral with the horn except where only a visual indicator is required such as latrines.
- 3.5 Manual fire-alarm stations shall conform to the applicable requirements of UL 38. Manual stations shall be connected into alarm initiating circuits. Stations shall be installed on semi-flush mounted outlet boxes. Stations shall be double action type. Stations shall be located within 5 feet of the exits and on all floors. Stations shall be finished in red, with raised letter operating instructions of contrasting color. Stations requiring the breaking of glass or plastic panels or glass rods for operation are not acceptable. The use of a common screwdriver shall be required to reset the station. Gravity or mercury switches are not acceptable. Switches and contacts shall be rated for

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- the voltage and current upon which they shall operate. Stations shall have a separate screw terminal or lead for each conductor unless a nut plate is provided to accommodate both conductors in a loop. The loop shall not be continuous at the connection. Surface mounted boxes shall be painted the same color as the fire alarm manual stations.
- 3.6 Fire detecting equipment shall conform to NFPA 72 and shall be of the following types, as indicated on the drawings and as approved by the Contracting Officer. Detector circuit design shall be suitable for the types and numbers of detectors, as approved, and shall limit detector circuit current not to exceed ratings of the detectors and associated relays. Per NFPA 72 para. 2-3.6.1.3, detectors shall not be installed until after the construction cleanup of all trades is complete and final. Furthermore, during renovation projects, existing detectors shall be removed and reinstalled or covered during construction.
- 3.7 Photoelectric Type Smoke Detectors: Ceiling smoke detectors, which operate on the light scattering or the light obstruction principle, shall be furnished. Smoke detectors shall not be mounted in the direct path of airflow from ceiling or wall-mounted diffusers.
- 3.8 Duct-Mounted Smoke Detectors: Duct-mounted photoelectric smoke detectors shall be furnished and installed in accordance with NFPA 72 para. 2-10.5 and NFPA 90A. A remote key/reset/test switch shall be furnished for duct detectors that are at a location that is not easily accessible for testing the installed duct detector. The detector housing shall be equipped with a transparent viewing port which shall permit viewing of detector head Alarm/Power-On indicator -at viewing angles up to 80 degrees off normal and inspection of cleanliness conditions inside the detector head mounting chamber. The detector shall be the plug-in type in which the detector base contains terminals for making all wiring connections. The detector indicator shall blink intermittently during standby conditions and shall glow red during alarm conditions. All LED's to indicate the operating and alarm condition and test and reset buttons or test part shall be visible, and accessible, with the unit installed and the cover in place. Detector operating voltage will be supplied from the DC circuits of the fire alarm panel.
- 3.9 Air Handler Units (AHU) with a capacity below 2000CFM shall not have duct smoke detectors installed. The AHU will be shutdown by the fire alarm control panel (FACP). AHU's with a capacity between 2000 - 15,000 CFM shall have one duct detector installed in the supply air duct. AHU's with a capacity greater than 15,000 CFM will have two duct detectors installed, one in the supply air duct and one in the return air duct. Duct smoke detectors will shut down their respective AHU's upon alarm.
- 3.10 Fixed-Temperature Heat Detectors: Only Fixed temperature heat detectors shall be installed unless another type is specifically required to meet code requirements. The UL 521 test rating shall be 135 degrees F. or as shown. Heat detectors installed in attics and mechanical rooms shall be rated at 194 degrees F only. Heat detectors installed in exterior applications such as open storage units shall be all weather detectors, 302AW194.
- 3.11 Control unit (Fire alarm panel) shall be installed as part of the system in each protected building and shall be approved for use with the fire detecting equipment, manual fire-alarm stations, and alarm-sounding devices. The unit shall operate with 24 volts DC derived from its internal AC rectifier/power supply. The control unit circuits shall be exclusively solid state. The control unit shall be housed in a substantial steel cabinet with lock and key. The cabinet shall be painted inside and out. The control unit shall include light emitting diodes (LED's)(Lamps or neon tubes not acceptable) to visually indicate the system condition, e.g., alarm and trouble by zone, system trouble conditions, primary and backup power supply status, etc. A single switch will be provided to test all LED'S. The control unit shall include switches and devices to test all control unit functions. This includes a system test switch, zone disable, system reset, auxiliary disconnect and audible trouble silence switch, etc. The silence switch shall be provided with an audible resound feature. The unit shall supervise all alarm initiating circuits and all alarm sounding circuit. The components shall be modular with plug-in capability. Wires will not require removal to service a module. A separate supervisory module will be provided for tamper and supervisory circuits. All zones will be identified by rigid, engraved plastic ID tags attached to the face of the control unit or the internal face providing they are visible through a transparent window. Paper, etching or embossing tape is not acceptable. It shall also provide regulated and unregulated DC power for smoke detectors,

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which do not operate on zone voltage. With a zone disabled the control unit shall repeat the alarm sequence when a second, third, etc., alarm is initiated in other zones. All LED's shall be plainly visible when the door on the control unit is closed. The control unit shall operate separate audible and visual signals when a ground fault is detected in any supervised circuit or device. It shall sound a distinct audible alarm and flash the visual alarm indicators throughout the building when any manual or automatic device on the system is activated. The fire alarm panel shall be equipped with at least two alarm relays and one trouble relay as integral components of the panel. Add on relays are not acceptable. One alarm relay and the trouble relay dry contacts shall be used solely to activate a radio transceiver. The second alarm relay shall accomplish all auxiliary control, interlock and shutdown functions, as indicated herein and as shown on the drawings. Only low voltage (24) will be brought into the panel for auxiliary functions. The use of plug-on units and special devices not supplied by the manufacturer in conjunction with this feature is unacceptable. The control unit shall meet the requirements of UL 864 and shall be listed for NFPA 72. A remote annunciator will not be required.

- 3.12 Addressable Control Units: Addressable control units shall be fully field programmable from the internal keyboard. This shall include the addition of points, modification of points, and deletions. All system software required to perform uploads/downloads by base maintenance personnel shall be supplied.
- 3.13 Primary Power Supply: Primary power supply for the control unit shall be on a dedicated 15-amp branch circuit protected by surge protection devices. The service disconnect shall be accessible only to authorized personnel, installed adjacent to the control unit and clearly marked FIRE ALARM. At locations where the circuit breaker is out of sight of the fire alarm control panel, a disconnect switch shall be installed adjacent to the control panel. The conductors feeding the control panel shall be #14 AWG. Stake-on terminal lugs are not acceptable for wire terminations. Id tag will be rigid plastic.
- 3.14 Standby Power Supply: Standby power to insure operation of the fire alarm system in the event of primary power failure shall be provided by no more than two each maintenance free storage batteries. Power supply shall be provided with an automatic battery charger capable of a high/low charge rate. Battery shall have the capacity to operate the fire system for 24 hours and then be capable of sounding all alarms for five minutes in the event of total failure of the primary power supply. The charging circuit for the battery shall be supervised to indicate a low battery condition and be rated to recharge fully discharged batteries in 24 hours.
- 3.15 After all equipment for this system has been installed and made operational, the contractor shall conduct tests to demonstrate that the installation and the system operation is in accordance with the plans and specifications. Testing of the system shall include remote annunciation of alarms and trouble conditions to the fire department. The contractor will also certify in writing that the work accomplished meets all contractual requirements.

**DIVISION 31-EARTHWORK & DIVISION 32-EXTERIOR IMPROVEMENTS**

**Standard Penetration Tests**

- 1.0 DESCRIPTION OF WORK: This specification covers core drilling and borings for subsurface investigation of soils.
- 2.0 PRODUCTS: (Section not used.)
- 3.0 EXECUTION:
  - 3.1 Auger Borings: ASTM D 1452.
  - 3.2 Soil Samples: ASTM D 1586, ASTM D 1587.
  - 3.3 Rock Cores: ASTM D 2113, Size BX and NX.
  - 3.4 Bearing Capacity: ASTM D 1194.
  - 3.5 Soils Classification: ASTM D 2487, D 2488.
  - 3.6 Boring Logs: Boring report shall include, but not be limited to, a boring location plan locating and numbering boring and boring logs. Log of borings shall have boring number; date of start and

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finish of boring; rig type, job number and name; sample number, depth, and type; depth of strata changes, soil description and classification, surface elevation, depth of boring, and depth of water table.

**Concrete Core Drilling**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing of equipment and labor for core drilling of existing concrete. Procedures shall be in accordance with the equipment manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: (Section not used)
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Equipment shall be of shot-drill or diamond-drill type and shall be acceptable to the Authorized Member Representative. Shot drilling shall be used on horizontal surfaces only.
    - 3.1.2 Location and Size of Cores shall be as directed by the Authorized Member Representative.
  - 3.2 Core Drilling:
    - 3.2.1 Drilling shall be performed in a neat manner providing a smooth, clean hole perpendicular to the surface.
    - 3.2.2 Equipment shall be rigidly affixed to the surface to prevent drifting or misalignment of the hole.
    - 3.2.3 Work shall be planned and executed so that dust and rubble are held to a minimum.
    - 3.2.4 Surrounding surfaces, material and equipment shall be protected from damage from dust, water and flying debris.
  - 3.3 Test Samples:
    - 3.3.1 Where cores from drilling are to be used for testing of existing concrete, the resulting core shall meet the requirements of ASTM C 42.
    - 3.3.2 Test cores shall be taken at locations as directed by the Authorized Member Representative.

**Clearing and Grubbing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing of labor and equipment for clearing and grubbing.
- 2.0 PRODUCTS: (Section not used.)
- 3.0 EXECUTION:
  - 3.1 Clearing: Trees, stumps, roots, brush, and other vegetation in areas to be cleared shall be cut off flush with or below the original ground surface, except such trees and vegetation as may be indicated or directed to be left standing. Clearing shall also include the removal and disposal of structures that obstruct, encroach upon, or otherwise obstruct the work.
  - 3.2 Grubbing: Material to be grubbed, together with logs and other organic or metallic debris not suitable for foundation purposes, shall be removed to a depth of not less than 18 inches below the original surface level of the ground in areas indicated to be grubbed. Depressions made by grubbing shall be filled with suitable material and compacted to make the surface conform with the original adjacent surface of the ground.
  - 3.3 Tree removal shall include the felling of trees and the removal of stumps and roots.
  - 3.4 Disposal of Materials: All felled timber, logs, stumps, roots, brush, rotten wood, and other refuse from the clearing and grubbing operations shall be in compliance with all federal, state, and local regulations, including environmental regulations.

**Site Grading**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing of labor and equipment for site grading.
- 2.0 PRODUCTS: Borrow material shall be selected to meet requirements and conditions of the particular fill for which it is to be used. Necessary clearing, grubbing, disposal of debris, and satisfactory drainage of borrow pits shall be performed by the Contractor. The source of borrow material shall be the Contractor's responsibility. Satisfactory material shall be approved by the Authorized Member Representative.
- 3.0 EXECUTION:

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- 3.1 Topsoil shall be removed without contamination with subsoil and stockpiled convenient to areas for later application or at locations designated. Topsoil shall be removed to full depth and shall be stored separate from other excavated materials and piled free of roots, stones, and other undesirable materials.
- 3.2 Excavation: After all stripping has been completed, excavation of every description, regardless of material encountered, within the grading limits of the project shall be performed to the lines and grades designated. Satisfactory excavation material shall be transported to and placed in fill areas within the limits of the work. All unsatisfactory material and surplus material shall be disposed of in areas approved for surplus material storage.
- 3.3 Preparation of Ground Surface for Fill: All vegetation, such as roots, brush, heavy sods, heavy growth of grass, and all decayed vegetable matter, rubbish, and other unsatisfactory material within the area upon which fill is to be placed shall be stripped or otherwise removed before the fill is started. Sloped ground surfaces steeper than one vertical to four horizontal on which fill is to be placed shall be plowed, stepped, or broken up as directed, in such manner that the fill material will bond with the existing surface.
- 3.4 Fills and Embankments: The completed fill shall conform to the shape of the typical sections indicated or shall meet the requirements of the particular case. Fill shall be satisfactory material and shall be reasonably free from roots, other organic material, trash, and stones having a maximum diameter greater than 6 inches. No frozen material will be permitted in the fill. Stones having a dimension greater than 4 inches shall not be permitted in the upper 6 inches of fill or embankment.
- 3.5 Finished Excavation, Fills, and Embankments: All areas covered by the project, including excavated and filled sections and adjacent transition areas, shall be uniformly smooth graded. The finished surface shall be reasonably smooth, compacted, and free from irregular surface changes.
- 3.6 Placing Topsoil: On areas to receive topsoil, the compacted sub grade soil shall be scarified to a 2-inch depth for bonding of topsoil with subsoil. Topsoil then shall be spread evenly and graded to the elevations and slopes shown. Topsoil shall not be spread when frozen or excessively wet or dry.

**Rock Removal**

- 1.0 DESCRIPTION OF WORK: This specification covers removal of rock. Operating procedures shall be in accordance with the equipment manufacturer's recommendations. Demolition and removal of material shall be as required to support the work.
- 2.0 PRODUCTS: (Section not used.)
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Review the site for existing features, such as buildings or utilities that will require protection or other coordination of the work.
    - 3.1.2 Clear the area and excavate as required to provide access to the rock to be removed.
    - 3.1.3 Provide bracing, shoring, etc., as required to safely execute the work.
    - 3.1.4 Provide dewatering as required.
  - 3.2 Installation:
    - 3.2.1 Remove rock to the lines required or designated. Blasting must be approved by the Authorized Member Representative.
    - 3.2.2 Haul Excavated Materials to the designated area.

**Finish Grading for Structures and Slabs**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing of labor and equipment for finish grading for structures and slabs.
- 2.0 PRODUCTS: Borrow material shall be selected to meet requirements and conditions of the particular fill for which it is to be used. Necessary clearing, grubbing, disposal of debris, and satisfactory drainage of borrow pits shall be performed by the Contractor. The source of approved borrow material shall be the Contractor's responsibility. Satisfactory materials shall consist of cohesionless materials classified by ASTM D 2487 as CL, GW, GP, GM, GC, SP, SC, SM, and SW. Materials classified as GM and SM will be identified as cohesionless only when the fines are

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nonplastic.

3.0 EXECUTION:

- 3.1 Topsoil shall be removed without contamination with subsoil and stockpiled convenient to areas for later application or at locations specified.
- 3.2 Excavation shall be performed to the required lines and grades. Satisfactory excavation material shall be transported to and placed in fill areas within the limits of the work. All unsatisfactory material and surplus material shall be disposed of in areas approved for surplus material storage.
- 3.3 Fills and Embankments: The completed fill shall meet the requirements of the particular case. Fill shall be satisfactory material. No frozen material will be permitted in the fill. Stones having a dimension greater than 4 inches shall not be permitted in the upper 6 inches of fill or embankment.
- 3.4 Compaction Requirements: Satisfactory material shall be placed in horizontal layers not exceeding 8 inches in loose depth and compacted to 95 percent maximum density in conformity with ASTM D 1556.

**Site Excavation and Fill**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of material for site excavation and fill.
- 2.0 PRODUCTS: Satisfactory materials shall consist of cohesionless materials classified by ASTM D 2487 as CL, GC, GW, GP, GM, SP, SC, SM, and SW. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic.
- 3.0 EXECUTION:
- 3.1 Excavation: The Contractor shall perform excavation of every type of material encountered within the limits of the project, to the required lines, grades, and elevations. Satisfactory excavated materials shall be placed in fill or embankment within the limits of the work. Unsatisfactory materials encountered within the limits of the work shall be excavated below grade and replaced with satisfactory materials. Additionally required material for fill or embankments shall be excavated from approved borrow areas.
- 3.2 Ditches, Gutters, and Channel Changes: Excavation of ditches, gutters, and channel changes shall be to the required cross sections, grades, and elevations. Backfill shall be thoroughly compacted satisfactory material.
- 3.3 Selection of Borrow Material: Borrow material shall be selected to meet the requirements and conditions of the particular fill or embankment for which it is to be used. Borrow material shall be obtained from approved sources.
- 3.4 Backfill: Backfill adjacent to any and all types of structures shall be placed and compacted in such a manner as to prevent wedging action or eccentric loading upon or against any structure.
- 3.5 Embankment: Earth embankments shall be constructed from satisfactory materials free of organic or frozen material in the embankment and rocks with any dimension greater than 4 inches in the upper 8-inch layer. The material shall be placed in successive horizontal layers of loose material not more than 8 inches in depth.
- 3.6 Compaction Requirements: Satisfactory material shall be compacted to 90 percent maximum density in conformity with ASTM D 1556.

**Excavation, Trenching and Backfilling for Utilities Systems**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for excavation, trenching, and backfilling for utilities systems.
- 2.0 PRODUCTS:
- 2.1 Satisfactory Materials: Satisfactory materials shall consist of any cohesionless materials classified by ASTM D 2487 as CL, GC, GM, GW, GP, SC, SP, SM, and SW. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic.
- 2.2 Select Granular Material: Select granular material shall consist of well-graded sand gravel, crushed gravel, or crushed slag composed of hard, tough, and durable particles.
- 3.0 EXECUTION:
- 3.1 Excavation: During excavation, material satisfactory for backfilling shall be stockpiled at a sufficient distance from the banks of the trench to prevent slides or cave-ins. Excavated material not required

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- or not satisfactory for backfill shall be removed from the site. Trenches shall be dewatered as required.
- 3.1.1 Trench Excavation: Trench walls below and above the top of the pipe shall be sloped or made vertical, depending on the type of pipe used and the soil conditions. Trench width below the top of the pipe shall not exceed 24 inches plus pipe outside diameter (OD) for pipes of less than 24-inch inside diameter and shall not exceed 36 inches plus pipe OD for larger sizes. The bottoms of trenches shall be accurately graded to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Bell holes shall be excavated to the necessary size at each joint or coupling to eliminate point bearing. Stones of 3 inches or greater shall be removed to avoid point bearing. Vertical trench walls more than 5 feet high shall be shored. Trench walls that are cut back shall be excavated to at least the angle of repose of the soil.
  - 3.1.2 Removal of Unyielding Material: Where unyielding material is encountered in the bottom of the trench, such material shall be removed 4 inches below the required grade and replaced with select materials and compacted.
  - 3.1.3 Removal of Unstable Material: Where unstable material is encountered in the bottom of the trench, such material shall be removed to the depth directed and replaced to the proper grade with select granular material placed in layers not to exceed a loose thickness at 6 inches and compacted.
  - 3.1.4 Excavation for Appurtenances: Excavation for manholes, catch basins, inlets, or similar structures shall be of sufficient size to permit the placement and removal of forms for the full length and width of structure footings and foundations.
  - 3.2 Backfilling: Backfill material shall be placed in layers of 8 inches loose thickness unless otherwise specified. Each layer shall be compacted to at least 95 percent maximum density for cohesionless soils and 90 percent maximum density for cohesive soils under roadways, airfields, etc. Water flooding or jetting will not be permitted.
    - 3.2.1 Sidewalks, Turfed or Seeded Areas, and Miscellaneous Areas: Backfill shall be deposited in layers of a maximum of 12 inch loose thickness and compacted to 85 percent maximum density for cohesive soils and 90 percent maximum density for cohesionless soils. Water flooding or jetting methods of compaction will be permitted for granular noncohesive backfill material. Water jetting will not be allowed to penetrate the initial backfill.
    - 3.2.2 Trench Backfill: Trenches shall be backfilled to the grade required. The trench shall be backfilled to 2 feet above the top of pipe prior to performing the required pressure tests. The joints and couplings shall be left uncovered during any required pressure tests unless approved by the Authorized Member Representative.
    - 3.2.3 Displacement of Sewers: After other required tests have been performed and the trench backfill compacted to 2 feet above the top of the pipe, the pipe shall be inspected to determine whether significant displacement has occurred. If the interior of the pipe shows poor alignment or any other defects that would cause improper functioning of the system, the defects shall be remedied as directed.
  - 3.3 Special Requirements: Special requirements for both excavation and backfill relating to the specific utilities are as follows:
    - 3.3.1 Gas Distribution: Trenches shall be excavated to a depth that will provide not less than 18 inches of cover in rock excavation and not less than 24 inches of cover in other excavation.
    - 3.3.2 Water Lines: Trenches shall be excavated to a depth that will provide a minimum cover required for frost protection, or from the indicated finished grade, whichever is lower, to the top of the pipe. For fire protection yard mains or piping, the depth of cover shall comply with NFPA No. 24.
    - 3.3.3 Heat Distribution System: Trenches shall be excavated to a depth that will provide a minimum cover required for frost protection. Initial backfill material shall be free of stones larger than 1/4 inch in any dimension.
    - 3.3.4 Electrical Distribution System: Direct burial cable and conduit or duct line shall have a minimum cover of 24 inches from the finished grade, unless otherwise required.

**Structural Excavation and Backfill**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing of labor and equipment for structural excavation.

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- 2.0 PRODUCTS: (Section not used.)
- 2.1 Satisfactory Materials: Satisfactory materials shall consist of any cohesionless materials classified by ASTM D 2487 as CL, GC, GM, GW, GP, SC, SP, SM, and SW. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic.
- 2.2 Select Granular Material: Select granular material shall consist of well-graded sand, gravel, crushed gravel, or crushed slag composed of hard, tough, and durable particles.
- 3.0 EXECUTION:
- 3.1 General: The excavation shall include trenching for utility and foundation drainage systems to a point 5 feet beyond the building line of each building and structure. Unsatisfactory material shall be removed, and satisfactory material shall be placed and compacted.
- 3.2 Drainage: Excavation shall be performed so that the area of the site and the area immediately surrounding the site and affecting operations at the site will be continually and effectively drained.
- 3.3 Utility and Drain Trenches: Trenches for underground utilities systems and drain lines within 5 feet of the building or structure shall be excavated to the required alignments and depths. The bottoms of trenches shall be graded to secure the required slope and shall be tamped if necessary to provide a firm pipe bed.
- 3.4 Borrow: Where satisfactory materials are not available in sufficient quantity from required excavations, approved materials shall be obtained from approved sources.
- 3.5 Excavated Materials: Satisfactory excavated material required for fill or backfill shall be placed in the proper section of the permanent work required under this section or shall be separately stockpiled if it cannot be readily placed.
- 3.6 Final Grade of Surfaces of Support Concrete: Excavation to final grade shall not be made until just before concrete is to be placed. For pile foundations, the excavation shall be stopped at an elevation 6 to 12 inches above the bottom of the footing before driving piles. Rock shall be worked down to a satisfactory bed or sidewall.
- 3.7 Filling and Sub grade Preparation: Satisfactory materials free from roots, debris, or stones larger than 3 inches shall be used in bringing fills to the lines and grades indicated and for replacing unsatisfactory materials.
- 3.8 Backfilling: Backfilling shall not begin until construction below finish grade has been approved; underground utilities systems have been inspected, tested, and approved; forms have been removed; and the excavation has been cleaned of trash and debris. Backfill shall be brought to indicated finish grade and shall include backfill for outside grease interceptors and underground fuel tanks. Backfill shall not be placed in wet or frozen areas. Backfill shall not be placed against foundation walls prior to 7 days after completion of the walls. As far as practicable, backfill shall be brought up evenly on each side of the wall and sloped to drain away from the wall.

**Pipe Sleeves for Utility Lines**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of pipe sleeves for utility lines. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Jack-Boring Operation: AREA-01.
- 2.2 Sleeve Materials:
  - 2.2.1 Concrete Pipe: ASTM C 76.
  - 2.2.2 Steel Pipe: ASTM A 53.
  - 2.2.3 Corrugated Steel Pipe: ASTM A 760.
  - 2.2.4 Ductile Iron Pipe: ASTM A 716.
- 3.0 EXECUTION:
- 3.1 Roads and Airfields: At primary access road crossings and at airfield runways and taxiways where aircraft move under their own power, utility lines shall be encased in sleeves of rigid conduit for the length installed under such facilities. Sleeves shall extend a minimum of 5 feet beyond the toe of the slope on each side of the embankment.

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- 3.2 Structures: Where utility lines are required to be installed within 3 feet of existing buildings or structural foundations, the lines shall be encased in sleeves of rigid conduit.
- 3.3 Clearance: A minimum clearance of at least 2 inches between the inner diameter of the sleeve and the maximum outside diameter of the sleeved pipe, including the joints, shall be provided.
- 3.4 Sand Bedding: Sand bedding shall be provided for the carrier pipe through the sleeve.

**Field Tests**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing of labor and equipment for soils compaction testing.
- 2.0 PRODUCTS:
- 2.1 Cohesionless and Cohesive Materials: Cohesionless materials include materials classified in ASTM D 2487 as CL, GM, GC, GW, GP, SC, SM, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. 2.2 Degree of Compaction: Degree of compaction required as expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557, Method D, abbreviated below as maximum density.
- 3.0 EXECUTION:
- 3.1 Compaction Requirements: Each layer shall be compacted to not less than the percentage of maximum density specified below:  
Percent CE 55 Maximum Density

	Cohesive Material	Cohesionless Material
Fill, Embankment, and Backfill		
Under proposed structures, building slabs, steps, and paved areas	90	95
Under sidewalks and grassed areas	85	90
Sub grade		
Under building slabs, steps, and paved areas, top 12 inches	90	95
Under sidewalks, top 6 inches	85	90

- 3.2 Test Procedure: Field in-place density shall be determined in accordance with ASTM D 1556.

**Soil Stabilization: Crushed Rock Sub Grade**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing of materials and the preparation and production of a stabilized sub grade by adding granular material and/or fines to the native sub grade material.
- 2.0 PRODUCT: The crushed rock sub grade shall be a composite mixture of coarse aggregate and fine aggregate. Coarse aggregate shall consist of hard, durable particles or fragments of stone, gravel, or slag, or a combination of these. Materials that break up when alternately frozen and thawed, or when alternately wetted and dried are not suitable for stabilized material. Fine aggregate shall consist of natural or crushed sand. The composite mixture of coarse and fine aggregates should be free from vegetable matter and lumps or balls of clay. Aggregate used shall meet the following gradation limits or shall meet the gradation requirements of the applicable State Highway Department wherein the work is performed as approved by the Authorized Member Representative:  
Coarse Aggregate  
Retained on 1-1/2 inch sieve            0 percent  
Retained on 3/4-inch sieve            0 - 15 percent  
Retained on No. 4 sieve, minimum    10 percent  
Retained on No. 8 sieve                25 - 70 percent  
Fine Aggregate  
Retained on No. 40 sieve               50 - 90 percent  
Retained on No. 200 sieve             85 - 95 percent
- 3.0 EXECUTION: Scarify the sub grade to the depth required. Add granular material to the native material that will bring the composite mixture into compliance with sub grade material

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requirements. Add water and compact sub grade to required density.

**Soil Stabilization: Hydrated Lime**

- 1.0 DESCRIPTION OF WORK: This specification covers furnishing of materials and the preparation and production of a stabilized sub grade by the addition of hydrated lime to the native material.
- 2.0 PRODUCTS: Hydrated lime material requirements shall be as follows:
  - 2.1 Available Lime Index as Calcium Hydroxide: 90 percent minimum.
  - 2.2 Residue Retained on No. 30 Sieve: 1 percent maximum.
  - 2.3 Residue Retained on No. 200 Sieve: 20 percent maximum.
- 3.0 EXECUTION:
  - 3.1 Preparation: Scarify the sub grade to the depth required and pulverize the material until it is substantially free of lumps greater than 3 inches in diameter.
  - 3.2 Installation: Lime shall be applied to the pulverized material as a slurry unless otherwise directed. Water shall be added as needed to provide a moisture content of not less than 20 percent. Surface-applied lime slurry shall be plowed and/or disced into the soil as necessary. The resulting mixture shall be aged for not less than 48 hours before compaction.

**Soil Stabilization: Vibroflotation**

- 1.0 DESCRIPTION OF WORK: This specification covers the densification of sandy subsurfaces by the method of vibroflotation.
- 2.0 PRODUCTS: (Section not used.)
- 3.0 EXECUTION: The vibroflotation process shall be applied only to areas of clean, granular soils, with not over 20 percent silt or 10 percent clay. Vibrators shall be water-jetted into the soil mass to the depth required. The vibrator shall be withdrawn in 1 foot increments as the saturated soil compacts laterally and at a rate of approximately 1 ft/min to a minimum relative density of 70 percent. As the surface crater forms, sand or crushed rock shall be added and compacted to the appropriate line and grade. The horizontal distance between successive treatments shall not exceed 5 feet, or as directed.

**Soil Sterilization**

- 1.0 DESCRIPTION OF WORK: This specification covers soil sterilization. Products shall be as directed. Installation procedures shall be in accordance with the product manufacturer's recommendations.
- 2.0 PRODUCTS:
  - 2.1 Weed Eradication and Soil Fumigation: Products approved by the Environmental Protection Agency.
  - 2.2 Liquid and Dry Herbicides:
    - 2.2.1 Bare Ground Herbicides: Bromacil powder mixture or an ammonium sulfamate spray.
    - 2.2.2 Wetting Agents: As required.
- 2.3 Equipment: Equipment shall be appropriate to the application and approved before use by the Authorized Member Representative.
- 3.0 EXECUTION:
  - 3.1 Soil: After the sub grade has been prepared, all areas to be surfaced shall be treated with a weed eradicator and soil fumigant only in the designated areas.
  - 3.2 Wetting Agents: Wetting Agents may be used as an additive to improve the performance of weed and brush herbicides.

**Sediment Control**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing of materials and the installation of sediment control by means of a silt fence to control the drifting of silt, sand, dust, or earth.
- 2.0 PRODUCTS:
  - 2.1 Silt Fence shall be composed of 100 percent spunbonded nylon with polyester netting and shall have the following minimum properties:
    - Weight 4.2 oz/yd ASTM D 3776 2
    - Thickness 10 mils ASTM D 1777
    - Grab Tensile 130 lbs. ASTM D 1682

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Elongation to Break 25% +/- 3% ASTM D 1682

Mullen Burst 210 lbs.

Water Flow Rate 470 gpm/ft<sup>2</sup>

Equip. Opn. Size 70 - 100

Cord 1/8 in. Nylon Braid

Strength Retention Ultraviolet Protection Fabric Width Supplied in Widths to Meet Local, State, D.O.T., and/or Federal Requirements

- 2.2 Fence Posts shall be steel T-posts or cured oak posts, spaced approximately 8 feet apart. Selection of the type of post used, as well as the distance between posts, shall be determined by the manufacturer of the fabric and approved by the Authorized Member Representative.
- 3.0 EXECUTION:
- 3.1 Installation: Installation procedures shall be as recommended by the manufacturer.
- 3.2 Reuse: Silt fence shall be of such quality that it may be removed and reused at other sites.

**Gabions**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of gabions. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Wire Cages shall be made of hexagonal twist mesh (3 1/2 inches x 4 1/2 inches) with heavily galvanized steel wire. Wire for wire cages shall be a minimum of 0.118 inch in diameter and shall be in conformance with ASTM A 510 and A 641.
- 2.2 Lacing Wire shall meet the same specifications as the wire used in the mesh, except that its diameter shall be a minimum of 0.0866 inch.
- 2.3 Fill Material shall consist of hard, durable, clean stone, 4 to 8 inches in size, or as approved.
- 3.0 EXECUTION:
- 3.1 Preparation: Before gabions are placed, the earth on which the gabions are to be placed shall be graded to be relatively smooth.
- 3.2 Installation:
- 3.2.1 Baskets shall be delivered in a collapsed form. Erect and lace together with lacing wire.
- 3.2.2 Install Fill Rock in mesh baskets with appropriate equipment. Manually adjust stone during the filling operation to prevent undue voids.
- 3.2.3 Hand Place Exposed Faces using selected stone to prevent gabions from bulging. Level the last lift of stone with the top of the gabion to properly close the lid to provide an even surface for the next course.

**Riprap**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of riprap. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Riprap: Stone used for dumped riprap shall be hard, durable, angular in shape, resistant to weathering and to water action, and free from overburden, spoil, shale, and organic material. Neither width nor thickness of a single stone should be less than one third its length. Rounded stone, boulders, shale, and stone with shale seams will not be acceptable. The minimum density of the riprap material shall be 162 pounds per cubic foot. Each load of riprap shall be reasonably well graded. Sand and rock dust exceeding 5 percent by weight of each load shall not be permitted.
- 2.2 Riprap Bedding: The riprap bedding blanket shall consist of well-graded gravel, crushed rock, sand, or a combination thereof with a maximum size of 6 inches. All material comprising the riprap bedding blanket shall be composed of tough, durable particles, reasonably free from thin, flat, and elongated pieces, and shall contain no organic matter nor soft, friable particles in excess quantities.
- 3.0 EXECUTION:
- 3.1 Preparation: Prepare earth slopes by grading and compacting.

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3.2 Installation:

- 3.2.1 Riprap Bedding Blanket Layers shall be placed on the prepared slope or area to develop the full thickness. Each layer shall be placed in one operation, using methods that will not cause segregation of particle sizes within the bedding. The surface of the finished layer should be reasonably even and free from mounds or windrows.
- 3.2.2 Stone for riprap shall be placed on the prepared slope or area in a manner that will produce a reasonably well-graded mass of stone with the minimum practicable percentage of voids. Riprap shall be placed to its full course in one operation and in such a manner as to avoid displacing the underlying material. The larger stones shall be well distributed and the entire mass of stone shall be well-graded. The result shall be a compact, uniform riprap layer.

**Soil: Cement Surfacing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of soil-cement surfacing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Soil: Use SP and SM soils as classified in ASTM D 2487. The soil aggregate shall contain not more than 55 percent material by dry weight passing the No. 4 sieve and not more than 25 percent material passing the No. 200 sieve. Clay lumps shall be removed.
  - 2.2 Cement: ASTM C 150, Type I.
  - 2.3 Curing Compound: ASTM C 309.
- 3.0 EXECUTION:
  - 3.1 Place the plant-mixed soil-cement in uniform lifts and compact to the agreed-upon density as determined by ASTM D 558. The optimum moisture content shall be maintained.
  - 3.2 Finish soil-cement surface to the required lines, grades, and cross sections after compaction.
  - 3.3 Construction Joints: If required, construction joints may be horizontal or vertical.
  - 3.4 Curing: Temporary curing of surfaces to receive subsequent bonded lifts or coatings shall be by water fogging. Final curing shall be by application of a membrane maintained intact for 7 days.

**Portland Cement Concrete Overlays**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of Portland cement concrete overlays on previously paved areas. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Coarse Aggregate:
    - 2.1.1 Composition: Coarse aggregate shall consist of gravel, crushed gravel, crushed stone, a combination thereof, or crushed blast-furnace slag.
    - 2.1.2 Particle Shape: Particles of the coarse aggregate shall be generally spherical or cubical in shape. The quantity of flat and elongated particles in any size group shall not exceed 20 percent by weight as determined by ASTM D 3398.
    - 2.1.3 Gradation: The maximum size of coarse aggregate shall be the lesser of 1/4 of the pavement thickness or 2 inches nominal size. Gradation limits are specified in ASTM C 136.
    - 2.1.4 Deleterious Substances: The amount of deleterious substances in the coarse aggregate shall not exceed the limits, defined in ASTM C 117 and C 123.
  - 2.2 Fine Aggregate shall consist of natural sand, manufactured sand, or a combination of natural and manufactured sand and shall be composed of clean, hard, durable particles. Particles of the fine aggregate shall be generally spherical or cubical in shape. Gradation limits are specified in ASTM C 136.
  - 2.3 Portland cement shall be Type I in compliance with ASTM C 150.
  - 2.4 Air-Entraining Admixture shall be in compliance with ASTM C 260. Concrete mixtures shall have air

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- content by volume of concrete of 4 to 7 percent based on measurements made immediately after discharge from the mixer.
- 2.5 Concrete mixture shall have a nominal slump of 2 inches with a maximum of 3 inches and a 28-day flexural strength of not less than 650 psi.
  - 2.6 Joint and Crack Sealing Materials: Joint filler, joint sealant, and crack sealant shall comply with the following:
    - 2.6.1 Expansion joint fillers shall comply with ASTM D 1751 or D 1752 or shall be resin impregnated fiberboard in compliance with the physical requirements of ASTM D 1752.
    - 2.6.2 Type I sealant shall comply with applicable standards and/or specifications, except that sealant may be furnished as a ready-mixed liquid.
    - 2.6.3 Type II sealant shall comply with applicable standards and/or specifications.
    - 2.6.4 Type V sealant shall comply with CE CRD-C-527 and may be either a single or multiple component material.
  - 2.7 Epoxy-Resin Materials: Materials used in Epoxy-resin grout, mortar, and concrete shall comply with the following:
    - 2.7.1 Epoxy-resin grout shall be a two-compound material formulated to comply with Applicable standards and/or.
    - 2.7.2 Epoxy-resin concrete shall be composed of epoxy-resin binder and uniformly graded aggregate in compliance with ASTM C 144. The maximum size of aggregate shall be 3/8 or 1/2 inch.
  - 2.8 Dowels shall be plain steel bars complying with ASTM A 499.
  - 3.0 EXECUTION:
    - 3.1 Preparation of Existing Surface: The Contractor shall raise and reset all structures such as manhole frames, valve boxes, drainage structures, etc. to meet the required grade. Bonding course shall be applied to the area prepared to receive overlay and shall be of Epoxy-resin grout and Portland cement mortar.
    - 3.2 Concrete Placement: Concrete shall be placed within 45 minutes from the time all ingredients are charged into the mixing drum.
      - 3.2.1 Weather Limitations: The temperature of the concrete placed during warm weather shall not exceed 85 degrees F. Special protection measures, approved by the Authorized Member Representative, shall be used if freezing temperatures are anticipated before the expiration of the specified curing period. Calcium chloride shall not be used.
    - 3.3 Vibration: In the final phases of placing, surface vibrating equipment shall be used, and the duration of vibration shall not exceed 20 seconds.
    - 3.4 Joints shall be saw cut and in alignment with underlying existing joints.
    - 3.5 Finishing:
      - 3.5.1 Transverse Finishing: Immediately after placement, concrete shall be accurately struck off and screeded to such elevation that when consolidated and finished, the surface of the pavement will be free from porous places and will be at the required grade. The finishing machine shall make at least two trips over each area of pavement to compact the concrete and produce a surface of uniform texture, true to grade.
      - 3.5.2 Longitudinal Floating: After completion of the transverse finishing, the longitudinal mechanical float shall be operated to smooth and finish the pavement to grade.
      - 3.5.3 Hand finishing shall be with an approved strike and tamping template and a longitudinal float.
      - 3.5.4 Straightedge Finishing: After the longitudinal floating is completed but while the concrete is still plastic, minor irregularities and score marks in the pavement surface shall be eliminated by means of long-handled wood floats and straightedges. The final finish shall be made with the straightedges, which shall be used to float the entire pavement surface.
      - 3.5.5 Burlap Drag Finishing: When most of the water glaze or sheen has disappeared and before the concrete becomes nonplastic, drag the surface of the pavement in the direction of the concrete placement with a multiple ply burlap drag.
      - 3.5.6 Edging: After other finishing has been completed, the edges of slabs along the forms and at the joints shall be carefully finished with an edging tool to form a smooth rounded surface of the required radius.
    - 3.6 Concrete Curing and Protection:

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- 3.6.1 Concrete curing methods shall consist of mat method, impervious sheeting method, or liquid membrane curing method.
- 3.6.2 Concrete Protection: Protect repaired areas against damage prior to final acceptance. Traffic shall be excluded from repaired areas.

**Steel Reinforced Portland Cement Concrete Overlays**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of steel reinforced Portland cement concrete overlays on previously paved areas. Products shall match existing materials and/or shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1.1 Composition: Coarse aggregate shall consist of gravel, crushed gravel, crushed stone, a combination thereof, or crushed blast-furnace slag.
  - 2.1.2 Particle Shape: Particles of the coarse aggregate shall be generally spherical or cubical in shape. The quantity of flat and elongated particles in any size group shall not exceed 20 percent by weight as determined by ASTM D 3398.
  - 2.1.3 Gradation: The maximum size of coarse aggregate shall be the lesser of one-fourth of the pavement thickness or a nominal size of 2 inches. Gradation limits are specified in ASTM C 136.
  - 2.1.4 Deleterious Substances: The amount of deleterious substances in the coarse aggregate shall not exceed the limits defined in ASTM C 117 and C 123.
- 2.2 Fine aggregate shall consist of natural sand, manufactured sand, or a combination of natural and manufactured sand and shall be composed of clean, hard, durable particles. Particles of the fine aggregate shall be generally spherical or cubical in shape. Gradation limits are specified in ASTM C 136.
- 2.3 Portland cement shall be Type I in compliance with ASTM C 150.
- 2.4 Air-entraining admixtures shall be in compliance with ASTM C 260. Concrete mixtures shall have air content by volume of concrete of 4 to 7 percent based on measurements made immediately after discharge from the mixer.
- 2.5 Concrete mixture shall have a nominal slump of 2 inches with a maximum of 3 inches and a 28-day flexural strength of not less than 650 psi.
- 2.6 Joint and Crack Sealing Materials: Joint filler, joint sealant, and crack sealant shall comply with the following:
  - 2.6.1 Expansion joint fillers shall comply with ASTM D 1751 or D 1752 or shall be resin impregnated fiberboard in compliance with the physical requirements of ASTM D 1752.
  - 2.6.2 Type I sealant shall comply with Applicable standards and/or specifications, except that sealant may be furnished as a ready-mixed liquid.
  - 2.6.3 Type II sealant shall comply with Applicable standards and/or specifications.
  - 2.6.4 Type V sealant shall comply with CE CRD-C-527 and may be either a single or multiple component material.
- 2.7 Epoxy-Resin Materials: Materials used in Epoxy-resin grout, mortar, and concrete shall comply with the following:
  - 2.7.1 Epoxy-resin grout shall be a two-compound material formulated to comply with Applicable standards and/or.
  - 2.7.2 Epoxy-resin concrete shall be composed of epoxy-resin binder and uniformly graded aggregate in compliance with ASTM C 144. The maximum size of aggregate shall be 3/8 inch or 1/2 inch.
- 2.8 Steel Reinforcement: All reinforcement shall be free from loose flaky rust, loose scale, oil, grease, mud, or other coatings that might reduce bond. Bar mats shall comply with ASTM A 184. Welded steel wire fabric shall comply with ASTM A 185. Tie bars shall be deformed bars in compliance with ASTM A 615, A 616, or A 617. Dowels shall be plain steel bars complying with ASTM A 499.
- 3.0 EXECUTION:
  - 3.1 Preparation of Existing Surface: The Contractor shall raise and reset all structures such as manhole frames, valve boxes, drainage structures, etc., to meet the required grade. Bonding course shall be applied to the area prepared to receive overlay and shall be of Epoxy-resin grout and Portland cement mortar.

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- 3.2 Reinforcement steel shall be installed by the strike-off method wherein the concrete is deposited on the sub grade and struck to the indicated elevation of the steel. The reinforcement shall be laid upon the prestruck surface.
- 3.3 Concrete Placement: Concrete shall be placed within 45 minutes from the time all ingredients are charged into the mixing drum.
  - 3.3.1 Weather Limitations: The temperature of the concrete placed during warm weather shall not exceed 85 degrees F. Special protection measures, approved by the Authorized Member Representative, shall be used if freezing temperatures are anticipated before the expiration of the specified curing period. Calcium chloride shall not be used.
- 3.4 Vibration: In the final phases of placing, surface vibrating equipment shall be used, and the duration of vibration shall not exceed 20 seconds.
- 3.5 Joints shall be saw cut and in alignment with underlying existing joints.
- 3.6 Finishing:
  - 3.6.1 Transverse Finishing: Immediately after placement, the concrete shall be accurately struck off and screeded to such elevation that when consolidated and finished, the surface of the pavement will be free from porous places and will be at the required grade. The finishing machine shall make at least two trips over each area of pavement to compact the concrete and produce a surface of uniform texture, true to grade.
  - 3.6.2 Longitudinal Floating: After completion of the transverse finishing, the longitudinal mechanical float shall be operated to smooth and finish the pavement to grade.
  - 3.6.3 Hand finishing shall be done with an approved strike and tamping template and a longitudinal float.
  - 3.6.4 Straightedge Finishing: After the longitudinal floating is completed but while the concrete is still plastic, minor irregularities and score marks in the pavement surface shall be eliminated by means of longhandled wood floats and straightedges. The final finish shall be made with the straightedges, which shall be used to float the entire pavement surface.
  - 3.6.5 Burlap Drag Finishing: When most of the water glaze or sheen has disappeared and before the concrete becomes nonplastic, the surface of the pavement shall be dragged in the direction of the concrete placement with a multiple ply burlap drag.
  - 3.6.6 Edging: After other finishing has been completed, the edges of slabs along the forms and at the joints, where indicated or directed, shall be carefully finished with an edging tool to form a smooth rounded surface of the required radius.
- 3.7 Concrete Curing and Protection:
  - 3.7.1 Concrete curing methods shall consist of mat method, impervious sheeting method, or liquid membrane curing method.
  - 3.7.2 Concrete Protection: Repaired areas shall be protected against damage prior to final acceptance. Traffic shall be excluded from repaired areas.

**Fibrous Reinforced Portland Cement Concrete Overlays**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of fibrous reinforced Portland cement concrete overlays on previously paved areas. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Coarse Aggregate:
    - 2.1.1 Composition: Coarse aggregate shall consist of gravel, crushed gravel, crushed stone, a combination thereof, or crushed blast-furnace slag.
    - 2.1.2 Particle Shape: Particles of the coarse aggregate shall be generally spherical or cubical in shape. The quantity of flat and elongated particles in any size group shall not exceed 20 percent by weight as determined by ASTM D 3398.
    - 2.1.3 Gradation: The maximum size of coarse aggregate shall be the lesser of one-fourth of the pavement thickness or 2-inch nominal size. Gradation limits are specified in ASTM C 136.
    - 2.1.4 Deleterious Substances: The amount of deleterious substances in the coarse aggregate shall not exceed the limits defined in ASTM C 117 and C 123.

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- 2.2 Fine Aggregate shall consist of natural sand, manufactured sand, or a combination of natural and manufactured sand and shall be composed of clean, hard, durable particles. Particles of the fine aggregate shall be generally spherical or cubical in shape. Gradation limits are specified in ASTM C 136.
- 2.3 Portland cement shall be Type I in compliance with ASTM C 150.
- 2.4 Air-Entraining Admixture shall be in compliance with ASTM C 260. Concrete mixtures shall have air content by volume of concrete of 4 to 7 percent based on measurements made immediately after discharge from the mixer.
- 2.5 Concrete mixture shall have a nominal slump of 2 inches with a maximum of 3 inches and a 28-day flexural strength of not less than 650 psi.
- 2.6 Joint and Crack Sealing Materials: Joint filler, joint sealant, and crack sealant shall comply with the following:
  - 2.6.1 Expansion joint fillers shall comply with ASTM D 1751 or D 1752 and shall be resin impregnated fiberboard in compliance with the physical requirements of ASTM D 1752.
  - 2.6.2 Type I sealant shall comply with Applicable standards and/or specifications, except that sealant may be furnished as a ready-mixed liquid.
  - 2.6.3 Type II sealant shall comply with Applicable standards and/or specifications.
  - 2.6.4 Type V sealant shall comply with CE CRD-C-527 and may be either a single or multiple component material.
- 2.7 Epoxy-Resin Materials: Materials used in Epoxy-resin grout, mortar, and concrete shall comply with the following:
  - 2.7.1 Epoxy-resin grout shall be a two-compound material formulated to comply with Applicable standards and/or.
  - 2.7.2 Epoxy-resin concrete shall be composed of epoxy-resin binder and uniformly graded aggregate in compliance with ASTM C 144. The maximum size of aggregate shall be 3/8 inch or 1/2 inch.
- 2.8 Steel Fibers: The fibers shall be made from low carbon steel. The following sizes of steel are acceptable: 0.010-inch x 0.022-inch flat steel fiber, 0.010-inch x 0.50-inch round steel fiber, 0.016-inch x 1.0-inch round steel fiber, and 0.016-inch x 0.75-inch round steel fiber with 0.010-inch x 0.020-inch flat section along the length of the fiber and 2.5-inch x 0.025-inch round steel fibers.
- 3.0 EXECUTION:
- 3.1 Preparation of Existing Surface: The Contractor shall raise and reset all structures such as manhole frames, valve boxes, drainage structures, etc., to meet the required grade. Bonding course shall be applied to the area prepared to receive overlay and shall be of Epoxy-resin grout and Portland cement mortar.
- 3.2 Batching: Fibers and aggregate shall be blended prior to charging the mixer. The introduction of cement, water, and additives shall be matched with the rate of flow of the fiber-aggregate mixture to assure uniform mix.
- 3.3 Concrete Placement: Concrete shall be placed within 45 minutes from the time all ingredients are charged into the mixing drum.
  - 3.3.1 Weather Limitations: The temperature of the concrete placed during warm weather shall not exceed 85 degrees F. Special protection measures, approved by the Authorized Member Representative, shall be used if freezing temperatures are anticipated before the expiration of the specified curing period. Calcium chloride shall not be used.
- 3.4 Vibration: In the final phases of placing, surface vibrating equipment shall be used and the duration of vibration shall not exceed 20 seconds.
- 3.5 Joints shall be saw cut and in alignment with underlying existing joints.
- 3.6 Finishing:
  - 3.6.1 Transverse Finishing: Immediately after placement, the concrete shall be accurately struck off and screeded to such an elevation that, when consolidated and finished, the surface of the pavement will be free from porous places and will be at the required grade. The finishing machine shall make at least two trips over each area of pavement to compact the concrete and produce a surface of uniform texture, true to grade.
  - 3.6.2 Longitudinal Floating: After completion of the transverse finishing, the longitudinal mechanical float shall be operated to smooth and finish the pavement to grade.

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- 3.6.3 Hand finishing shall be done with an approved strike and tamping template and a longitudinal float.
- 3.6.4 Straightedge Finishing: After the longitudinal floating is completed but while the concrete is still plastic, minor irregularities and score marks in the pavement surface shall be eliminated by means of long-handled wood floats and straightedges. The final finish shall be made with the straightedges, which shall be used to float the entire pavement surface.
- 3.6.5 Broom Finishing: Burlap drag finishing will not be allowed as this brings the steel fibers to the surface. Finishing shall be accomplished using a stiff broom.
- 3.6.6 Edging: After other finishing has been completed, the edges of slabs along the forms and at the joints, where indicated or directed, shall be carefully finished with an edging tool to form a smooth rounded surface of the required radius.
- 3.7 Concrete Curing and Protection:
  - 3.7.1 Concrete curing methods shall consist of mat method, impervious sheeting method, or liquid membrane curing method.
  - 3.7.2 Concrete Protection: Repaired areas shall be protected against damage prior to final acceptance. Traffic shall be excluded from repaired areas.

**Asphaltic Concrete Overlays**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of asphaltic concrete overlays. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Asphalt Cement: The asphalt cement shall comply with ASTM D 946 penetration grade 85-100 requirements and shall show a negative spot test when tested in compliance with AASHTO T 102.
  - 2.2 Mineral Aggregates: Shall comply with ASTM D 3515 for 3/4-inch maximum aggregate mix.
  - 2.3 Test Properties: The bituminous mixture shall meet the following requirements when tested in compliance with applicable standards and/or regulations.

Stability minimum, lb	500
Flow maximum, 1/100-in. units	20
Voids total mix, %	3-5
Voids filled with bitumen, %	75-85
- 3.0 EXECUTION:
  - 3.1 Preparation of Existing Surface: The Contractor shall raise and reset all structures such as manhole frames, valve boxes, drainage structures, etc., to meet the required grade. An asphalt tack coat shall be applied to all contact surfaces in advance of the asphalt concrete overlay placement. The asphalt tack shall be placed at an asphalt residue coverage rate of 0.05 gal/sq yd.
  - 3.2 Installation:
    - 3.2.1 Joints: Longitudinal joints of the overlay shall be offset at least 1 foot from existing joints. Transverse joints shall be offset at least 2 feet from existing transverse joints.
    - 3.2.2 All asphalt concrete mixture and pavement that are contaminated, damaged, or defective shall be removed and replaced by the Contractor. Skin patching of rolled pavement will not be permitted.
    - 3.2.3 Compaction of Mixture: The asphalt concrete mixture shall be rolled until a density of not less than 95 percent and not more than 100 percent of laboratory compacted specimen is obtained.
    - 3.2.4 Surface Smoothness: After final rolling, the pavement surface shall not vary in excess of 1/8 inch from a 10-foot straightedge laid on the surface.

**Crushed Stone Paving**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of crushed stone paving. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:

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- 2.1 Aggregates: Aggregates shall consist of natural gravel, crushed stone or slag, crushed gravel, angular sand, or other approved materials. Aggregates shall be durable, sound, and free from foreign material, including objectionable coatings, lumps and balls of clay, and organic matter.
- 2.1.1 Coarse aggregates, consisting of angular fragments of uniform density and quality, shall have a percentage of wear not to exceed 50 percent after 500 revolutions when tested in accordance with ASTM C 131. The amount of flat and elongated particles (length to width greater than 3 to 1) shall not exceed 30 percent.
- 2.1.2 Crushed gravel shall be manufactured from gravel particles 50 percent of which by weight are retained on the maximum site gradation sieve specified.
- 2.1.3 Crushed stone shall contain at least 50 percent by weight of crushed pieces having two or more freshly fractured faces for each range of sizes.
- 2.1.4 Slag shall be an air-cooled blast-furnace product having a dry weight of not less than 65 pcf.
- 2.2 Binder material shall consist of screenings, angular sand, or other finely divided mineral matter processed or naturally combined with the coarse aggregate.
- 2.3 Gradation requirements specified in the following table shall apply to the completed aggregate surface. The table shows permissible gradings for granular material used in aggregate surface roads and airfields. Sieves shall conform to ASTM E 11. Aggregate used shall meet the following gradation limits or shall meet the gradation requirements of the applicable State Highway Department wherein the work is performed as approved by the Authorized Member Representative:  
Gradation for Aggregate Surface Courses

Sieve Designation	No. 1	No. 2	No. 3	No. 4
25.0 mm 1 in.	100	100	100	100
9.5 mm 3/8 in.	50-85	60-100	--	--
4.7 mm No. 4	35-65	50-85	55-100	70-100
2.0 mm No. 10	25-50	40-70	40-100	55-100
0.425 mm No. 40	15-30	24-45	20-50	30-70
0.075 mm No. 200	8-15	8-15	8-15	8-15

- 2.4 Liquid Limit and Plasticity Index: The portion of the completed aggregate surface course passing the No. 40 sieve shall have a maximum liquid limit of 35 and a plasticity index of 4 to 9.
- 3.0 EXECUTION:
- 3.1 Preparation: The previously constructed layer or base shall be cleaned of loose and foreign matter. Adequate drainage shall be provided. Ruts or soft spots shall be corrected. For cohesionless underlying materials, the surface shall be stabilized with aggregate prior to placement of the stabilized-aggregate course.
- 3.2 Installation:
  - 3.2.1 Mixing and Placing: Materials shall be mixed in such a manner as to obtain a uniform stabilized-aggregate material and a uniform optimum water content for compaction. Mixing and placing procedures shall produce true grades, minimize segregation and degradation, optimize water content, and ensure a satisfactory base course.
  - 3.2.2 Compaction: Each layer of stabilized-aggregate paving shall be compacted. Water content shall be maintained at optimum. Areas inaccessible to the rollers shall be compacted with mechanical tampers and shall be shaped and finished by hand methods.
  - 3.2.3 Layer Thickness: No layer shall be in excess of 8 inches nor less than 3 inches in compacted thickness.
  - 3.2.4 Proof Rolling: Materials in paving or underlying materials that produce unsatisfactory results by rolling shall be removed and replaced with satisfactory materials and recompacted.
  - 3.2.5 Edges of Paving: Approved materials shall be placed along edges of stabilized-aggregate paving course in such quantities as will compact to thickness of the course being constructed, allowing at least a 1-foot width of the shoulder to be rolled and compacted simultaneously with rolling and compacting of each layer of the paving course.
  - 3.2.6 Finishing: Finished surface shall be of uniform grade and texture.

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3.2.7 Thickness Control: Compacted thickness of the stabilized paving course shall be within 1/2 inch of the thickness required.

**Portland Cement Concrete Sidewalks**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of Portland cement concrete (PCC) sidewalks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Ready-Mixed Concrete: Ready-mixed concrete shall comply with ASTM C 94, Alternate No. 2. The concrete shall have a slump of not more than three inches. The concrete shall attain a minimum compressive strength of 2,500 psi at seven days.
  - 2.2 Aggregates: ASTM C 33.
  - 2.3 Reinforcement Steel: Wire mesh reinforcement shall comply with ASTM A 184.
  - 2.4 Expansion joint fillers: Expansion joint fillers shall comply with ASTM D 1751 or D 1752 or shall be resin impregnated fiberboard complying with ASTM D 1752.
  - 2.5 Joint Sealers: CE CRD-C-527.
- 3.0 EXECUTION:
  - 3.1 Reinforcement Steel: Fasten reinforcement steel accurately and securely in place with suitable supports and ties before the concrete is placed.
  - 3.2 Concrete Conveying: Convey concrete to construction areas by methods that will prevent segregation.
  - 3.3 Concrete Placing: Moisten the sub grade just before the concrete is placed. Place concrete in one layer of such thickness that when compacted and finished the sidewalk will be of the required thickness.
  - 3.4 Edge and Joint Finishing: Carefully finish all slab edges, including those at formed joints, with an edger having a radius of 1/8 inch.
  - 3.5 Contraction Joints: Divide the concrete surface into rectangular areas by means of contraction joints spaced at not more than five feet on center.
  - 3.6 Expansion Joints: Form expansion joints about structures and features that project through or into the sidewalk pavement. Fill expansion joints with joint filler of the type, thickness, and width to match existing or as directed by the Authorized Member Representative. Place the joint filler with the top edge 1/4 inch below the surface. Remove concrete over the joint filler.
  - 3.7 Joint Sealing: At the end of the curing period, carefully clean and seal expansion joints.
  - 3.8 Portland cement Concrete Curing: Cure new concrete by protection against loss of moisture and rapid temperature changes for a period of not less than 7 days.
  - 3.9 Backfilling: After curing, remove debris adjoining the sidewalk, backfill, grade, and compact to conform to the surrounding area.

**Asphaltic Concrete Sidewalks**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of asphalt concrete sidewalks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Asphaltic Concrete:
    - 2.1.1 Hot-Mixed, Hot-Laid Bituminous Paving Mixtures: ASTM D 3515.
    - 2.1.2 Plant-Mixed, Stockpiled Asphalt Cold Mixes: Asphalt Institute Manual MS-14.
  - 2.2 Bituminous Prime: ASTM D 2027, Grades MC-30 or MC-70; ASTM D 2028, Grade RC-70; or ASTM D 2026, Grade SC-70.
  - 2.3 Base Course: ASTM D 2940.
  - 2.4 Bituminous Tack Coat: ASTM D 977, Grades RS-1, MS-1 or SS-1h; ASTM D 2027, Grade MC-30;

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- ASTM D 2028, Grade RC-70; ASTM D 2026, Grade SC-70; or ASTM D 2397, Grades CRS-1 or CSS-1.
- 2.5 Seal Coat: ASTM D 2027, Grade MC-250 or MC-800; or D 2028, Grade RC-250 or RC-800.
  - 2.6 Slurry Coat Mixture shall be comprised of 70 percent sand or fine aggregate, 10 percent water, and 20 percent liquid or emulsified asphalt.
    - 2.6.1 Fine Aggregate: ASTM D 1073, Grade 2.
    - 2.6.2 Emulsified Asphalt: ASTM D 977, Grades SS-1 or SS-1h.
  - 3.0 EXECUTION:
    - 3.1 Application Temperatures: Application temperatures for all asphalt materials shall comply with provisions of the Asphalt Institute publications and the applicable ASTMs.
    - 3.2 Sub grade: Construct the sub grade or walkway replacement true to grade and compact as required.
    - 3.3 Base Course:
      - 3.3.1 Placing: Spread the base course material evenly upon the prepared sub grade, in a layer of such depth that when compacted the layer will be uniform and of the thickness required.
      - 3.3.2 Compaction: Immediately following the spreading of the material, compact the base course with equipment to a density as required.
    - 3.4 Surface Course:
      - 3.4.1 Placing: Apply prime coat, and allow it to cure. The placing of the mixture shall be continuous. Paint all contact surfaces of previously constructed sidewalk with a tack coat of rapid-setting liquid asphalt just before the fresh mixture is placed.
      - 3.4.2 Forms: Set forms with the upper edge true to line and hold grade rigidly in place by stakes placed on the outside of the forms and set flush with the top edge of the forms.
      - 3.4.3 Compaction: Immediately following the placement of the asphalt concrete mixture, compact the surface course with equipment to a density as required.
      - 3.4.4 Backfilling: After removing the forms and debris, backfill the exposed or excavated area adjoining the sidewalk with granular material, grade, and compact to conform to the surrounding area.
    - 3.5 Patching:
      - 3.5.1 For Repair Operations Involving Raveling, Heaving, Spalling, and Alligatoring: Cut asphalt concrete paving back to solid material, making cut area rectangular with vertical sides. Remove deteriorated pavement including base material if required. Replace base course, compact, and tack coat the base material and the vertical surfaces of cut area. Fill area with new asphalt concrete and compact level with existing walkway. Dust patched area with sand or mineral dust.
      - 3.5.2 Pothole Repair: Cut rectangular hole around pothole back to solid pavement leaving straight, vertical edges. Remove loose material and water to firm base. Fill holes and compact to within 3 inches of the surface in layers not exceeding 6 inches with either base material or asphalt mixture. Apply tack coat to base material and vertical edges. On the surface layer, fill with asphalt mixture and mound to such height that when compacted the mix will be level with surrounding walkway surface. Dust patched area with sand or mineral dust.
      - 3.5.3 Low Spot or Depression Repair: Determine limits of depression with straightedge, and mark outline with crayon. Apply tack coat, 0.05 to 0.15 gallon per square yard, to the cleaned area, and allow to cure. Spread area with asphalt concrete mix and feather edge by raking and manipulation of the material. Roll and compact area to surrounding walkway level. Recheck with straightedge. Apply a sand seal to the patched area to prevent entrance of water.
      - 3.5.4 Polished Aggregate Repair: Clean and dry area thoroughly. Apply tack coat at a rate of 0.05 to 0.15 gallon per square yard; overlay area with new asphalt concrete mix to a minimum 1-1/2 inch thickness and feather to adjoining walkway surfaces. Roll with pneumatic or steel rollers.
      - 3.5.5 Damaged Edging Repair: Remove damaged or deteriorated edging materials and replace.
      - 3.5.6 Prime Coat: Prime new base course with MC-70 liquid asphalt at a rate of 0.20 to 0.30 gallon per square yard. Take care to apply no more asphalt than will penetrate into the base course during curing. Blot excess prime with sand before the surfacing material is applied.
      - 3.5.7 Tack Coat: Surfaces and cut edges of existing asphalt concrete shall be given a tack coat of MC-70 liquid asphalt at a rate of 0.05 to 0.15 gallon per square yard. After application of the tack coat, allow time for the material to cure before surfacing and patching material is placed.
      - 3.5.8 Seal Coat Spray Application: Walkway surfaces that are to be sealed shall receive a liquid asphalt

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coat applied at a rate of 0.15 to 0.20 gallon per square yard, along with a fine aggregate at a rate of 15 to 20 pounds per square yard.

- 3.6 Crack Repair: Fill cracks with liquid asphalt, sand asphalt emulsion water mixture, or slurry seal. After thorough cleaning, work the mixture into cracks by broom or squeegee. Cracks 1/8 to 1/2 inch width shall be slurry sealed and filled with liquid asphalt. Dust repaired cracks with fine aggregate or mineral dust to prevent cracking. Final thickness of the slurry seal shall be 1/8 inch minimum.

**Miscellaneous Sidewalks**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of gravel, masonry, and wood sidewalks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Aggregate shall comply with the following:
    - 2.1.1 Surface Course Aggregates shall be well-graded, crushed stone, 3/4- to 1-1/4 inch size, consisting of clean, sound, durable particles.
    - 2.1.2 Masonry Grout Aggregate: ASTM C 404, Size 2.
  - 2.2 Base Course: Base course material shall be a granular, dense-graded, high-quality compactable material.
  - 2.3 Ready-Mixed Concrete: Ready-mixed concrete shall comply with ASTM C 94. The concrete shall attain a minimum compressive strength of 2,500 psi at 28 days.
  - 2.4 Portland cement Concrete: Cement shall comply with ASTM C 150.
  - 2.5 Joint Filler: Masonry joint filler shall be Portland cement concrete mix with cement complying with ASTM C 150.
  - 2.6 Masonry Units: Color and texture shall match the existing as nearly as is practicable.
  - 2.7 Wood and Preservatives: Footboards and supports shall be 1-1/2 inch thick Number 1 dense Douglas fir or yellow pine lumber, pressure-treated with chromate copper arsenate (CCA) preservative complying with AWPAs P5. Retention shall be a minimum of 0.25 pounds per cubic foot.
- 3.0 EXECUTION:
  - 3.1 Base Course Repair: Remove material in soft spots to such depth required to provide a firm foundation for surface materials and fill with granular material of a quality that will compact when moistened. Roll or tamp this material to obtain the proper density.
  - 3.2 Surface Repair:
    - 3.2.1 Aggregate Walkways: Spread the surface material evenly on the base course in a layer of such depth that when compacted, the layer will be uniform with a minimum thickness of 4 inches.
    - 3.2.2 Joint Filling: Completely remove and clean the joint of all loose joint material, dirt, clay, or other foreign matter. Fill the joint flush with concrete to provide a uniform surface.
    - 3.2.3 Wood Walkways: Secure wood members with galvanized nails, screws, bolts, or other approved fasteners to ensure tight joints.
    - 3.2.4 Masonry Walkways: New or salvaged masonry units will be placed on a 3/4-inch mortar setting bed with mortar joints matching the existing walkway. Place the setting bed on a fresh 3-inch thick Portland cement concrete slab.

**Precast Sidewalks and Pavers**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of precast sidewalks and pavers. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Precast Concrete Patio Blocks: Natural or colored, 2 inches thick.

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- 2.2 Exposed Aggregate or Granite: ASTM C 615 and National Building Granite Quarries Association, Inc.
- 2.2.1 Exposed Limestone: Limestone (Oolitic), ASTM C 568, Category II.
- 2.2.2 Exposed White Tumblestone Aggregate: As directed.
- 2.3 Stone Pavers:
  - 2.3.1 Bluestone Flagging Paver: Irregular cut, 1 inch thick.
  - 2.3.2 White Marble, Crushed Stone: ASTM C 503 and Marble Institute of America (MIA), 3 inches thick.
  - 2.3.3 Bluestone, Crushed Stone: 3 inches thick.
  - 2.3.4 Natural Cleft Slate: ASTM C 629, 3/4-inch irregular cut, 1/2-inch random rectangular cut, or 1/4-inch random rectangular butted joints.
- 2.4 Granite Blocks: Blocks shall be 3 to 5 inches thick and comply with requirements of ASTM C 615 and National Building Granite Quarries Association, Inc. Sizes shall be 3- 1/2 inches square; 4 to 12 inches by 3 to 5 inches; and 6 to 15 inches by 3 to 6 inches.
- 2.5 Mortar and Grout:
  - 2.5.1 Portland cement: ASTM C 150 and the staining requirements of ASTM C 91.
  - 2.5.2 Masonry Cement: ASTM C 91, non-staining.
  - 2.5.3 Hydrated Lime: ASTM C 207, Type S.
  - 2.5.4 Sand: ASTM C 144.
    - 2.5.4.1 White Pointing Mortar: Natural white sand or ground white stone.
    - 2.5.4.2 Colored Pointing Mortar: Marble, granite, or sound stone.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Clean stone or concrete block with clear water.
    - 3.1.2 Ferrous Metal: Apply a heavy coat of bituminous paint on metal surfaces in contact with block.
  - 3.2 Installation:
    - 3.2.1 Expansion Joints: Install continuous strips of preformed joint filler.
    - 3.2.2 Clean subbase and saturate with clean water.
    - 3.2.3 Slush Coat: Apply 1/16-inch thick slush coat of cement grout over concrete subbase about 15 minutes prior to placing setting bed.
    - 3.2.4 Setting Bed: Mix one 94-pound bag of cement to 3 cu ft of sand. Use only enough water to produce a moist surface when setting bed is ready for setting of stone. Spread and screed to a uniform thickness.
    - 3.2.5 Set stone or concrete block before initial set of cement bed occurs. Wet stone or block thoroughly before setting. Apply a thin layer of neat cement paste 1/32-inch to 1/16-inch thick to setting bed, or bottom of stone or block.
    - 3.2.6 Grout joints as soon as possible after initial set of setting bed and tool slightly concave. Use grout mix of one bag Portland cement to 2 cu ft sand. Cure grout by maintaining in a moist condition for 7 days. Do not permit traffic on surface during setting of units or for at least 24 hours after final grouting of joints.

**Concrete Curbs and Gutters**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of concrete curbs and gutters. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Concrete Curing Materials:
    - 2.1.1 Burlap: AASHTO M 182 having a weight of 14 ounces or more per square yard when dry.
    - 2.1.2 Impervious Sheeting: ASTM C 171.
    - 2.1.3 Liquid Membrane Curing Compound: ASTM C 309. Compound shall be free of paraffin or petroleum.
  - 2.2 Joint Materials:
    - 2.2.1 Expansion joint fillers: ASTM D 1751 or ASTM D 1752.
    - 2.2.2 Joint Sealers: CE CRD-C-527 or applicable standards and/or specifications.

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- 2.3 Concrete: Concrete shall have a minimum compressive strength of 3,000 psi. The maximum size of aggregate shall be 1-1/2 inches. Concrete shall have a slump of not more than 3 inches and an air content by volume of concrete of 3 to 6 percent.
- 2.4 Forms: Curb and gutter forms shall be of wood or steel. The outside forms shall have a height equal to the full depth of the curb or gutter. The inside form of curb shall have batter and shall be securely fastened to and supported by the outside form. Wood forms shall be surfaced plank, 2-inch nominal thickness, straight and free from warp, twist, loose knots, splits, or other defects. Corners, deep sections, and radius bends shall have additional stakes and braces, as required. Radius bends may be formed with 3/4-inch plywood. Steel forms shall be channel-formed sections with a flat top surface and with welded braces at each end and at not less than two intermediate points. Form ends shall be interlocked and self-aligning. Forms shall include flexible forms for radius forming, corner forms, form spreaders, and fillers.
- 3.0 EXECUTION:
  - 3.1 Preparation: The sub grade shall be constructed to grade and cross section. The sub grade shall be of materials equal in bearing quality to the sub grade under the adjacent pavement and shall be compacted. The sub grade shall be maintained in a smooth, compacted condition, in conformity with the required section and established grade until the concrete is placed. The sub grade shall be in a moist condition when concrete is placed.
  - 3.2 Installation:
    - 3.2.1 Form Setting: Forms for curbs shall be carefully set to alignment and grade and to conform to the dimensions of the curb. Clamps, spreaders, and braces shall be used where required to ensure rigidity in the forms.
    - 3.2.2 Concrete Placement and Finishing: Concrete shall be placed in layers not to exceed 6 inches. Concrete shall be thoroughly consolidated. The edges of the gutter and top of the curb shall be rounded with an edging tool to a radius of 1/2 inch, and the surfaces shall be floated and finished with a smooth wood float until true to grade and section and uniform in texture. Floated surfaces shall then be brushed with longitudinal strokes. Immediately after removing the front curb form, the face of the curb shall be rubbed. The surface shall be brushed in the same manner as the gutter and curb top. The top surface of gutter and entrance shall be finished to grade with a wood float. Expansion joints and contraction joints shall be constructed at right angles to the line of curb and gutter. Contraction joints shall be constructed by means of 1/8-inch thick separators, of a section conforming to the cross section of the curb and gutter. Contraction joints shall match joints in abutting Portland cement concrete pavement. At other pavements, construction joints shall be placed at not less than 5 feet nor greater than 15 feet apart. Expansion joints shall be formed by means of preformed expansion joint filler material cut and shaped to the cross section of curb and gutter. Expansion joints shall be provided in curb at the end of all returns. Expansion joints shall match expansion joints of abutting Portland cement concrete pavement. At other pavements, expansion joints at least 1/2 inch in width shall be provided at intervals not exceeding 45 feet. Exposed concrete surfaces shall be cured for not less than 7 days.
    - 3.2.3 Backfilling: After curing, debris shall be removed, and the area adjoining the concrete shall be backfilled, graded, and compacted.
    - 3.2.4 Sealing Joints: Expansion joints and the top 1-inch depth of contraction joints shall be sealed with joint sealer. The joint opening shall be thoroughly cleaned before the sealing material is placed. Excess material on exposed surfaces of the concrete shall be removed immediately and exposed concrete surfaces cleaned.

**Portland Cement Concrete**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of Portland cement concrete (PCC) pavements. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Ready-Mixed Concrete shall comply with ASTM C 94, Alternative No. 2. The concrete shall have a

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slump of not more than three inches. The concrete shall attain a minimum compressive strength of 2,500 psi at seven days.

- 2.2 Aggregates shall comply with ASTM C 33.
- 2.3 Air Entraining Admixtures shall comply with ASTM C 260.
- 2.4 Concrete Curing Materials shall comply with one of the following:
  - 2.4.1 Burlap: AASHTO M182.
  - 2.4.2 White, Opaque Polyethylene-Coated Burlap: ASTM C 171.
  - 2.4.3 White, Opaque Polyethylene Sheeting: ASTM C 171.
  - 2.4.4 White Waterproof Paper: ASTM C 171.
  - 2.4.5 Liquid Membrane Curing Compound: ASTM C 309.
- 3.0 EXECUTION: (Not used.)

**Bridge Deck Asphalt Concrete Wearing Surfaces**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of bridge deck asphalt concrete wearing surfaces. Products shall match those existing and/or as shall be directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work. The standard specification for highway construction for the state in which the project is located shall be considered the standard for material, equipment, details, and construction methods as supplemented hereafter.

2.0 PRODUCTS:

2.1 Aggregate:

- 2.1.1 Coarse Aggregate for Bituminous Mixtures: ASTM D 692.
- 2.1.2 Fine Aggregate for Bituminous Mixtures: ASTM D 1073.
- 2.1.3 Mineral Filler for Bituminous Mixtures: ASTM D 242.

2.2 Bituminous Materials:

- 2.2.1 Asphalt Cement: ASTM D 946, penetration grade 85-100.
- 2.2.2 Anionic Emulsified Asphalt: ASTM D 977, SS-1 or SS-1h.
- 2.2.3 Rapid Curing Type Liquid Asphalt: ASTM D 2028, RC-70 and RC-250.
- 2.2.4 Medium Curing Type Liquid Asphalt: ASTM D 2027, MC-30, MC-70, and MC 800.
- 2.2.5 Coal-Tar Pitch: Specific gravity shall be 1.20 to 1.27 at 77 degrees.
- 2.2.6 Coal-Tar Pitch Emulsion: ASTM D 3320.
- 2.2.7 Fiberglass Fabric: ASTM D 1668, Type II or III.

2.3 Asphalt Mixture:

2.3.1 Asphalt Seal Coat: RC-70 or MC-70 with following aggregate:

Sieve Size	Percent Passing (Wt.)
1/2-in.	100
3/8-in.	94-100
No. 4	15-45
No. 16	0-4

2.3.2 Asphalt Slurry Seal: SS-1 or SS-1h with following aggregate:

Sieve Size	Percent Passing (Wt.)
No. 8	100
No. 16	65-90
No. 30	40-60
No. 50	25-42
No. 100	15-30
No. 200	10-20

Mix shall contain not less than 15 percent asphalt emulsion nor more than 10 percent water by weight.

2.3.3 Asphalt Patch Mix: RC 250 or MC 800 with the following aggregate.

Sieve	Percent
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Size	Passing (Wt.)
3/4-in.	100
1/2-in.	85-100
No. 4	65-80
No. 8	50-65
No. 16	37-52
No. 30	25-40
No. 50	18-30
No. 100	10-20
No. 200	3-10

Liquid asphalt shall not be less than 5 percent by weight.

- 2.3.4 Coal-Tar Emulsion Slurry: The slurry shall not have more than 10 percent water or 5 pounds of aggregate per gallon of coal-tar emulsion. Aggregate shall have the following gradation:

Sieve Size	Percent Passing (Wt.)
No. 10	100
No. 16	30-65
No. 30	0-5

- 2.3.5 Asphalt-Sand Seal Protection Mix: Asphalt cement penetration shall be grade 85-100 with the following aggregate.

Sieve Size	Percent Passing (Wt.)
3/8-in.	100
No. 4	97-100
No. 10	80-95
No. 40	50-70
No. 80	25-40
No. 200	8-10

3.0 EXECUTION:

3.1 Preparation:

- 3.1.1 Traffic Control: When traffic is maintained on bridge under repair or is directed over a temporary run-around, furnish, erect, and maintain all barricades, flags, torches, lights, guardrails, temporary pavement markings, and traffic control signs required for the protection of the public and for the direction of traffic. Number, type, color, size, and placement of all traffic control devices and the use of a flagman shall comply with USDOT FHA MUTCD "Traffic Controls for Highway Construction and Maintenance Operations." All traffic control devices in advance of the construction limits shall also be the responsibility of the Contractor.

3.1.2 Removal of Damaged or Deteriorated Materials:

- 3.1.2.1 Cleaning for Crack Filling and Slurry Seals: The area shall be swept with stiff bristle brooms and blown clean. Cracks shall be cleaned to the maximum depth possible and made free from any dirt, stones, or other foreign matter.

- 3.1.2.2 Removal of Deteriorated Material for Patching: Areas to be patched shall extend a minimum of 1 foot into sound surfacing around the perimeter. Saw cut to minimum 3/4 inch deep along all edges of areas delineated to be patched. Remove loose and unsound material completely to the support structure.

- 3.1.2.3 Preparation for Waterproofing Structural Deck: Remove existing asphalt wearing course and membrane completely to the support structure. Surface shall be smooth and free from projections that might damage the waterproofing membrane.

3.2 Maintenance and Repair Methods:

- 3.2.1 Filling and Sealing Cracks: Fill the cracks to within 1/8 inch of the surface with asphalt emulsion slurry. Allow the slurry to cure completely before sealing. Seal cracks with liquid asphalt RC-70. The surface of the sealant shall be sprinkled with dry sand to prevent tracking.

- 3.2.2 Seal Coating: Spray asphalt emulsion seal coat uniformly over the repair area at the rate of 0.15 to 0.25 gallon per square yard after all cracks in the repair area are filled. Immediately following the

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application of the asphalt emulsion, spread seal coat aggregate uniformly over the treated surface at the rate of 15 to 25 pounds per square yard. Compact by rolling the entire surface. Upon the completion of the work, no loose aggregate shall be allowed to remain on the surface. Allow the sealed area to cure thoroughly before opening to traffic.

- 3.2.3 Slurry Seal Coating: Where cracks exceed 1 inch in depth or 1/2 inch in width, or both, they shall be filled with the slurry mixture and allowed to cure before placing the slurry seal. Place slurry mixture evenly over area to be sealed. Final thickness of the slurry seal shall be between 1/16 inch and 1/8 inch. Where two applications of the slurry seal are required, allow the initial application to cure before placing the succeeding application.
- 3.2.4 Patching Asphalt Concrete Surface:
  - 3.2.4.1 Prime Coat: Prime the entire area of patch, including vertical faces, with liquid asphalt RC-70.
  - 3.2.4.2 Placing and Compacting Asphalt Patch Mix: Place sufficient material in the patch area to ensure that the patch surface will not be below that of the adjacent material after compaction. Where the thickness of the finished compacted patch is greater than 3 inches, spread and compact the mixture in 2 or more layers.
- 3.2.5 Waterproofing Structural Deck: The waterproofing membrane system shall consist of a penetrating primer, a built-up coal-tar pitch emulsion membrane with 2 plies of coated glass fabric, and a 1/2-inch asphalt-sand seal protection layer.

**Crack Sealing of Asphalt Concrete Pavements**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for crack sealing of asphalt concrete pavements. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Liquid Asphalt shall comply with ASTM D 2027, Grade MC-250.
  - 2.2 Emulsified Asphalt shall comply with ASTM D 977, Grade MS-2.
  - 2.3 Sealing Compound shall comply with applicable standards and/or specifications.
  - 2.4 Fine Aggregate shall be natural sand or crusher dust and have a maximum size of not more than 1/8 inch and be free of clay or organic matter.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 All Cracks to be sealed shall be cleaned of dirt and debris.
    - 3.1.2 Crack Cleaning Equipment shall consist of a portable air compressor with hose and nozzles for directing air directly into cracks and stiff bristle brooms.
    - 3.1.3 Heating Equipment for Liquid Asphalt shall be mobile and shall be equipped with an agitating device for stirring material during heating, a thermometer, regulating equipment for heat control, and a gravity-type draw-off valve.
    - 3.1.4 Heating Equipment for Sealing Compound: Unless otherwise required by the manufacturer's recommendations, the equipment shall be mobile and shall consist of double-boiler, agitator-type kettles with oil medium in the outer space for heat transfer. The applicator unit shall be so designed that the sealant will circulate through the delivery hose and return to the inner kettle when not sealing cracks.
    - 3.1.5 Application Equipment shall have a spout or nozzle of such size that the sealing material will be placed in the cracks without entrapping air in cracks or spreading material on adjacent pavement surface.
  - 3.2 Installation:
    - 3.2.1 Sealing Compound: All cracks 1/8 inch wide and wider shall be sealed. The application temperature for sealing compound shall comply with applicable standards and/or specifications. Cracks 1/2 inch wide and wider shall be filled with a slurry of fine sand and an emulsified asphalt or liquid asphalt. After the slurry has cured, cracks shall be sealed with liquid asphalt or emulsified asphalt and lightly sanded.
    - 3.2.2 Liquid and Emulsified Asphalt Sealer: The temperature shall be varied so that it flows freely into

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cracks and completely fills cracks without entrapping air. Cracks shall be free of moisture before filling and shall be filled slightly above the pavement surface. When excess sealer has been removed, the sealer shall be covered with fine sand.

- 3.2.3 Traffic Control: Traffic will not be permitted over sealed cracks until the sealer has cooled so that it is not picked up by vehicle tires. The Contractor will be responsible for all barricades and flagmen necessary to control traffic.

**Patching of Asphalt Concrete Pavements**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for patching of asphalt concrete pavements. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Asphaltic Concrete:
- 2.1.1 Hot-Mixed, Hot-Mixed Asphaltic Concrete and Emulsified Asphalt shall comply with requirements of ASTM D 3515.
- 2.1.2 Plant-Mixed, Stockpiled Asphalt Cold Mixes shall comply with the requirements of Asphalt Institute Specification PM-2.
- 2.2 Bituminous Prime: Bituminous prime shall comply with ASTM D 2027.
- 2.3 Base Course: Base course material shall comply with local highway department specification for dense-graded, high-quality material.
- 2.4 Bituminous Tack Coat: Bituminous tack coat shall comply with ASTM D 2027.
- 3.0 EXECUTION:
- 3.1 Preparation of Areas for Patching:
- 3.1.1 Pot Holes: Trim the perimeter of each hole to a vertical face and back to well-compacted material. Remove material to a depth that provides a uniform well-compacted bottom surface. Remove all loose material resulting from trimming or otherwise existing in the hole. Areas to be repaired are to be dry before repair is started.
- 3.1.2 Alligator-Cracked and Rutted Areas: The pavement shall be sawed or cut with pavement breakers to a smooth vertical face 1 foot outside of the alligator-cracked areas. Unsatisfactory material shall be removed in a manner not to disturb the sides of the excavated area.
- 3.1.3 Slippage Areas: Saw a rectangular area around the slippage area that overlaps into the well-bonded material by at least 1 foot. The depth of the saw cut shall be equal to the thickness of the layer of material that is slipping. The surface where slipping is occurring shall be broomed clean and all loose material removed.
- 3.2 Installation:
- 3.2.1 Application Temperatures: Application temperatures for all asphalt material shall comply with provisions of the Asphalt Institute Publications and the applicable ASTM.
- 3.2.2 Base Course: Place base course material in layers not exceeding a compacted thickness of 6 inches. After placing, compact each layer by mechanical compactors to a density of not less than the density of the corresponding layer of the adjacent pavement structure.
- 3.2.3 Prime Coat: Prime base course with MC-70 liquid asphalt at a rate of 0.20 to 0.30 gallon per sq. yd. Bolt excess prime with sand before the surfacing material is applied.
- 3.2.4 Tack Coat: Give the edges of existing asphaltic concrete or surfaces of Portland cement concrete and asphaltic concrete a tack coat of MC-70 liquid asphalt at a rate of 0.05 to 0.15 gallon per sq. yd. Allow the material to cure before placing the surfacing material.
- 3.2.5 Hot-Mixed Asphaltic Concrete: Place the material in layers not exceeding 2-1/2 inches in thickness and compact to a density equal to the density of the adjacent asphaltic concrete.
- 3.2.6 Stockpiled Cold Mixes: The compacted thickness of each layer of material shall not exceed 2 inches. Before compaction, the material shall be allowed to aerate, if necessary, until the proper amount of cohesion has developed to obtain adequate compaction. When more than one layer is used, each layer shall be thoroughly cured before the succeeding layer is placed.

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**Spray Applications, Seal Coats and Surface Treatments**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for the spray applications, seal coats, and surface treatments of asphalt concrete pavements. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Bituminous Material: Bituminous material shall be liquid asphalt complying with ASTM D 2028, Grade RC-250, or tar complying with ASTM D 490, Grade RT-6.
  - 2.2 Aggregate: Aggregates shall consist of crushed stone, crushed gravel, or crushed slag. The moisture content of the aggregate shall be such that the aggregate will be readily coated with the bituminous material. Aggregate gradations shall be in compliance with ASTM C 136.
  - 2.3 Construction Equipment:
    - 2.3.1 Bituminous distributor shall be designed and equipped to distribute the bituminous material uniformly at even heat on variable widths of surface at readily determined and controlled rates from 0.05 to 2.0 gal/sq yd with a pressure range of from 25 to 75 lb/sq in. and with an allowable variation from any specified rate not exceeding 5 percent.
    - 2.3.2 Single pass surface treatment machine shall be capable of distributing the bituminous material and aggregates uniformly in controlled amounts in a single pass operation over the surface to be sealed.
    - 2.3.3 Heating equipment for storage tanks shall consist of steam coils, hot oil coils, or electrical coils. If steam or hot oil coils are used, the coils must be so designed and maintained that the bituminous material cannot become contaminated.
    - 2.3.4 Power rollers shall be the self-propelled tandem and three-wheel type rollers, weighing not less than 5 tons and shall be suitable for rolling bituminous pavements.
    - 2.3.5 Self-propelled pneumatic-tired rollers shall have a total compacting width of not less than 60 inches. The gross weight shall be adjustable within the ranges of 200 to 350 lb/in. of compacting width.
    - 2.3.6 Spreading Equipment: Aggregate spreading equipment shall be adjustable and capable of spreading aggregate at controlled amounts per square yard.
    - 2.3.7 Drags: Broom drags shall consist of brooms mounted on a frame, designed to spread fine aggregate uniformly over the surface of a bituminous pavement. Towing equipment shall have pneumatic tires.
    - 2.3.8 Brooms and blowers shall be of the power type and shall be suitable for cleaning surfaces of bituminous pavements.
- 3.0 EXECUTION:
  - 3.1 Preparation of Surface:
    - 3.1.1 Immediately before application of the spray, all loose material, dirt, clay, or other objectionable material are to be removed from the surface with a power broom or blower supplemented with hand brooms. Correct all deficient areas such as pot holes, depressions, and excessive cracking.
    - 3.1.2 Application of Bituminous Material: Immediately following the preparation of the surface, apply the bituminous material uniformly over the entire surface to be treated. All spots missed by the distributor shall be properly treated with bituminous material.
    - 3.1.3 Application Temperature: Application temperatures for all materials shall comply with provisions of the Asphalt Institute Publications and the applicable ASTMs.
  - 3.2 Installation:
    - 3.2.1 Spreading Aggregate: Application of seal aggregate shall immediately follow the application of bituminous material, and in no case shall the time to application exceed 15 minutes.
    - 3.2.2 Brooming and Rolling: Begin the rolling operations immediately following the application of cover aggregate. Rolling shall be accomplished with pneumatic-tired rollers; steel-wheeled rollers shall be used in a supplementary capacity only. All surplus aggregate shall be swept off the surface and removed not less than 24 hours or more than four days after rolling is completed.

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**Slurry Seals**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for slurry seals for asphalt concrete pavements. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Project materials, design, material proportions, mix composition, and mix property requirements shall comply with current state slurry seal specifications.
- 3.0 EXECUTION:
  - 3.1 Preparation of Surface:
    - 3.1.1 Cleaning: Clean the existing surface prior to application of a tack coat or slurry seal mixture.
    - 3.1.2 Repair: Repair all unsatisfactory or defective areas prior to application of a tack coat or slurry seal mixture.
    - 3.1.3 Tack Coat: Apply a tack coat, with a bituminous distributor at the rate of 0.05 gal per sq yd., after the surface is repaired and cleaned. The tack coat shall consist of one part emulsion and three parts water and shall be the same type and grade emulsion as used in the slurry seal mixture. The tack shall be cured before application of the slurry seal mixture.
  - 3.2 Installation:
    - 3.2.1 Preparation and Application of Slurry Seal: Mix and apply the slurry seal mixture with a self-propelled continuous flow unit calibrated to accurately deliver and thoroughly mix the required proportion of aggregate, emulsion, water, and mineral filler. Total mixing time shall not exceed four minutes, and no violent mixing shall be permitted. A water fog spray shall immediately precede application of the slurry seal mixture. The slurry seal mixture shall show no signs of segregation during mixing or placing. The slurry seal mixture shall be free of uncoated or oversized aggregate, lumps, or premature breaking of the emulsion when placed. The average thickness of the cured slurry seal, when measured over the pavement surface, shall be 1/4 inch. The slurry seal minimum thickness shall not be less than 1/8 inch.
    - 3.2.2 Drags: The drag shall be of a burlap material and shall be cleaned or replaced to prevent accumulations of slurry seal mix.
    - 3.2.3 Rolling: Roll the slurry seal mix a minimum of five coverages with a pneumatic roller.
    - 3.2.4 Curing: Protect the slurry seal mix from traffic until cured.
    - 3.2.5 Correcting Deficient Areas: Any slurry seal that becomes contaminated, segregated, defective, or damaged before final acceptance by the Authorized Member Representative shall be removed and replaced by the Contractor.
  - 3.3 Weather Limits: Air and pavement temperatures shall be 60 F and rising prior to the application of the slurry seal mixture.

**Asphalt Curbs**

- 1.0 DESCRIPTION OF WORK: This specification covers construction of asphaltic concrete curbs in conformity with the lines, grades, and dimensions shown on the plans or established by the Authorized Member Representative. The standard specification for highway construction for the state in which the project is located shall be considered the standard for material, equipment, details, and construction methods as supplemented hereafter.
- 2.0 PRODUCTS:
  - 2.1 Asphalt Cement: ASTM D 946, penetration grade 60-70 or 85-100.
  - 2.2 Coarse Aggregate: ASTM D 692.
  - 2.3 Fine Aggregate: ASTM D 1073.
  - 2.4 Mineral Filler: ASTM D 242.
  - 2.5 Composition of Mixture: The asphaltic concrete mixture shall consist of aggregates, filler if needed, and asphalt cement combined in such proportions that the composition by weight of the finished mixture shall be within the limits specified by the state in which the project is located.
- 3.0 EXECUTION: The curb shall be placed in position on a primed surface by means of an approved automatic curb machine which shapes and compacts the mixture to the designated cross section. The placement temperature of the mixture shall be approximately 260 F. Any required joints shall

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be carefully made in such manner as to ensure a continuous bond between the old and new sections of the curb. The newly laid curb shall be protected from traffic by barricades or other suitable methods until the heat of the asphalt mixture has dissipated. Immediately after the asphalt curb has hardened, it shall be backfilled where required with suitable material.

**Cold Milling of Bituminous Pavements**

- 1.0 DESCRIPTION OF WORK: This specification covers the removal of the existing bituminous surface by cold milling to the depths and limits shown on the drawings or as established by the Authorized Member Representative. It also includes the loading and stockpiling, if required, of the milled material.
- 2.0 PRODUCTS: (Section not used).
- 3.0 EXECUTION:
  - 3.1 Equipment, Tools, and Machines:
    - 3.1.1 Cold-Milling Machine: The cold-milling machine shall be a self-propelled machine capable of milling the pavement to a specified depth and smoothness. The milling machine shall have effective means of controlling transverse slope and controlling dust produced during the pavement milling operation. The milling machine shall not cause damage to any part of the pavement structure that is not to be removed.
    - 3.1.2 Cleaning Equipment: All cleaning equipment shall be suitable for removing and cleaning loose material from the pavement surface.
  - 3.2 Grade: The finished mill surfaces shall conform to the lines, grades, and cross sections indicated. Finished surfaces at a juncture with other pavements shall coincide with the finished surfaces of the abutting pavements.
  - 3.3 Preparation of Surface: The pavement surface shall be cleaned of excessive dirt, clay, or other foreign material immediately prior to milling the pavement.
  - 3.4 Milling Operation: Sufficient passes shall be made so that the designated area is milled to the grades and cross sections indicated. Any items, such as manholes, valve boxes, and utility lines, damaged or any pavement that is torn, gouged, broken, or undercut shall be repaired or replaced as directed by the Authorized Member Representative.

**Bituminous Rejuvenation**

- 1.0 DESCRIPTION OF WORK: This specification covers the rejuvenation of existing bituminous airfield pavements, roads, streets, parking areas, and other general applications by the use of a chemical rejuvenator.
- 2.0 PRODUCTS:
  - 2.1 Rejuvenator: The asphalt rejuvenating agent shall be composed of a petroleum resin-oil base uniformly emulsified with water and shall conform to the following physical and chemical requirements:  
Property Test Method Requirement  
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Viscosity, S.F. at 77 F, sec.	ASTM D 244 15-40
Residue, % (1)	ASTM D 244 (Mod.) 60-65(min.)
Sieve Test, %	ASTM D 244 (Mod.) 0.10 (max.)
Viscosity @ 140 F, centistokes (2)	ASTM D 2170 80-500
Flash Point, Cleveland Open Cup (COC), of (3)	ASTM D 92 350 (min.)
- 3.0 EXECUTION:
  - 3.1 Bituminous Storage Tanks shall be capable of heating the bituminous material under effective and positive control at all times to the required temperature.
  - 3.2 Bituminous Distributor shall be designed and equipped to spray the bituminous material in a uniform double to triple lap at the temperature recommended by the manufacturer, at variable widths, and at readily determined and controlled rates from 0.04 to 0.2 gallons per square yard, plus or minus 5 percent.
  - 3.3 Brooms and blowers shall be of the power type.
  - 3.4 Preparation of Surface: Immediately before applying the rejuvenator, all loose material, dirt, clay, or

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- other objectionable material shall be removed from the surface to be treated.
- 3.5 Application of Rejuvenator: The rejuvenator shall be uniformly applied over the surface at the approved rate with an allowable variation of plus or minus 20 percent. Materials shall be applied at the temperature recommended by the manufacturer.
  - 3.6 Excess Rejuvenator Material: Approved mineral aggregate shall be provided by the Contractor and shall be spread in sufficient quantity to effectively blot up any excess rejuvenator material remaining on the treated pavement surface after 24 hours.
  - 3.7 Insufficient Rejuvenator Material: When it is determined by the Authorized Member Representative that the actual application rate of the rejuvenator is more than 20 percent below the approved application rate, subsequent application(s) shall be made within 24 hours to ensure adequate penetration into the pavement surface.

**Cold Mix Recycling**

- 1.0 DESCRIPTION OF WORK: This specification covers the cold mix recycling of existing paving and the addition of new materials, as required, or as directed by the Authorized Member Representative.
- 2.0 PRODUCTS:
  - 2.1 Aggregates:
    - 2.1.1 General: Aggregates shall consist of material obtained from milling, or removing and crushing the existing in situ material, and/or new aggregate material as needed.
    - 2.1.2 Aggregate Quality and Gradation: Aggregate for bituminous mixture shall be of such size that the material can be spread with a paver to the desired thickness and compacted to meet the specified smoothness, grade, and density requirements. New aggregates shall be approved and be equal to or better than the reclaimed aggregate in quality. Maximum size of new aggregate shall not exceed one-half of the layer thickness and in no case shall the maximum aggregate size exceed 1 inch.
  - 2.2 Bituminous Materials: Bituminous materials, if required, shall be an emulsified asphalt conforming to ASTM D 977 or ASTM D 2397, grade as required.
  - 2.3 Job-Mix Formula: The Job-Mix Formula (JMF) for the recycled mixture will be furnished by the Contractor to the Authorized Member Representative. The formula will indicate a definite percentage of water and asphalt to be added to the mixture. The JMF will be allowed an asphalt content tolerance of 0.3 percent. The asphalt content may be adjusted by the Authorized Member Representative to improve paving mixture, without adjustment in contract unit price. When asphalt is added, the optimum asphalt content will be selected to provide the following properties when samples are compacted at 250 F with 75 blows of standard Marshall hammer on each side of the specimen. Property Requirement

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Stability minimum, pounds	1,800
Flow maximum, 1/100-inch units	16
Voids in total mix, percent	3-5
Voids filled with bitumen, percent	70-80

The water content will be selected to provide maximum density when samples are prepared at the optimum asphalt content and compacted with 75 blows of Marshall hammer at ambient temperature. When no asphalt binder is added to the mixture, the water content will be selected by the Authorized Member Representative to provide maximum density.

- 3.0 EXECUTION:
  - 3.1 Preparation of Bituminous Mixtures: The required amount of bituminous material for each batch, or calibrated amount of continuous mixing, shall be introduced into the mixer. Aggregates, asphalt emulsion, and water shall be mixed for 35 seconds or longer, as necessary, to thoroughly coat all particles with bituminous material. When longer mixing time is necessary, additional mixing times all be determined by the Authorized Member Representative.
  - 3.2 Conditioning of Existing Surface: Ruts or soft yielding spots that appear in the existing pavement areas and deviations of surface from requirements specified shall be corrected. An asphalt tack coat shall be applied to all contact surfaces in advance of the recycled overlayment. The asphalt tack shall be placed at an asphalt residue coverage rate of 0.05 gal/sq. yd.
  - 3.3 Placing:

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- 3.3.1 Layer Thickness and Curing: Each layer of compacted mixture shall be no more than 2-1/2 inches in thickness; each layer of bituminous mixture shall be allowed to cure for at least 5 days before placing a succeeding layer.
- 3.3.2 Compaction of Mixture: Bituminous mixtures shall be rolled until all roller marks are eliminated and a density of at least 86 percent of the theoretical maximum density has been obtained when tested in accordance with ASTM D 2041. When bituminous material is not added to the cold recycled mixture, the material shall be compacted to 100 percent of density determined by ASTM D 2041, compaction effort designation CE-55. 3.3.3 Joints: Longitudinal joints shall be offset at least 1 foot from existing joints. Transverse joints shall be offset at least 2 feet from existing transverse joints.
- 3.3.4 Surface Smoothness: After final rolling, the pavement surface shall not vary in excess of 1/8 inch from a straightedge laid on the surface.

**Central Plant Hot Mix Recycling**

- 1.0 DESCRIPTION OF WORK: This specification covers the central plant hot-mix recycling of existing asphalt concrete intermediate and wearing courses for airfields, heliports, and heavy-duty pavements. The specification also includes the addition of new materials, as required or as directed by the Authorized Member Representative.
- 2.0 PRODUCTS:
  - 2.1 Aggregates:
    - 2.1.1 General: Aggregates shall consist of material obtained from milling, or removing and crushing the existing in-situ material, and/or new aggregate material as needed.
    - 2.1.2 Aggregate Quality and Gradation: Aggregate for the bituminous mixture shall be such size that the material can be spread with a paver to the desired thickness and compacted to meet the specified smoothness, grade, and density requirements. New aggregates shall be approved and shall be equal to or better than the reclaimed aggregate in quality. Maximum size of new aggregate shall not exceed one-half of the layer thickness, and in no case shall the maximum aggregate size exceed one inch. Aggregate gradations shall be as prescribed by local usage, with the approval of the Authorized Member Representative. In order to meet pollution requirements and ensure the recycled mixture is satisfactory, the amount of reclaimed asphalt pavement shall not exceed 60 percent for drum mixers or 50 percent for batch plants.
  - 2.2 Mineral Filler shall conform to ASTM D 242.
  - 2.3 Bituminous Materials:
    - 2.3.1 New Asphalt Cement: The appropriate types and grades of bituminous materials for the anticipated use and climactic environment shall be used. Requirements of ASTM D 946 shall be used to specify penetration-graded asphalt cement, or ASTM D 3381 for viscosity-graded asphalt cement.
    - 2.3.2 Recycled Asphalt Cement: The penetration of asphalt cement recovered from the recycled mixture shall be in accordance with ASTM D 1856 and shall have a penetration between 50 and 70 percent of that specified for the particular region for new asphalt cement, measured in accordance with ASTM D 5.
  - 2.4 Job-Mix Formula (JMF): The JMF for the recycled mixture will be furnished by the Contractor to the Authorized Member Representative. The formula will indicate the percentage of reclaimed asphalt pavement, the percentage of bitumen, and the temperature of the completed mixture when discharged from the mixer. The requirements for stability, flow, and voids are shown in the following tables for nonabsorptive and absorptive mixtures, respectively.

Nonabsorptive-Aggregate Mixture

	Wearing Property Course	Intermediate Course
Stability minimum, lbs	1,800	1,800
Flow maximum, 1/100-inch units	16	16
Voids total mix, percent	3-5	5-7
Voids filled with bitumen, percent	70-80	50-70

Absorptive-Aggregate Mixture

	Wearing	Intermediate
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	Property Course	Course
Stability minimum, lbs.	1,800	1,800
Flow maximum, 1/100-inch units	16	16
Voids total mix, percent	2-4	4-6
Voids filled with bitumen, percent	75-80	55-75

When the water-absorption value of the entire blend of aggregate does not exceed 2.5 percent, the aggregate is designated as nonabsorptive. When the water-absorption value exceeds 2.5 percent as determined by ASTM C 127 and ASTM C 128, the aggregate is designated as absorptive.

3.0 EXECUTION:

3.1 Preparation of Bituminous Mixtures: Aggregates, reclaimed asphalt pavement, mineral filler, bitumen, and recycling agent shall be conveyed into the mixer in proportionate quantities required to meet the JMF. Particles larger than 2 inches shall be removed from the reclaimed asphalt pavement prior to being added to the mixer. Mixing time shall be as required to obtain a uniform coating of the aggregate with the bituminous material. Temperature of bitumen at time of mixing will be specified by the Authorized Member Representative. Temperature of aggregate and mineral filler in the mixer shall not exceed 325 F when bitumen is added. 3.2 Surface Preparation of Underlying Course: Prior to placing of intermediate or wearing course, the underlying course shall be cleaned of all foreign or objectionable matter. The surface of previously constructed base course shall be sprayed with a prime coat at an asphalt residue coverage rate of 0.25 gal/sq. yd. Contact surfaces of previously constructed pavement, curbs, manholes, and other structures shall be sprayed with a thin tack coat at an asphalt residue coverage rate of 0.05 gal/sq. yd.

3.3 Placing:

3.3.1 Layer Thickness and Curing: A required uncompacted thickness of intermediate course, 7 inches or less, may be spread and compacted in one layer. Where the required thickness of base is more than 7 inches, the mixture shall be spread and compacted in two or more layers. Each layer of compacted mixture for the surface course shall be no more than 2-1/2 inches in thickness. Each layer of bituminous mixture shall be allowed to cure for at least 5 days before placing a succeeding layer.

3.3.2 Compaction of Mixture: Rolling shall begin as soon after placing as the mixture will bear roller without undue displacement. After the Contractor is assured of meeting crown, grade, and smoothness requirements, rolling shall be continued until a mat density of 98 to 100.0 percent and a joint density of 96.5 to 100.0 percent of density is obtained. Places inaccessible to rollers shall be thoroughly compacted with hot hand tampers.

3.3.3 Joints: Longitudinal joints shall be offset at least 1 foot from existing joints. Transverse joints shall be offset at least 2 feet from existing transverse joints.

3.3.4 Surface Smoothness: After final rolling, the pavement surface shall not vary in excess of 1/8 inch from a straightedge laid on the surface.

**Pavement Markings**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and replacement of pavement markings. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 General: Paint and reflective media shall be in sealed containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacturer, manufacturer's name, formulation number, and directions, all of which shall be plainly legible at time of use. The paint shall be homogeneous and easily stirred to smooth consistency. Paint that is older than one year shall not be used.

2.2 Paint:

2.2.1 Paint for Roads and Streets shall comply with applicable standards and regulations, and shall be acceptable to the Authorized Member Representative.

2.2.2 Paint for Airfields shall comply with applicable standards and regulations, and shall be acceptable to

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- the Authorized Member Representative.
- 2.3 Reflective Media for Roads and Streets shall comply with applicable standards and regulations, and shall be acceptable to the Authorized Member Representative.
  - 2.4 Thermoplastic Materials shall comply with AASHTO M 249.
  - 2.5 Raised Pavement Markers shall comply with the Federal Highway Administration Manual on Uniform Traffic Control Devices:
    - 2.5.1 Reflective Pavement Markers: Reflective pavement markers shall be of the prismatic reflector type, consisting of a high impact plastic shell filled with a mixture of inert thermosetting compound and filler material.
    - 2.5.2 Non-reflectorized Pavement Markers: Nonreflective pavement markers shall consist of a heat fired, white, vitreous, ceramic base and a heat-fired, opaque, glazed surface to produce the properties in these specifications.
  - 2.6 Adhesive for Installation of Raised Pavement Markers shall comply with AASHTO M 237.
- 3.0 EXECUTION:
- 3.1 Preparation:
    - 3.1.1 Safety and Protection: Contractor shall assure the least possible obstruction to traffic.
    - 3.1.2 Removal of Existing Pavement Marking: Remove paint, plastic markings, and raised markers by sandblasting, infrared heat, high pressure water, and water or scraping. Heat may be used to augment scraping; however, the underlying pavement shall not be burned.
  - 3.2 Installation:
    - 3.2.1 Thermoplastic Applicator: Utilize extrusion or spray application equipment for applying thermoplastic material to the pavement. The equipment shall provide for varying widths of traffic markings.
    - 3.2.2 Bead Dispensers: Attach bead dispensers to the striping machine in such a manner that the beads are dispensed almost instantaneously upon the installed line.
    - 3.2.3 Tolerances in Dimensions and in Alignment: The length of the painted segment for skip stripe and the gap between segments may each vary plus or minus one foot, except that over-tolerance and under-tolerance lengths shall approximately compensate.
    - 3.2.4 Protection: Adequate warning signs, flagmen, and necessary precautions for the protection of the wet paint and the safety of the public shall be provided. Cones, rubber "Z" guards or similar protective devices shall be placed along the newly painted stripe to prevent traffic from crossing the wet paint.
    - 3.2.5 Corrective Measures: Stripes that fail to meet the specifications, including the permissible tolerances and the appearance requirements, or are marred or damaged by traffic or from other causes, shall be corrected. Drip and spattered paint shall be removed.

**Water Lines**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of water lines. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Piping for water service lines shall be galvanized steel, polyvinyl chloride (PVC) plastic, polyethylene, polybutylene, or copper tubing. Piping for water distribution and supply lines shall be ductile iron, polyvinyl chloride (PVC) plastic, filament-wound reinforced or centrifugally cast reinforced thermosetting resin, thermosetting reinforced plastic mortar pressure pipe, or reinforced concrete.
  - 2.1 Copper Tubing: ASTM B 88, Type K, annealed, with compression pattern flared joints.
  - 2.2 Ductile Iron Pipe: AWWA C151, 150 psi working pressure. Pipe shall be cement-mortar lined in accordance with AWWA C104. Joints shall conform to AWWA C111. Flanges shall conform to AWWA C115.
  - 2.3 Polyvinyl Chloride (PVC) Plastic Pipe: All pipe, couplings, and fittings shall be manufactured of material conforming to ASTM D 1784, Class 12454B, designated as PVC 1120 in ASTM D 1785.
    - 2.3.1 Pipe Less Than 4 Inches in Diameter:
      - 2.3.1.1 Screw Joint: ASTM D 1785, Schedule 80, with joints meeting requirements of 150 psi working

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- pressure, 200 psi hydrostatic test pressure.
- 2.3.1.2 Elastomeric Gasket Joint: ASTM D 1785, Schedule 40, with joints meeting the requirements of 150 psi working pressure, 200 psi hydrostatic test pressure.
  - 2.3.1.3 Solvent Cement Joint: ASTM D 1785 or D 2241, with joints meeting the requirements of 150 psi working pressure and 200 psi hydrostatic test pressure.
  - 2.3.2 Pipe, 4-Inch through 12-Inch Diameter: Pipe, couplings, and fittings shall conform to the requirements of AWWA C900, Class 150, CIOD pipe dimensions, elastomeric gasket joint.
  - 2.4 Reinforced and Prestressed Concrete Pipe: Steel cylinder reinforced concrete pipe shall conform to AWWA C300, C301, or C303 and shall be designed to withstand a working pressure of not less than 150 psi, with bell and spigot steel joints and gaskets.
  - 2.5 Steel Pipe 3 Inches and Larger, not Galvanized: AWWA C200 with dimensional requirements as given in ANSI B36.10M for pipe 6 inches in diameter and larger, and ASTM A 53 for smaller sizes. Joints shall be mechanical, bell and spigot, or flanged. Pipe shall be coated with coal-tar primer followed by a hot coat of coal-tar enamel, a wrapper of asbestos felt impregnated with coal-tar, and a wrapper of Kraft paper or a coat of water-resistant white wash.
  - 2.6 Galvanized Steel Pipe, Less than 3 Inches: ASTM A 53, standard weight, screwed joints.
  - 2.7 Polyethylene Plastic (PE) Pipe Less than 3 Inches in Diameter: Pipe, tubing, and heat fusion fittings shall conform to AWWA C901.
  - 2.8 Polybutylene Plastic (PB) Pipe Less than 3 Inches in Diameter: Pipe, tubing, and fusion fittings shall conform to AWWA C902.
  - 2.9 Filament Wound Reinforced Thermosetting Resin Pipe (RTRP-I) for Lines 3 Inches and Larger: ASTM D 2996, normal working pressure of 150 psi at 73 F.
  - 2.10 Centrifugally Cast Reinforced Thermosetting Resin Pipe (RTRP-II) for Lines 3 Inches or Larger: ASTM D 2997.
  - 2.11 Reinforced Plastic Mortar Pressure (RPMP) Pipe for Lines 3 Inches or Larger: ASTM D 3517, bell and spigot type joints with elastomeric or mechanical gaskets.
  - 2.12 Filament Wound and Centrifugally Cast Reinforced Thermosetting Resin Pipe and Reinforced Plastic Mortar Pressure Pipe: Pipe shall have a quick burst strength equal to or greater than four times the normal working pressure of the pipe. The quick burst strength test shall conform to the requirements of ASTM D 1599. Joints shall be bell and spigot type with elastomeric gaskets.
  - 2.13 Valves:
    - 2.13.1 Check Valves shall be designed for a minimum working pressure of 150 psi. Valves 2 inches and smaller shall be all bronze with screwed fittings and shall conform to MSS SP-80, Class 150, Types 3 and 4. Valves larger than 2 inches shall be iron body, bronze-mounted with flanged ends, and non-slam type. Flanges shall be the 125-pound type conforming to ANSI B16.1.
    - 2.13.2 Gate Valves shall be designed for a working pressure of not less than 150 psi. Valves smaller than 3 inches shall be all bronze and shall conform to MSS SP-80, Type 1, Class 150. Valves 3 inches and larger shall be iron body, bronze-mounted, and shall conform to AWWA C500.
    - 2.13.3 Rubber-seated butterfly valves shall conform to the performance requirements of AWWA C504.
    - 2.13.4 Indicator post for valves shall conform to the requirements of NFPA No. 24.
  - 2.14 Fire Hydrants: AWWA C502 or C503.
  - 2.15 Fire Hydrant Hose Houses: NFPA No. 24.
  - 2.16 Disinfection Materials: Liquid chlorine conforming to AWWA B301 or calcium or sodium hypochlorite conforming to AWWA B300.
  - 3.0 EXECUTION:
    - 3.1 Installation:
      - 3.1.1 Water lines shall not be laid in the same trench with sewer lines, gas lines, fuel lines, or electric wiring.
      - 3.1.2 Copper tubing shall not be installed in the same trench with ferrous piping materials.
      - 3.1.3 Roads and Airfields: Pipe sleeve shall be rigid conduit and shall have a minimum clearance of at least 2 inches between the inner wall of the sleeve and the maximum outside diameter of the sleeved pipe and joints shall be provided.
      - 3.1.4 Structures: Where water pipe is required to be installed within three feet of existing structures, the water pipe shall be sleeved as required for roads, railroads, and airfields.

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- 3.2 Joint Deflection:
  - 3.2.1 Ductile Iron Pipe: The maximum allowable deflection will be as given in AWWA C600.
  - 3.2.2 Flexible Plastic Pipe: Maximum offset in alignment between adjacent pipe joints shall not exceed 5 degrees.
  - 3.2.3 Reinforced Concrete Pipe: Maximum allowable deflections from a straight line or grade, as required by vertical curves, horizontal curves, or offsets, will be 5 degrees.
  - 3.2.4 Steel Pipe: For pipe with bell and spigot rubber gasket joints, maximum allowable deflections from a straight line or grade, as required by vertical curves, horizontal curves, or offsets will be 5 degrees.
- 3.3 Placing and Laying:
  - 3.3.1 The following codes shall govern pipe installations: RTRP, ASTM D 3839; PE and PB, ASTM D 2774; PVC, AWWA M23.
  - 3.3.2 Pipe passing through walls of valve pits and structures shall be provided with cast-iron wall sleeves.
- 3.4 Service Lines: Service lines 2 inches and smaller shall be connected to the main by a directly tapped corporation stop or by a service clamp. A corporation stop and a copper gooseneck shall be provided with either type of connection. Service lines 1-1/2 inches and smaller shall have a service stop. Service lines 2 inches or larger shall have a gate valve.
- 3.5 Setting of Fire Hydrants: Each hydrant shall be connected to the main with a 6-inch branch line having at least as much cover as the distribution main. Not less than 7 cubic feet of free draining broken stone or gravel shall be placed around and beneath the waste opening of dry barrel hydrants to ensure drainage.
- 3.6 Thrust Blocks: Plugs, caps, tees, and bends deflecting 22-1/2 degrees or more, either vertically or horizontally, on waterlines 6 inches in diameter or larger, and fire hydrants shall be provided with thrust blocking or metal tie rods and clamps or lugs.
- 3.7 Hydrostatic Tests: The pipeline shall be subjected to both a pressure test and a leakage test.
  - 3.7.1 Pressure Test: After the pipe has been installed and the trench has been partially backfilled, leaving the joints exposed for examination, the pipe shall be filled with water in a manner to expel all air. The pipeline shall be subjected to a test pressure of 100 psi or 150 percent of the working pressure, whichever is greater, for a period of at least one hour.
  - 3.7.2 Leakage Test: A standard one-hour leakage test shall be performed subsequent to or concurrently with the pressure test and shall meet an allowable leakage rate

**Water Reservoirs and Tanks**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of elevated water tanks, ground level water tanks, and standpipes. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Standpipe, elevated steel water tank, or storage reservoir shall be in accordance with the applicable requirements of AWWA D100 and AWWA D102, except as modified herein.
  - 2.1 Bolts, Anchor Bolts, and Rods for Welded Steel Tanks: ASTM A 307; galvanizing shall conform to ASTM A 153.
  - 2.2 Reinforcing Steel: ASTM A 615, ASTM A 616, or ASTM A 617.
  - 2.3 Plates: ASTM A 36.
  - 2.4 Tubular Shapes: ASTM A 500, Grade B, for cold-formed; ASTM A 501 for hot-formed.
  - 2.5 Design Loads: The following loads shall be considered in the design of tank structures and foundations:
    - a. Dead Loads: The unit weights for steel shall be 490 pcf and 144 pcf for concrete.
    - b. Live Load: Live load shall be the weight of all liquid when the tank is filled to just overflowing.
    - c. Wind Load and Snow Load: The elevated tank shall be designed according to ANSI A58.1 for a wind speed of 100 mph and for a snow load of 25 psf.
- 3.0 EXECUTION:
  - 3.1 Foundations for the standpipe, reservoir, tank columns and riser, and for the valve chamber shall be constructed of concrete, reinforced where necessary, and designed in accordance with Section

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12 of AWWA D100 except as shown or specified herein. Footings shall be designed in accordance with ACI 318 and constructed in conformance with the applicable requirements of SECTION: CONCRETE. The foundation for the reservoir shall be composed of a concrete ring at base of reservoir with bed of gravel under bottom of reservoir. After concrete ring walls are constructed, the gravel fill shall be placed to thickness shown on plans. Well-graded gravel or crushed stone, not exceeding 2 inches in size with no more than 5 percent passing the No. 200 sieve, shall be placed and thoroughly tamped or rolled at a moisture content that will yield a maximum density for the type of compaction equipment used. The material shall have a crowned surface of 1 inch vertical to 10 feet horizontal as a minimum to allow for the settlement and to ensure that tank bottom will be approximately level.

- 3.2 Anchors: A sufficient number of anchors, designed to prevent overturning of the standpipe, reservoir, or elevated storage tank, when empty, shall be installed. The anchors shall be not less than 1-1/4 inches in diameter and shall be set deep enough to resist the computed uplift. The anchors shall be bent 90 degrees for anchorage in the concrete, or they shall be provided with anchor plates, which may be made of scrap plates or structural steel channels. The anchor bolts shall be attached to the cylinder or anchor plates by means of properly designed lugs made of structural steel shapes or bent plates. Factor of safety on overturning under design wind load shall be 1.33 minimum. An inverted truncated pyramid of earth with 2 on 1 side slopes above top of footing may be used in determining overturning stability.
- 3.3 Test of Valves and Piping: After the tank has been erected and the valves and piping installed and before field painting is begun, the valves and piping shall be subjected for 1 hour to a hydrostatic pressure test of 1.33 times the anticipated static pressure at the points of reading when the system is put into operation.
- 3.4 Disinfection: Comply with requirements of AWWA C652.

**Chilled Water Lines**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of chilled water lines. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Piping and Fitting for Chilled Water Lines:
    - 2.1.1 Pipes to 4 Inches: Steel, welded, Schedule 40, ASTM A 53.
    - 2.1.2 Pipes 6 to 16 Inches: Steel, seamless or ERW, standard weight, ASTM A 53.
    - 2.1.3 Fittings to 1-1/2 Inches: MI, 150-pound, ASTM A 197, screwed ends ANSI B16.3.
    - 2.1.4 Fittings 2 to 16 Inches: Steel, seamless, standard weight, ASTM A 234, butt weld ends, ANSI B16.9.
    - 2.1.5 Unions to 2 Inches: MI, 150-pound, ASTM A 197, screwed ends, brass-to-iron seats.
    - 2.1.6 Unions 2-1/2 to 16 Inches: Flanged.
    - 2.1.7 Flanges 16 Inches and Under: Steel, ASTM A 105 or A 181, 150-pound, slip-on or welding neck type, ANSI B16.5.
    - 2.1.8 Gaskets-Water Service: Red rubber sheet, 1/16 inch thick, ring or full face as required, ASTM D 2000.
    - 2.1.9 Gaskets-Air Service: Compressed asbestos, 1/16 inch thick, ring or full-faced as required, ASTM F 104.
  - 2.2 Shutoff Valves for Chilled Water Lines:
    - 2.2.1 Gate Valves: MSS SP-80. Size 1/4 to 2 inches shall be screwed ends with bronze body. Size 2-1/2 to 16 inches shall be flanged ends with cast-iron body.
    - 2.2.2 Butterfly Valves: AWWA C504. Size 3 to 16 inches, wafer-flanged ends with cast-iron body.
  - 2.3 Control Valves for Chilled Water Lines:
    - 2.3.1 Globe Valves: MSS SP-80. Size 1/4 to 2 inches shall be screwed ends with bronze body. Size 2-1/2 to 10 inches shall be flanged ends with cast-iron body.
    - 2.3.2 Angle Valve: MSS SP-80. Size 1/4 to 2 inches shall be screwed ends with brass body. Size 2-1/2 to

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- 14 inches shall be flanged ends with cast-iron body.
- 2.3.3 Butterfly Valve: AWWA C504. Size 3 to 16 inches shall be wafer-flanged with cast-iron body.
  - 2.4 Check Valves for Chilled Water Lines: Fed. Spec. WW-V-51. Swing valves shall be size 1/4 to 2 inches, screwed ends with bronze body or size 2-1/2 to 16 inches, flanged ends with bronze body.
  - 2.5 Preinsulated Pipe Materials:
    - 2.5.1 Foam Insulation: ASTM C 1029. Factory-applied polyurethane foam insulation shall completely fill the annular space between carrier pipe and jacket.
    - 2.5.2 Jacketing Material: Material shall be extruded white polyvinylchloride, conforming to ASTM D 1784.
    - 2.5.3 Joints shall be insulated with polyurethane foam, jacketed with PVC sleeves, and sealed with heat-shrinkable tape.
    - 2.5.4 Fittings shall be insulated with polyurethane foam and jacketed with PVC fittings.
  - 3.0 EXECUTION:
    - 3.1 Preparation: The trench bottom shall be stabilized by over excavating 6 inches and replaced by fine graded earth or sand. After pipe is assembled in place and prior to testing, a partial backfill shall be accomplished by tamping fine graded earth or sand around the pipe in 6-inch layers to a minimum of 6 inches above the jacket, leaving joints exposed for visual inspection during hydrostatic testing.
    - 3.2 Testing: The joints of the chilled water lines shall be exposed for visual inspection during hydrostatic testing. After testing is complete, joints shall be covered in a similar manner and backfill operation shall proceed.

**Well Repair**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of water wells. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Repair and replacement parts shall be clean, free of rust and scale, and of proper size and design for the specific well repair to be made.
- 3.0 EXECUTION:
  - 3.1 Cement grout may be hand mixed at the site.
  - 3.2 Level and re-sod area after heavy equipment has been used or if chemicals have been spilled.
  - 3.3 Abandoned wells shall be sealed in accordance with AWWA A100.
  - 3.4 Disinfect well, after repair, in accordance with AWWA A100.

**Water Wells**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for drilled and gravel packed water wells. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the American Water Works Association (AWWA) standards and the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Casings:
    - 2.1.1 Carbon Steel: ASTM A 53 and ASTM A 139.
    - 2.1.2 Stainless Steel: ASTM A 409.
    - 2.1.3 Plastic: ASTM F 480.
  - 2.2 Screens: Stainless Steel ASTM A 304.
  - 2.3 Gravel Packs: AWWA A100, Sections 6.3, 6.4, and 6.5.
  - 2.4 Sealing Grout: AWWA A100, Sections 7.2 and 7.3.
- 3.0 EXECUTION:
  - 3.1 General: Construction shall be in accordance with the latest edition of AWWA A100 in its entirety including appendices. The standard shall not only cover 8-inch drilled wells and gravel packed wells but the criteria shall also be applied to 4-inch to 6-inch diameter wells.
  - 3.2 Drilling: The method of drilling shall be approved by the Authorized Member Representative.

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- 3.3 Drilling Samples: Samples of formations shall be retained by the Contractor during drilling with full access by the Authorized Member Representative. Additional samples shall be taken as directed by the Authorized Member Representative. Drilling samples shall be delivered to the Member at the completion of the well installation as directed.
- 3.4 Reports: Geophysical logging and drillers log report shall be required as directed by the Authorized Member Representative.
- 3.5 Casing Size: Casing diameter and wall thickness shall be as determined by Tables 2 and 3 of AWWA A100 but in no case shall the wall thickness be less than 1/4 inch (or Schedule 40 for 4-inch pipe).
- 3.6 Screen Size: The screen diameter, length, and grid openings shall be as required by the aquifer but in no case shall the entrance velocity exceed 1.5 fps. Screen construction shall be approved by the Authorized Member Representative.
- 3.7 Constant Flow Rate: The Authorized Member Representative will determine the constant flow rate test level based on information from the step-drawdown tests considering the recommendation of the Contractor.

**Gas Distribution Lines**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of gas distribution lines. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Piping for Gas Distribution Lines: Piping shall be steel, Schedule 40, ASTM A 53 or polyethylene, ASTM D 1248 and ASTM D 2513. Pipe designations shall be PE 2306 and PE 3306, designated for gas distribution.
  - 2.2 Fittings for Steel Pipe:
    - 2.2.1 Threaded: Fed. Spec. WW-P-521, Type I, black.
    - 2.2.2 Welded: Butt-welded fittings shall conform to ANSI B16.9. Socket welded fittings shall conform to ANSI B16.11.
    - 2.2.3 Flanged: ANSI B16.5.
    - 2.2.4 Pipe Threads: ASME B1.20.1.
  - 2.3 Valves: Valves shall conform to Mil. Spec. MIL-V-12003, type I, 175 psig. In plastic lines, valves shall be so designed as to protect against excessive torsional or shearing loads.
  - 2.4 Protective Covering for Underground Steel Pipe: A coat of coal-tar primer, a coat of coal-tar enamel, a wrapper of coal-tar saturated felt, and a wrapper of Kraft paper or a coat of water-resistant whitewash shall be applied in accordance with the requirements of AWWA C203.
- 3.0 EXECUTION:
  - 3.1 Gas Lines: Plastic pipe shall not be installed above ground, in distribution systems that exceed 50 psig, or where operating temperatures of the materials will be below -20 F or above 100 F.
  - 3.2 Installation of gas lines shall be in conformance with ANSI B31.8 and, where applicable, IAPMO IS-10.
  - 3.3 Gas mains shall have a minimum cover of 24 inches, and service lines shall have a minimum cover of 18 inches.
  - 3.4 A single conductor No. 14 AWG Wire with type TW insulation shall be installed with plastic pipe to facilitate pipe locating.
  - 3.5 Tests: The distribution system of gas mains and gas service lines shall prove gas-tight by air test under a pressure of 75 psig or not less than 1-1/2 times the operating pressure, whichever is greater.
    - 3.5.1 Test of Gas Mains: The test shall continue for at least 24 hours from the time of the initial readings to the final readings of pressure and temperature. The initial test readings shall not be made for at least one hour after the pipe has been subjected to the full test pressure. The testing instruments shall be approved and subject to inspection at all times during the test.
    - 3.5.2 Test of Service Lines: Service lines shall be tested in accordance with ANSI B31.8.

**Foundation Drainage Systems**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of foundation drainage systems. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Clay Pipe: ASTM C 700.
  - 2.2 Perforated Clay Pipe: ASTM C 700.
  - 2.3 Concrete Pipe: ASTM C 14.
  - 2.4 Perforated Concrete Pipe: ASTM C 14 with perforations conforming to ASTM C 444.
  - 2.5 Porous Concrete Pipe: ASTM C 654.
  - 2.6 Clay Drain Tile: ASTM C 4.
  - 2.7 Perforated Clay Drain Tile: ASTM C 498.
  - 2.8 Concrete Drain Tile: ASTM C 412.
  - 2.9 Cast-Iron Soil Pipe: ASTM A 74.
  - 2.10 Perforated Corrugated Steel Pipe: ASTM A 760.
  - 2.11 Perforated Corrugated Aluminum Alloy Pipe: Fed. Spec. WW-P-402.
  - 2.12 Perforated Bituminized-Fiber Pipe: ASTM D 2311 or D 2417.
  - 2.13 Perforated Corrugated Polyethylene Drainage Tubing: Soil Conservation Service, Engineering Standard 606.
  - 2.14 Acrylonitrile-Butadiene-Styrene (ABS) Pipe: ASTM D 2751, with a maximum SDR of 35.
  - 2.15 Polyvinyl Chloride (PVC) Pipe: ASTM D 3034, with maximum SDR of 35, and with flexible elastomeric seal joint.
  - 2.16 Fittings: Fittings shall be of compatible materials for pipe.
  - 2.17 Cleanouts: Cleanout pipe and fittings and piping through walls and footings shall be cast-iron soil pipe. Each cleanout shall have a brass ferrule and cast-brass, screw-jointed plug with socket or raised head for wrench.
  - 2.18 Cover and Wrapping Materials for Open Joints in Drain Tile: Tar paper, roofing paper, reinforced building paper, glass fiber fabric, or other similar type material. Wrapping material shall be 18 x 14 mesh, 0.01-inch diameter nonferrous wire cloth.
- 3.0 EXECUTION:
  - 3.1 Trenches shall be kept dry during installation of drainage system. Changes in direction of drain lines shall be made with 1/8 bends. Wye fittings shall be used at intersections.
  - 3.2 Bedding: Graded bedding, minimum 6 inches in depth, shall be placed in the bottom of trench for its full width and length. Except for recesses for bell joints, the bedding shall fully support the lower quadrant of the pipe.
  - 3.3 Pipe Laying: Drain lines shall be laid to true grades and alignment with a continuous fall in the direction of flow. Bells of pipe sections shall face upgrade. Perforated pipe shall be laid with perforations facing down.
  - 3.4 Joints:
    - 3.4.1 Perforated and porous types of drain pipes shall be laid with closed joints.
    - 3.4.2 Non-perforated and plain-end drain tile shall be laid with 1/8-inch to 1/4-inch open joints. Open joints shall be covered or wrapped.
    - 3.4.3 Joints of concrete or clay sewer pipe shall be caulked with oakum and filled solid with cement mortar.
    - 3.4.4 Joints of cast-iron pipe or connections between cast-iron and porous concrete pipes shall be caulked with oakum gasket and filled with lead.
    - 3.4.5 Perforated bituminized-fiber pipe joints in which pipe ends and couplings are tapered shall have a tight-driven fit. Approved split-collar couplings may be used with square-end pipe.
    - 3.4.6 Plain-end perforated clay drain tile joints shall be made with spring-wire clips, coated with a rust preventive that will maintain a taut but elastic joint between sections when laid.
    - 3.4.7 Acrylonitrile-Butadiene-Styrene (ABS) Pipe shall be jointed using solvent cement or elastomeric joints.

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- 3.4.8 Polyvinyl Chloride (PVC) Pipe Joints shall be in accordance with ASTM D 3212.
- 3.5 Outlet Lines: The outlet end of drain lines connecting with an open gutter or outfall shall be covered with a removable wire basket of copper or bronze wire cloth.
- 3.6 Backfilling: After joints and connections have been inspected and approved, pervious backfill material shall be placed on each side of the pipe or tile and 12 inches above the top of the pipe as shown for the full width of the trench. A protective covering shall be placed over the pervious backfill for the full width of the trench before regular backfill is placed.
- 3.7 Cleanouts in unpaved areas shall be set in 12-inch by 12-inch by 4-inch concrete blocks.

**Underslab Drainage**

- 2.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of underslab drainage. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Concrete pipe shall conform to ASTM C 14.
  - 2.2 Clay pipe shall conform to ASTM C 700.
  - 2.3 Perforated clay pipe shall conform to ASTM C 700. Clips for plain-end pipe shall be constructed of not smaller than No. 9 hard-drawn or oil-tempered steel wire conforming to ASTM A 227 or A 229, and shall be coated with an approved rust preventive coating.
  - 2.4 Perforated concrete pipe shall conform to ASTM C 444 and to ASTM C 14.
  - 2.5 Perforated bituminized fiber pipe and couplings shall conform to ASTM D 2418.
  - 2.6 Perforated corrugated steel pipe shall conform to ASTM A 760.
  - 2.7 Perforated corrugated steel pipe, fully bituminous-coated shall conform to Fed. Spec. WW-P-405.
  - 2.8 Drain Tile: Clay drain tile shall conform to ASTM C 4. Concrete drain tile shall conform to ASTM C 412.
  - 2.9 Porous concrete pipe shall conform to ASTM C 654.
  - 2.10 Galvanized bituminous-coated, semicircular steel pipe shall conform to ASTM A 444. Bituminous coating shall be in accordance with Fed. Spec. WW-P-405.
  - 2.11 Perforated corrugated aluminum alloy pipe shall conform to Fed. Spec. WW-P-402.
  - 2.12 Perforated corrugated aluminum alloy pipe, fully bituminous-coated shall conform to Fed. Spec. WW-P-402.
  - 2.13 Precoated corrugated steel pipe shall conform to Fed. Spec. WW-P-405.
  - 2.14 Acrylonitrile-Butadiene-Styrene (ABS) Piping shall conform to ASTM D 2751.
  - 2.15 Polyvinyl Chloride (PVC) Pipe and Fittings shall conform to ASTM D 3034, Type PSM, with flexible elastomeric seal joint.
  - 2.16 Filter fabric shall be a pervious sheet of polyester, nylon, or polypropylene filaments woven or otherwise formed into a uniform pattern with distinct and measurable openings. The fabric shall be constructed so that the filaments will retain their relative position with respect to each other.
  - 2.17 Drainage Structures: Concrete shall have a minimum strength of 3,000 psi and an air content of 3 to 6 percent. Concrete cover over reinforcing shall be in conformance with ACI 318. Expansion joint filler material shall conform to ASTM D 1751 or D 1752. Mortar shall be composed by volume of one part Portland cement and two parts sand.
  - 2.18 Precast reinforced concrete manhole risers and tops shall conform to ASTM C 478.
  - 2.19 Precast concrete segmental blocks shall conform to ASTM C 139.
  - 2.20 Precast concrete manhole bases shall conform to ASTM C 478.
  - 2.21 Brick shall conform to ASTM C 62 or ASTM C 55.
  - 2.22 Prefabricated corrugated metal: steel manholes and risers shall be fabricated of galvanized and bituminous coated corrugated metal.
  - 2.23 Frames and covers or gratings shall be cast gray iron, ASTM A 48, Class 35B or ductile iron, ASTM A 536, Grade 65-45-12.
  - 2.24 Ladders or ladder rungs shall be fabricated of cast iron, wrought iron, or galvanized steel.
  - 2.25 Subdrain filter and bedding material shall be washed sand, sand and gravel, crushed stone,

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crushed stone screenings, or slag composed of hard, tough, durable particles free from adherent coatings.

3.0 EXECUTION:

- 3.1 Manholes shall be installed complete with frames, ladders, and covers or gratings.
- 3.2 Filter Fabric: One layer of filter fabric shall be wrapped around open joints and perforated or slotted collector pipes. Trenches to be lined with filter fabric shall be graded to obtain smooth side and bottom surfaces so that the fabric will not bridge cavities in the soil or be damaged by projecting rock.
- 3.3 Pipe laying: The laying of pipe shall proceed upgrade beginning at the lower end of the pipeline. Pipe shall not be laid in water. Pipe shall be bedded to the established grade line. Perforations shall be centered on the bottom of the pipe.
- 3.4 Jointing:
  - 3.4.1 Nonperforated Concrete and Clay Pipe: Pipe shall be laid with 1/8- to 1/4-inch openings between ends of pipe.
  - 3.4.2 Perforated Concrete and Clay Pipe: Pipe shall be laid with closed joints. Plain-end perforated clay pipe sections shall be fastened together with spring wire clips furnished by the pipe manufacturer.
  - 3.4.3 Perforated Bituminized-Fiber Pipe: Pipe shall be installed with either a tapered coupling or a split-collar coupling.
  - 3.4.4 Perforated Corrugated Metal Pipe, or Unpaved Bituminous-Coated, Perforated Corrugated Metal Pipe: The sections of pipe shall be securely fastened together with standard connecting bands furnished by the manufacturer of the pipe.
  - 3.4.5 Drain Tile: Drain tile shall be laid with open joints of approximately 1/8-inch width but not over 1/4-inch width.
  - 3.4.6 Porous Concrete Pipe: Pipe shall be installed with mortar joints.
  - 3.4.7 Bituminous-Coated or Uncoated Semicircular Steel Pipe: Coupling bands shall consist of uncorrugated top and bottom sections bolted together with four bolts.
  - 3.4.8 Bituminous-Coated or Uncoated Corrugated Aluminum Pipe: Use standard connecting bands furnished by the pipe manufacturer.
  - 3.4.9 Acrylonitrile-Butadiene-Styrene (ABS): Solvent cement or elastomeric joints for ABS pipe shall be in accordance with ASTM D 2751.
  - 3.4.10 Polyvinyl Chloride (PVC) Pipe: Joints shall be in accordance with the requirements of ASTM D 3212.
- 3.5 Backfilling: Filter material shall be placed around and over the pipe. The remainder of the trench shall be filled with overlying backfill material.

**Storm Drains**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of storm drains. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Reinforced Concrete Pipe: ASTM C 76 or AASHTO M 170.
  - 2.2 Reinforced Concrete Arch Culvert and Storm Drainpipe: ASTM C 506.
  - 2.3 Reinforced Concrete Elliptical Culvert and Storm Drainpipe: ASTM C 507.
  - 2.4 Nonreinforced Concrete Pipe: ASTM C 14 or AASHTO M 86, Class 1, Class 2, Class 3.
  - 2.5 Reinforced Concrete Box Sections: ACI 346.
  - 2.6 Clay Pipe: AASHTO M 65 or ASTM C 700.
  - 2.7 Corrugated Steel Pipe, Pipe Arch, and Couplings: Pipe and couplings shall conform to ASTM A 760.
  - 2.8 Structural-Plate Steel Pipe, Pipe Arches, and Arches: Plate and bolted assembly shall conform to Fed. Spec. WW-P-405.
  - 2.9 Corrugated Aluminum Alloy Pipe, Pipe Arch, and Underdrains: Pipe shall conform to Fed. Spec. WW-P-402.
  - 2.10 Structural-Plate Aluminum Pipe, Pipe Arches, and Arches: Plate and bolted assembly shall conform to Fed. Spec. WW-P-402.

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- 2.11 Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings: ASTM D 2751.
- 2.12 Reinforced Plastic Mortar (RPMP) Sewer Pipe: ASTM D 2992.
- 2.13 Precast Reinforced Concrete Manholes: ASTM C 478 or AASHTO M 199.
- 2.14 Reinforced Plastic Mortar (RPM) Manholes: ASTM D 3840.
- 2.15 Corrugated Polyethylene (PE) Plastic Manholes: ASTM D 3753.
- 2.16 Glass Fiber-Reinforced Polyester Manholes: ASTM D 3841.
- 2.17 Prefabricated Corrugated Metal Inlets and Manholes: Manholes and inlets shall be complete with frames and covers, or frames and gratings.
- 2.18 Manhole ladders or steps shall be fabricated of steel or heavy-duty aluminum, minimum 16 inches in width with 3/4-inch diameter or square rungs on 12-inch centers. Steel ladders and inserts shall be galvanized after fabrication.
- 2.19 Precast concrete segmental blocks shall conform to ASTM C 139, and shall be not more than 8 inches thick nor less than 8 inches long.
- 2.20 Brick shall conform to ASTM C 62, Grade SW; ASTM C 55, Grade S-I or S-II, or ASTM C 32, Grade MS. Brick structures shall be plastered with 1/2-inch of mortar over the entire outside surface of the walls.
- 2.21 Walls and headwalls shall be reinforced concrete, plain concrete, or steel sheeting as indicated.
- 2.22 Flared End Sections shall be a standard design with pipe manufacturer and manufactured of the same material as specified for the pipe.
- 2.23 Concrete for Structures: ACI 318.
- 2.24 Mortar shall be composed of Portland cement, Portland blast-furnace slag, Portland-pozzolan, or masonry cement, as available.
- 3.0 EXECUTION:
- 3.1 Excavation:
  - 3.1.1 Trenches: Except where banks are cut back on a stable slope, excavation for trenches shall be sheeted, braced, and shored as necessary for proper laying of pipe. Care shall be taken not to over excavate. Remove stones as necessary to avoid point bearing.
  - 3.1.2 Storm Sewers: The width of the trench at and below the top of the pipe shall be such that the clear space between the barrel of the pipe and the trench wall shall not exceed 8 inches on either side of the pipe. The width of the trench above that level shall be as wide as necessary for sheeting and bracing and the proper performance of the work.
  - 3.1.3 Appurtenances: Excavation for manholes and similar structures shall be sufficient to leave at least 12 inches in the clear between the outer surfaces and the embankment or timber that may be used to hold and protect the banks.
- 3.2 Backfilling:
  - 3.2.1 Trenches: Backfill trenches to finish grade with satisfactory materials. Replace pavement, base course, and compact sub grade disturbed by trenching operations in an acceptable manner with materials equal to the adjacent compacted sub grade, base course, and pavement for a minimum distance of 12 inches on each side of the trench and conform to the requirements hereinafter specified.
  - 3.2.2 Lower Portion of Trench: Deposit backfill material in 6-inch maximum thickness layers and compact with suitable tampers to the density of the adjacent soil until there is a cover of not less than 24 inches over lines, unless otherwise noted. The backfill material in this portion of the trench shall be free from stones larger than 3 inches in any dimension and hard clods and conglomerates larger than 6 inches in any dimension.
  - 3.2.3 Remainder of Trench: Except for special materials for pavements and railroads, backfill the remainder of the trench with material that is free of stones larger than 6 inches or 1/2 the layer thickness, whichever is smaller, in any dimension. Deposit backfill material in layers not exceeding the thickness specified.
- 3.3 Installation:
  - 3.3.1 General: Under no circumstances shall pipe be laid in water. No pipe shall be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary.
  - 3.3.2 Plastic Pipe and Manholes: Install plastic pipe and manholes in compliance with ASTM D 2321,

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ASTM D 3753, and ASTM D 3839.

- 3.3.3 Concrete and Clay Pipe: Laying shall proceed upgrade with spigot ends of bell and spigot pipe and tongue ends of tongue and groove pipe pointing in the direction of the flow.
- 3.3.4 Circular Concrete Pipe with Elliptical Reinforcing: Placement shall be such that reference lines designating top of pipes will not be more than 5 degrees from the vertical plane through the longitudinal axis of the pipe.
- 3.3.5 Corrugated Metal Pipe and Pipe Arch: Laying shall be with the separate sections joined firmly together with the outside laps of circumferential joints pointing upstream and with longitudinal laps on the sides. Suitable markings or properly placed lifting lugs shall be provided to ensure placement of factory elongated pipe in a vertical plane.
- 3.3.6 Structural-Plate Steel Pipe, Pipe Arches, and Arches: Tighten bolts on each section progressively and uniformly, starting at one end of the structure after all plates are in place. Repeat the operation to ensure that all bolts are tightened to meet the torque requirement of 200 foot-pounds, plus or minus 50 foot-pounds.
- 3.3.7 Structural-Plate Aluminum Pipe, Pipe Arches, and Arches: Tighten bolts on each plate progressively and uniformly, starting at one end of the structure after all plates are in place. Repeat the operation to ensure that all bolts are torqued to a minimum of 100 foot-pounds on aluminum alloy bolts and a minimum of 150 foot-pounds on galvanized steel bolts.
- 3.3.8 Manhole Ladders: Install manhole ladders when the manhole depth exceeds 12 feet. Anchor ladders adequately to the wall by means of steel inserts spaced not more than 6 feet apart vertically. Provide at least 6-1/2 inches of space between wall and inside of rungs.

**Force Drains and Inverted Siphons**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of force mains and inverted siphons. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Piping for force mains shall be ductile iron, steel, polyvinyl chloride (PVC) plastic, filament-wound reinforced or centrifugally cast reinforced thermosetting resin, thermo-setting reinforced plastic mortar pressure pipe, or reinforced concrete.
- 2.1 Ductile Iron Pipe: AWWA C151, 150 psi working pressure. Pipe shall be cement mortar-lined in accordance with AWWA C104. Joints shall conform to AWWA C111. Flanges shall conform to AWWA C115.
- 2.2 Polyvinyl chloride (PVC) Plastic Pipe: All pipe, couplings, and fittings shall be manufactured of material conforming to ASTM D 1784, Class 12454B, designated as PVC 1120 in ASTM D 1785.
- 2.3 Reinforced and Prestressed Concrete Pipe: Steel cylinder reinforced concrete pipe shall conform to AWWA C300, C301, or C303 and shall be designed to withstand a working pressure of not less than 150 psi, with bell and spigot steel joints and gaskets.
- 2.4 Steel Pipe 3 Inches and Larger, not Galvanized: AWWA C200 with dimensional requirements as given in ANSI B36.10 for pipe 6 inches in diameter and larger, and ASTM A 53 for smaller sizes. Joints shall be mechanical, bell and spigot, or flanged.
- 2.5 Filament Wound Reinforced Thermosetting Resin Pipe (RTRP-I) for Lines 3 Inches and Larger: Pipe shall conform to ASTM D 2996. The pipe shall be suitable for a normal working pressure of 150 psi at 73 F.
- 2.6 Centrifugally Cast Reinforced Thermosetting Resin Pipe (RTRP-II) for Lines 3 Inches or Larger: Pipe shall conform to ASTM D 2997.
- 2.7 Reinforced Plastic Mortar Pressure (RPMP) Pipe for Lines 3 Inches or Larger: Pipe shall conform to ASTM D 3517. Joints shall be bell and spigot type with elastomeric or mechanical gaskets.
- 2.8 Valves:
  - 2.8.1 Check Valves shall be designed for a minimum working pressure of 150 psi. Valves larger than 2 inches shall be iron body, bronze-mounted, shall have flanged ends, and shall be the non-slam type. Flanges shall be the 125-pound type conforming to ANSI B16.1.
  - 2.8.2 Gate Valves shall be designed for a working pressure of not less than 150 psi. Valves smaller than 3

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- inches shall be all bronze and shall conform to MSS SP-80, Type 1, Class 150. Valves 3 inches and larger shall be iron body, bronze-mounted, and shall conform to AWWA C500.
- 2.8.3 Rubber-Seated Butterfly Valves shall conform to the performance requirements of AWWA C504.
  - 2.8.4 Plug Valves: Cast-iron valves shall comply with MSS SP-78. Steel plug valves shall comply with API Spec. 6D.
  - 2.8.5 Pinch Valves shall be double-acting, jam-proof type with unobstructed streamlined flows and built-in operator. The valve shall have flanged ends. Flanges shall be of the 125-pound type complying with ANSI B16.1.
  - 2.8.6 Air Release Valves shall be attached by means of threaded pipe connections.
    - 2.8.6.1 Manual Air Release Valves shall consist of a 3-inch gate valve and 3-inch ductile iron pipe and fittings.
    - 2.8.6.2 Automatic Air Release Valves shall be of the compound lever type capable of withstanding operating pressures of 150 psi.
  - 2.9 Valve Boxes shall be cast iron or concrete. Only concrete boxes will be acceptable in roadways or in areas subject to heavy loads.
  - 2.10 Valve Vaults: Precast concrete units conforming to ASTM C 478.
  - 3.0 EXECUTION:
    - 3.1 Utility Separation: Pressure sewer pipe and water pipe shall be separated by at least 10 feet horizontally.
    - 3.2 Placing and Laying:
      - 3.2.1 RTRP Pipe shall be installed in accordance with ASTM D 3839. PVC shall be installed in accordance with AWWA M23.
      - 3.2.2 Pipe Passing Through Walls of valve pits and structures shall be provided with cast-iron wall sleeves.
    - 3.3 Thrust Blocks: Plugs, caps, tees, and bends deflecting 22-1/2 degrees or more, either vertically or horizontally, on waterlines 6 inches in diameter or larger, and fire hydrants shall be provided with thrust blocking or metal tie rods and clamps or lugs.
    - 3.4 Hydrostatic Tests: The pipeline shall be subjected to both a pressure test and a leakage test.
      - 3.4.1 Pressure Test: After the pipe has been installed and the trench has been partially backfilled, leaving the joints exposed for examination, the pipe shall be filled with water in a manner to expel all air. The pipeline shall be subjected to a test pressure of 100 psi or 150 percent of the working pressure, whichever is greater, for a period of at least one hour.
      - 3.4.2 Leakage Test: A standard one-hour leakage test shall be performed subsequent to or concurrently with the pressure test and shall meet an allowable leakage rate according to the following formula:  
 $L = NDP/K$ , where L equals the allowable leakage in gallons per hour, N is the number of field joints in the length of pipeline tested, D is the nominal diameter of the pipe in inches, P is the square root of the average test pressure in psig, and K is equal to 7,400.

**Sand Drains**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of sand drains. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Galvanized Perforated Corrugated Metal Pipe: AASHTO M36.
  - 2.2 Perforated Polyvinyl Chloride (PVC) Plastic Pipe: ASTM D 1784.
  - 2.3 Aggregate shall be sand, gravel, crushed rock, or chat that is clean, sound, and of a good quality. Gradation shall conform to the following table:

Retained on the 1-inch sieve	0%
Retained on the 3/8-inch sieve	0-15%
Retained on the No. 8 sieve	40-60%
Retained on the No. 30 sieve	70-95%
Retained on the No. 100 sieve	98-100%
- 3.0 EXECUTION:

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- 3.1 Pipe Bedding: Aggregate shall be placed in uniform layers on level excavation.
- 3.2 Perforated Pipe shall be laid with securely aligned joints to lines and grades, which will allow proper drainage.
- 3.3 Perforated Pipe shall be embedded with a minimum coverage of two feet of aggregate or as directed.

**Wastewater Collection**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of wastewater collection systems. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Bituminized Fiber Pipe and Fittings: ASTM D 1861, except that wye branches and tees may be vitrified clay, concrete, or cast iron.
  - 2.2 Cast-Iron Soil Pipe and Fittings: ASTM A 74, Class SV or XH. Acid-resistant lines shall be Class XH and contain not less than 12 percent silicon.
    - 2.2.1 Rubber Gaskets for Compression Joints: ASTM C 564.
    - 2.2.2 Caulked Joints: Joint packing material shall be twisted jute or oakum, tarred type. Lead shall comply with Fed. Spec. QQ-C-40.
  - 2.3 Clay Pipe and Fittings: Clay Pipe and Fittings shall conform to ASTM C 700. Compression Joints shall conform to ASTM C 425.
  - 2.4 Concrete Pipe: 24 inches in diameter or less, nonreinforced, ASTM C 14, Class 1; greater than 24 inches in diameter, reinforced, ASTM C 76.
    - 2.4.1 Joints less than 36 inches in diameter shall be bell and spigot type; pipe 36 inches or greater in diameter shall be bell and spigot type, tongue and groove type, or modified tongue and groove type. Joints and gaskets shall conform to ASTM C 443.
    - 2.4.2 Portland cement for Concrete Pipe and Fittings: ASTM C 150, Type IIA or V.
  - 2.5 Plastic Pipe: Plastic pipe shall not be used for sewers larger than 15 inches in diameter.
    - 2.5.1 Acrylonitrile-Butadiene-Styrene (ABS) Composite Piping: ASTM D 2680, Type SC or Type OR, size 8 inches through 15 inches in diameter.
    - 2.5.2 Acrylonitrile-Butadiene-Styrene (ABS) Pipe and Fittings: ASTM D 2751, solvent weld or bell and spigot O-ring joint, size 12 inches or less in diameter.
    - 2.5.3 Polyvinyl Chloride (PVC) Pipe and Fittings: ASTM D 3034, Type PSM with a maximum SDR of 35, size 15 inches or less in diameter, with flexible elastomeric seal joint, elastomeric gasket joint in accordance with ASTM D 3212.
    - 2.5.4 Branch Connections: Branch connections shall be made by use of regular fittings or solvent cemented saddles. Saddles for acrylonitrile-butadiene-styrene (ABS) composite pipe shall comply with Figure 2 of ASTM D 2680, saddles for acrylonitrile-butadiene-styrene (ABS) pipe shall comply with Table 3 of ASTM D 2751, and saddles for polyvinyl chloride (PVC) pipe shall comply with Table 4 of ASTM D 3034.
  - 2.6 Clay Pipe: Standard strength pipe shall conform to AASHTO M 65. Extra strength pipe shall conform to AASHTO M 65 or ASTM C 700. Compression fittings shall comply with ASTM C 425.
  - 2.7 Reinforced Plastic Mortar Pipe: ASTM D 3262. Fittings shall be in accordance with ASTM D 3840. Joints shall be bell and spigot type utilizing an elastomeric gasket.
  - 2.8 Brick for Manholes: ASTM C 62, Grade SW, or ASTM C 32, Grade MS.
  - 2.9 Cement Mortar: ASTM C 270, Type M. Use Type IIA cement.
  - 2.10 Concrete Blocks for Manholes: ASTM C 139.
  - 2.11 Portland cement: ASTM C 150, Type IIA or V.
  - 2.12 Concrete: ASTM C 94, compressive strength of 4,000 psi.
  - 2.13 Precast Reinforced Concrete Manhole Sections: ASTM C 478.
- 3.0 EXECUTION:
  - 3.1 Adjacent Facilities: Unless otherwise dimensioned, the sewer shall not be closer horizontally than ten feet to a water-supply main or service line, except that where the bottom of the water pipe will

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be at least twelve inches above the top of the sewer pipe, the horizontal spacing may be a minimum of six feet. Where gravity-flow sewers cross above water lines, the sewer pipe for a distance of ten feet on each side of the crossing shall be fully encased in 4 inches of concrete or shall be acceptable pressure pipe with no joint closer horizontally than three feet to the crossing.

- 3.1.1 Roads, Railroads, and Airfields: Sewer pipe shall be suitably encased in a sleeve of rigid conduit under primary access road crossings, railroad crossings, and at airfield runways and taxiways where aircraft are moved under their own power.
- 3.1.2 Structures: Where sewer pipe is required to be installed within three feet of an existing building or structural foundation, the sewer pipe shall be sleeved.
- 3.2 Pipe Laying: Pipe laying shall proceed upgrade with the spigot ends of bell and spigot pipe and tongue ends of tongue and groove pipe pointing in the direction of the flow.
- 3.3 Leakage Tests: Lines shall be tested for leakage by either infiltration tests or exfiltration tests, as appropriate. Leakage shall not exceed 0.2 gallons per inch diameter per 100 feet of pipeline per hour.
- 3.4 Test for Deflection: When flexible pipe is used, a deflection test shall be made on the entire length of the installed pipeline upon completion of all work, including the leakage test, backfill, and placement of any fill, grading, paving, concrete, or superimposed loads.
- 3.5 Building Connections shall include the lines to and connection with the building waste drainage piping at a point approximately 5 feet outside the building.

**Erosion Control**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of mesh or netting for erosion control. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Jute Mesh: Fed. Spec. CCC-C-467.
  - 2.2 Plastic Mesh: Manufacturer's recommendation.
  - 2.3 Plastic Netting: Manufacturer's recommendation.
  - 2.4 Polypropylene Mesh: Manufacturer's recommendation.
- 3.0 EXECUTION:
  - 3.1 Preparation: Grade, compact, fertilize, and seed the area to be protected.
  - 3.2 Installation: Apply blankets either horizontally or vertically to the slope. In ditches, apply blanket in direction of water flow. Lap and anchor blankets according to the manufacturer's instructions.

**Sewer Line Manholes**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of sewer line manholes. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 General: All materials shall be clean, free of defects, corrosion, and damage. All items shall be of proper type, size, design, and characteristics for the use intended. Unless otherwise specified, all items shall be factory made.
  - 2.2 Manhole Brick: Bricks used in the repair of manholes shall comply with ASTM C 32, Grade MS.
  - 2.3 Concrete used in the repair of manholes shall comply with ASTM C 94 with compressive strength of 3,000 psi.
  - 2.4 Portland cement shall comply with ASTM C 150, Type 5.
  - 2.5 Concrete Blocks for manhole repair shall comply with ASTM C 139, of the size required to match prevailing conditions.
  - 2.6 Cement Mortar shall comply with ASTM C 270, Type M.
  - 2.7 Precast Concrete Sections for manhole repair shall comply with ASTM C 478, utilizing Portland cement.
  - 2.8 Manhole Steps shall be of cast iron construction in compliance with ASTM A 48, Class 20-B or ASTM

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- A 536, with a minimum tensile strength of 35,000 psi.
- 2.9 Grout shall be of Portland cement, metallic or nonmetallic, nonshrink or expansive type, complying with ASTM C 476 or ASTM C 658.
  - 2.10 Epoxy Mortar shall be utilized to fill all deteriorated joints of brick manholes.
  - 2.11 Castings shall be gray iron, complying with ASTM A 48, Class 20B, or ductile iron, complying with ASTM A 536.
  - 2.12 Frames and Covers shall be for light-duty traffic, with 24-inch entrance diameter, anchored to the manhole structure.
    - 2.12.1 Waterproof Frame and Cover shall be gasket sealed with bolts for lid and shall comply with "Frames and Covers," above. Bolts and nuts shall be steel.
    - 2.12.2 Replacement Covers shall be solid, flat top, of the proper design and load rating, and fit the existing frame without need for adapters or additional hardware.
    - 2.12.3 Cover Height Adjustment Devices shall be expandable to fit the frame rim size and adjustable vertically to match the required finished grade elevation.
  - 3.0 EXECUTION:
    - 3.1 Preparation:
      - 3.1.1 Cleaning Existing Surfaces: Prior to applying grout, scrape surfaces of all loose material, dry of excess water, and clean of organics, slimes, or dust.
      - 3.1.2 Manhole Crack Preparation: Drill holes in cracks at the extreme ends and at 6- to 9-inch intervals with a masonry bit.
    - 3.2 Installation:
      - 3.2.1 Grouting, Interior of Manhole: Grout and seal interior wall of manhole by hand application, giving a trowel finish.
      - 3.2.2 Grouting, Exterior of Manhole: If pressure grouting from ground surface, insert applicator directly above area to be grouted and inject grout until grout enters manhole through crack. If pressure grouting from inside manhole, insert grout applicator at each drilled hole along the crack and repeatedly pump until grout emerges through the crack and annular space between hole and applicator.
      - 3.2.3 Curing of Grout: Cure Portland cement grout in a damp atmosphere by closing all entrances to the manhole.

**Sewer Line Grouting**

- 1.0 DESCRIPTION OF WORK: This specification covers sewer line grouting. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Grout shall be applicable to sewer conditions and as required to seal the pipe from leaks. Type of grout used shall be compatible with the soil and moisture conditions and shall provide watertight seals under all internal and external conditions to which the sewer shall be subjected.
  - 2.2 Chemical Grout shall be acrylamide gel or polyurethane foam.
    - 2.2.1 Acrylamide Gel shall be an aqueous solution of acrylamide and N,N' methylenebisacrylamide powders, with the proper catalyst, such as B-dimethylaminopropionitrile and ammonium persulfate, mixed in the proper proportions and concentrations to achieve the desired results, depending on the field conditions.
    - 2.2.2 Polyurethane Foam Grout shall be an aqueous solution of liquid urethane polymer, with a water-soluble amine accelerator.
  - 2.3 Epoxy Mortar Grout shall comply with ANSI A118.3.
  - 2.4 Portland cement Grout shall comply with ASTM C 476.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Alternate Sewage Discharge shall be provided to a downstream manhole.
    - 3.1.2 Preparatory Cleaning: Prior to beginning of grouting work, sewers to be repaired shall be cleaned of all debris, sediments, and tuberculation.
  - 3.2 Installation:

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- 3.2.1 Grouting shall take place at all joints determined to require repair and at cracks and crevices where infiltration or exfiltration is occurring or has a possibility of occurring.
- 3.2.2 Grouting of Lateral Connections and Manhole External Drops shall consist of pumping grout to fill the entire length of the lateral pipe and manhole drops until the grout exfiltrates through the various leaks. Allowing for proper grout setting time, ream the grouted pipe of excess grout in its entirety. Remove all excess grout without being discharged in the main sewer and dispose of properly.
- 3.2.3 Manual Grout Application: Grout large sewers allowing the physical entrance of personnel utilizing probe-type applications and injecting the grout material directly in the leaks or through holes drilled at the leaks. Grouting shall continue until all leaks are stopped.
- 3.2.4 Testing of Grouted Sewers:
  - 3.2.4.1 Air Testing of each individual joint and crevice shall be conducted upon setting of the in-place grout. The test shall be for not less than 30 seconds at each location, at pressures greater than or equal to the hydrostatic head caused by the maximum expected groundwater elevation. Record pressures at each location at five second intervals with an accuracy of 0.05 psi. Repair locations having pressure drops due to air leaks using grout or another approved method, until all leaks are stopped. Retest location after repairs are made.
  - 3.2.4.2 Hydrostatic Testing:
    - 3.2.4.2.1 Upon completion of grouting a section of sewer, the line shall be hydrostatically tested for leaks. Repair leaks using grout or another approved method, until all leaks are stopped. Retest line section after repairs are made.
    - 3.2.4.2.2 Infiltration and Exfiltration Leakage into or out of the sewer shall not exceed the equivalent of 100 gallons per day, per inch of diameter, per mile of sewer from any section between successive manholes. The infiltration test may be used when the ground water is at least 2 feet higher than the pipe crown. Measure leakage with a weir. The exfiltration test shall consist of plugging successive upstream manholes and service connections and filling of line from the upstream manhole with water to a depth of 2 feet or more above the pipe crown or the ground water, whichever is higher.
  - 3.2.4.3 Pneumatic Testing: Upon completion of grouting a section of sewers, the line shall be pneumatically tested for leaks in compliance with ASTM C 828. Repair leaks using grout or another approved method, until all leaks are stopped. Retest line section after repairs are made.
- 3.2.5 Performance of Grouted Sewers: Grouted sewer lines shall have no more than 100 gallons per inch diameter per mile of sewer per day, infiltration or exfiltration, upon completion of the work. Regrout sections of sewers experiencing more than the allowable leakage or otherwise repair by approved methods.

**Sewer Line Cleaning**

- 1.0 DESCRIPTION OF WORK: This specification covers sewer line cleaning. Cleaning procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: All materials shall be clean, free of defects, corrosion, and damage. All items shall be of proper type, size, design, and characteristics for the use intended. Unless otherwise specified, all items shall be factory-made.
  - 2.1 Portable Cleaning Equipment: Equipment used in the cleaning of sewer lines shall be as required to complete the work for the size, length, and conditions of the sewer. Portable and mobile equipment shall comply with Water Pollution Control Federation Manual of Practice No. 7.
  - 2.2 Chemicals shall be of the strength required to perform the work. The chemicals shall not be damaging to pipe materials, manholes, pumping equipment, nor treatment process and shall not be contaminated by foreign substances.
- 3.0 EXECUTION:
  - 3.1 Preparation:
    - 3.1.1 Protection required to prevent damage to adjacent materials, equipment, fixtures, and finishes shall be provided. Necessary protective clothing and accessories for personnel working with chemicals shall be provided.

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- 3.1.2 Ventilation of Sewers: Contractor shall provide proper ventilation for personnel working in the sewer.
- 3.1.3 Alternate Sewage Discharge: Contractor shall provide an alternate routing of sewage discharge to a downstream manhole.
- 3.1.4 Traffic: Contractor shall provide all traffic signs required to safely direct traffic at and around work areas.
- 3.2 Installation:
  - 3.2.1 Direction of Work: Sewer line cleaning work, with the exception of hydraulic scouring, shall proceed in the downstream direction. Cleaning by hydraulic scouring shall proceed in the upstream direction.
  - 3.2.2 Testing: Upon completion of cleaning operation, test sewer lines for proper operation and observe for a period of 24 hours. Clean out all stoppages and the retest the line for proper operation.

**Septic Tanks and Grease Traps**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of septic tanks and grease traps. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS: Concrete Repair Material shall be epoxy type grout in compliance with Applicable standards and/or.
- 3.0 EXECUTION:
  - 3.1 Septic Tanks and Grease Traps shall be drained and cleaned.
  - 3.2 Adequate Ventilation shall be provided and precautions against the presence of explosive vapors shall be taken if it is necessary to enter the septic tank.
  - 3.3 Soil Absorption System: Remove and dispose of vegetation roots impeding the flow of water in the soil absorption system properly. Restore all noticeable irregularities in the ground surface, caused by removal, by filling with soil that matches surrounding soil.
  - 3.4 Filling Abandoned Septic Tanks and Grease Traps: Clean and fill abandoned septic tanks and grease traps with compacted soil.

**Siphon Tank and Siphons**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for the repair and maintenance of sewage treatment plant dosing siphon tanks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Tank Repair Material shall be epoxy type grout complying with Applicable standards and/or.
  - 2.2 Concrete Coatings:
    - 2.2.1 Outside and Above Grade shall be epoxy type in compliance with Mil. Spec. MIL-P-24441.
    - 2.2.2 Inside and Below Grade shall be Coal-tar epoxy type in compliance with SSPC-PAINT 16.
  - 2.3 Steel Repair Material shall be steel plate or epoxy cement and fiberglass cloth.
  - 2.4 Corroded or Defective Siphons: Replace those parts corroded or defective with new parts compatible with the unit, as recommended by the manufacturer.
  - 2.5 Steel Coatings:
    - 2.5.1 Red-Lead Base Coat shall comply with Fed. Spec. TT-P-86, Type I.
    - 2.5.2 Aluminum Paint shall comply with Fed. Spec. TT-P-38.
- 3.0 EXECUTION:
  - 3.1 Corroded or Broken Pipe and Fittings: Replace as required.
  - 3.2 Minor Leaks: Repair minor leaks in the tank using material and surface preparation and application methods recommended by the material manufacturer.
  - 3.3 Spalled Areas: Repair as required.
  - 3.4 Cleaning and Coating:

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- 3.4.1 Interior Concrete Surfaces of the tank shall be cleaned with high pressure water or steam to remove all dirt and residue, allowed to dry, and brush sandblasted in compliance with SSPC-SP 7.
- 3.4.2 The exterior concrete surfaces of the tank shall be cleaned by means of brush sandblasting in compliance with SSPC-SP 7. The surfaces shall be blown down with air to remove the blasting residue and dust, and two coats of epoxy-polyamide paint shall be applied.
- 3.4.3 Holes and voids in the concrete surfaces left from the blast cleaning shall be filled by means of troweling and squeeze application of an epoxy filler. The surfacing material shall be allowed to cure overnight, and then two coats of Coal-tar epoxy complying with SSPC-PAINT 16 shall be applied.
- 3.4.4 Submerged ferrous metal surfaces that are exposed to the sewage shall be sandblasted in compliance with SSPC-SP 10 and coated with two coats of coal-tar epoxy.
- 3.4.5 Ferrous metal surfaces that are not submerged shall be cleaned by means of sandblasting in compliance with SSPC-SP 6. Surfaces inaccessible to sandblasting shall be power tool cleaned in compliance with SSPC-SP 3. Surfaces shall be coated with one coat of red-lead base paint. After the base paint has dried sufficiently, two coats of Aluminum finish paint shall be applied.

**Grease Interceptors**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of grease interceptors. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Semi-Automatic Grease Draw-Off: Unit shall be on-floor type, cast iron, porcelain, or painted inside and out, with internal air relief, grease draw-off piping, and valve with flow control fitting. Draw-off piping and nozzle may be interchanged in field to make unit a right- or left-handed installation. Unit shall also have double wall trap with removable baffles and gasketed cover with low pressure chamber. The pipe size of the influent line shall be based on the influent flow rate and grease capacity.
  - 2.2 Manual Grease Draw-Off: Unit shall be on-floor type, partially recessed or flush-with-floor type, cast iron, porcelain, or painted inside and out, with internal air relief and flow control fitting. Unit shall have double wall trap, removable baffles, gasketed cover bearing plumbing, and drainage seal of approval. The pipe size of the influent line shall be based on the influent flow rate and grease capacity.
  - 2.3 Manual Grease Draw-Off, Coated Steel Type: Unit shall be high volume on floor or partially recessed, with internal air relief, double wall trap, removable baffles, gasketed non-skid cover, and flow control fitting. The pipe size of the influent line shall be based on the influent flow rate and grease capacity.
- 3.0 EXECUTION: The unit shall be placed in the influent line of the waste water disposal and treatment system.

**Imhoff Tanks**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of sewage treatment plant Imhoff tanks. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Coatings:
    - 2.1.1 Epoxy-Filler Compound for concrete surfaces shall comply with Applicable standards and/or.
    - 2.1.2 Coal-tar epoxy shall comply with SSPC-PAINT 16.
    - 2.1.3 Epoxy paint shall comply with Mil. Spec. MIL-P-24441.
    - 2.1.4 Red-lead base paint shall comply with Fed. Spec. TT-P-86, Type I.
    - 2.1.5 Aluminum finish paint shall comply with Fed. Spec. TT-P-38.
  - 2.2 Steel Tank Repair Material for minor leaks shall be a two-component epoxy sealing compound. For

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- badly corroded areas, a steel plate of the same composition and thickness as the original tank shall be used.
- 2.3 Pipe and Fittings for replacement shall be equivalent to the existing pipe and fittings.
  - 3.0 EXECUTION:
    - 3.1 Preparation: Drain the contents of the tank and dispose of the sludge and sewage.
    - 3.2 Leak Repair:
      - 3.2.1 Concrete Tanks: Repair concrete tank leaks by cleaning and chipping or sandblasting the area of the leak and applying two-component epoxy concrete sealant.
      - 3.2.2 Steel Tanks: Repair steel tank leaks by cleaning, scraping, chipping, or sandblasting the area of the leak and applying epoxy steel sealant. Repair badly corroded areas of steel tanks by cutting out the corroded area and welding a section of new steel plate in place. Welding shall be in compliance with AWS D1.1.
    - 3.3 Pipe and Fittings: Replace pipe and fittings as required.
    - 3.4 Cleaning and Coatings:
      - 3.4.1 Interior Concrete Surfaces of the tank shall be cleaned with high pressure water or steam to remove dirt and residue, allowed to dry, and brush sandblasted.
      - 3.4.2 Holes and voids in the concrete surfaces left from the blast cleaning shall be filled by means of troweling and squeeze application of epoxy filler. Two coats of Coal-tar epoxy shall be applied to the surface after the epoxy has cured.
      - 3.4.3 Submerged ferrous metal surfaces such as piping and equipment that are exposed to the sewage shall be sandblasted and coated with two coats of coal-tar epoxy.
      - 3.4.4 Exterior Concrete Surfaces of the tank shall be cleaned by means of brush sandblast. The surfaces shall be blown down with air to remove the blasting residue and dust, and two coats of epoxy-polyamide paint shall be applied.
      - 3.4.5 Ferrous metal surfaces that are not submerged shall be cleaned by means of sandblasting. Coat surfaces with one coat of red-lead base paint. After the base paint has dried sufficiently, apply two coats of Aluminum finish paint.

**Sewer Line Pipe Lining**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of sewer line pipe lining. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Lining Material:
    - 2.1.1 Polyethylene Pipe: Extruded, flexible industrial grade, high density (Type 3 or 4) in 40 foot lengths, complying with ASTM D 2239 and D 2447.
      - 2.1.1.1 Diameter: Outside diameter shall be as large as possible while allowing for ease of pulling into the existing sewers. Pipe dimensions shall comply with ASTM D 2447 and D 2837.
      - 2.1.1.2 Liner Thickness and Class shall be suitable for the use intended. The tolerance on the pipe wall thickness shall be as noted in Table 2 of ASTM D 2447.
      - 2.1.1.3 Gravity Sanitary, Gravity Storm, and Gravity Industrial Sewers shall be Schedule 40.
      - 2.1.1.4 Gravity Thermal Discharge Sewers shall be Schedule 80.
      - 2.1.1.5 Low Pressure Sewers shall be Schedule 40, complying with ASTM D 2239.
      - 2.1.1.6 High Pressure Sewers shall be Schedule 80, complying with ASTM D 2239 and D 2837.
      - 2.1.1.7 Chemical Resistance: Pipe liner shall be resistant to chemical attack, erosion, and corrosion.
      - 2.1.1.8 Fittings shall be fabricated from polyethylene pipe. The polyethylene fittings shall have the same pressure rating as the pipe and shall comply with ASTM D 3261.
    - 2.1.2 Cement-Mortar Lining:
      - 2.1.2.1 Portland cement shall comply with ASTM C 150, Type 1.
      - 2.1.2.2 Pozzolan Cement shall comply with ASTM C 618 and shall not comprise more than 20 percent of total cement amount, by weight.
      - 2.1.2.3 Sand shall be well graded, clean, free from organic and extraneous matter. One hundred percent

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shall pass the 16-mesh size screen.

2.1.2.4 Lining Thickness: Cement lining shall be not less than 1/8 inch for pipe sizes 4 to 14 inches, not less than 3/16 inch for pipe sized 16 inches and larger, and not less than 1/4 inch for steel pipe 16 inches and larger.

2.1.3 Reinforced Mortar Pipe Slip-Lining:

2.1.3.1 Gravity Sewers: Slip-lining shall be of glass fiber reinforced polyester mortar pipe, complying with ASTM D 3262.

2.1.3.2 Pressure Sewers (Force Mains): Slip-lining shall be of glass fiber reinforced polyester mortar pipe complying with ASTM D 2517.

2.1.3.3 Diameter: Outside diameter shall be as large as possible while allowing for ease of pulling into existing sewers, as recommended by the manufacturer.

2.1.3.4 Chemical Resistance: Pipe liner shall be resistant to chemical attack, erosion, and corrosion.

2.1.3.5 Fittings: Fittings shall be manufactured of the same materials as is the glass fiber reinforced polyester mortar pipe.

2.1.4 Epoxy-Mortar Lining:

2.1.4.1 Epoxy Compound shall comply with ASTM D 1763.

2.1.4.2 Admixtures shall be well graded with one hundred percent passing the 16-mesh size screen. All admixtures shall improve the workability, density, and strength of the mortar.

2.1.4.3 Lining Thickness: For pipe sizes 4 to 14 inches, epoxy mortar lining thickness shall be not less than 1/8 inch. For pipe sizes 16 inches and larger, epoxy mortar lining shall be not less than 3/16 inch.

2.2 Joint:

2.2.1 Slip-Lining:

2.2.1.1 Polyethylene Pipe Butt Joints: Pipe lengths, fittings, and flanged connections to be joined by thermal butt fusion shall be of the same type, grade, and class of polyethylene compound and supplied by pipe supplier.

2.2.1.2 Flanged Joints shall consist of a polyethylene flange, thermally butt fused to the ends of the pipe. The companion flange shall be steel or cast iron and nylon-coated.

2.2.1.3 Lateral Service Connections: Sidewall connections shall be made with polyethylene pipe sections of the same material, grade, and class as the liner material and shall have the same pressure ratings. Lateral connections shall be watertight.

2.2.2 Reinforced Mortar Lining:

2.2.2.1 Bell and spigot joints shall be the inverted type.

2.2.2.2 Manhole Joints and Connections shall be oakum ring and grout as required.

3.0 EXECUTION:

3.1 Slip-Lining, Polyethylene Pipe:

3.1.1 Insertion of Liner: Liner shall be laid at a constant line and grade as the existing pipe, without undulations or damage. Where the existing pipe is not at constant grade, the liner shall follow as true a constant grade as possible.

3.1.2 Grouting: At manholes, annular space shall be packed with oakum and expansion grout or nonshrink grout as required. At existing line, after liner has been inserted, grout wherever existing pipe has failed structurally.

3.1.3 Concrete Encasement: Crown of liner shall be encased in concrete a minimum thickness of 6 inches for the entire length of the excavated trench and out at least 6 inches each side of the bottom half of the original pipe remaining down to firm soil. Wherever existing concrete encasement has been removed, the liner shall be encased in the same manner as the original pipe.

3.1.4 Thrust Blocks: Concrete thrust blocks shall be provided as required.

3.2 Cement Mortar and Epoxy Mortar Lining:

3.2.1 Cement Mortar Mixing: One part cement to one and one-half parts of sand by volume.

3.2.2 Application of Lining: The lining shall be applied to produce a smooth, uniform thickness throughout the interior of the pipe line.

3.2.3 Curing of the Cement Mortar Lining: Immediately upon completion of the lining of a length of pipe between access openings or at the end of a day's run, the section of pipe shall be closed at each end, the access openings covered to prevent the circulation of air, and the atmosphere kept moist.

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- 3.2.4 Reconnection of Pipes After Lining: Close and make watertight all openings in the sewer lines.
- 3.2.5 Pressure Test and Leaks: Hydrostatic and leakage test shall be conducted on all pipe that is cleaned and lined.
- 3.3 Reinforced Mortar Pipe Lining:
  - 3.3.1 Joining of Pipe Ends: Liner sections containing bell and spigot joints shall be joined using an O-ring.
  - 3.3.2 Grouting Work shall be accomplished following the same techniques as described in paragraph Slip-Lining, Polyethylene Pipe.
- 3.4 Cement Mortar Lining:
  - 3.4.1 Epoxy Mortar Lining: Excessive mortar shall be removed from the manhole walls and bottom. Manhole bottom shall receive special care in making all transitions smooth.
  - 3.4.2 Work at Service Connections: Plugs or caps shall be placed at the access point of the service connection to the sewer and shall be removed once the mortar has set. The completed lining shall not be damaged.
- 3.5 Reinforced Mortar Pipe Lining: Joining of fiberglass reinforced polyester mortar pipe shall be carried out in the trench, with the first section of liner already inserted.
- 3.6 Lateral Connections: Service to connections shall be provided for and continued after installation of the lining.
- 3.7 Testing: Upon completion of lining operation, the sewer line shall be tested for proper operation and shall be observed for a period of 24 hours. All deficiencies shall be corrected.
- 3.8 Pavement Restoration: All disturbed pavement shall be restored to its original condition and shall match existing adjacent.
- 3.9 Inspection: Large diameter sewers shall be inspected from inside to ensure that all lateral connections and joints are in proper order. Sewers that have been cement-lined may be inspected for a smooth finish, while plugs and caps are being removed.

**Sewage Treatment Lagoons**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for the repair and maintenance of sewage treatment lagoons. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Concrete Block shall comply with ASTM C 129.
  - 2.2 Concrete Grout shall comply with Applicable standards and/or.
  - 2.3 Riprap Stone shall comply with AREA-01.
  - 2.4 Concrete Repair Material shall comply with Applicable standards and/or.
  - 2.5 Sand shall comply with ASTM C 33.
  - 2.6 Portland cement shall comply with ASTM C 150, Type V.
  - 2.7 Rubble shall consist of broken concrete or broken stone.
- 3.0 EXECUTION:
  - 3.1 Algae Removal shall be by mechanical or manual methods and shall include, but not be limited to, skimming, pumping through a screen, raking, or draining and cleaning the lagoon.
  - 3.2 Slope and Dike Reconstruction shall be made to re-establish the original design configuration and grades. Place riprap, where required, so that its angle of repose is not exceeded.
  - 3.3 Liner Reconstruction and Repair shall be made with materials compatible with the existing liner and compatible with the wastewater and sludge to be contained therein.
  - 3.4 Repairs to Elastomeric Membrane Liners shall be made with like material and shall overlap all cuts, tears, fractures or other defects a minimum of 4 inches. Cut repair pieces square or rectangular. The method of bonding the new material to existing material shall be similar to the original joint banding method, except when the original joints have failed. In this case, the material supplier shall demonstrate that an alternate jointing system shall be satisfactory to the Authorized Member Representative. Replace earth or sand cover removed during repair or replacement of plastic liner to the same thickness as the original installation.
  - 3.5 Repairs to Non-Elastomeric Membrane Liners shall be made by cutting out defective areas back to

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sound liner material and replacing with similar material. Joints shall be watertight.

**Fences and Gates**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of fences and gates. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Ground Rods, Down Conductors, and Connectors:
    - 2.1.1 Ground Rods: Galvanized steel rods, 3/4 inch in diameter by 10 feet in length.
    - 2.1.2 Down Conductors: No. 8 copper wire or equivalent.
    - 2.1.3 Connectors: Pressure type bolted or compression type.
  - 2.2 Foundations shall be concrete with a minimum 28-day strength of 3,000 psi, and shall extend from 3 feet 6 inches below finished grade to 2 inches above finished grade. Tops of foundations shall slope away from posts. Extend gate post foundations to the underside of the bottom hinge. Foundations for line posts shall be 10 inches in diameter. Foundations for terminal and gate posts shall be the diameter of the post plus 8 inches but not less than 12 inches.
- 3.0 EXECUTION:
  - 3.1 Existing Fence Connections: Wherever new fencing joins an existing fence, either at a corner or at the intersection of straight line fences, a corner post with brace post shall be set at the junction and braced. If the connection is made elsewhere than the corner of the fencing, the last span of the existing fence shall contain a brace span.
  - 3.2 Security Fence: Wherever existing fencing fabric is embedded in concrete or earth, or attached to an earth-embedded galvanized steel sheet, repairs shall be made as follows:
    - 3.2.1 Earth Embedment: Install new fabric or galvanized steel sheet to depth of existing. Attach steel sheet securely to adjacent existing sheeting and new and existing fencing fabric. Thoroughly backfill and compact soil in repair area.
    - 3.2.2 Concrete Embedment: Install fence fabric to the depth of existing fabric. Place concrete to match existing configuration. Clean all exposed fencing of concrete that is a result of new construction.
  - 3.3 Gate Installation: Install, plumb, level, and secure for full opening without interference. Install ground-set items in concrete for anchorage, as recommended by the fence manufacturer. Install and adjust hardware for smooth operation and lubricate where necessary.
  - 3.4 Grounding: Ground on each side of every gate where crossed by high-tension-line crossings, at 1,000 to 1,500 foot intervals along fence in isolated areas, and at 500 to 750 foot intervals when in close proximity (100 feet or less) to public roads, highways, and buildings. Down conductors shall run full height of fence wherever wood posts are used and shall be securely fastened to each strand of wire to provide electrical continuity.
  - 3.5 Field Painting: At the completion of repair work, touch up all surfaces damaged by construction operations. Galvanized surfaces shall be painted with zinc-oxide paint. Wood, steel, vinyl coated, aluminized, and other fencing materials shall be touched up following the manufacturer's recommendations or to match existing finish.
  - 3.6 Final Grading: The final ground surface shall be graded to remove irregularities and maintain the clearance between the bottom of the fence and the ground surface.
  - 3.7 Seeding and Sodding: Seed or sod all lawn areas disturbed by repair and maintenance operations with a plant variety of the same species as that in adjacent areas. Areas where grass does not take hold shall be reseeded or resodded as directed by the Authorized Member Representative.

**Steel Chain Link Fencing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of steel chain-link fencing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

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2.0 PRODUCTS:

- 2.1 Galvanized Fabric shall comply with Fed. Spec. RR-F-191/1, Type I, of 9 gauge wire and 2-inch mesh.
- 2.2 Framework: Posts, top rails, and braces shall be galvanized steel pipe in compliance with Fed. Spec. RR-F-191/3, Class 1.
- 2.3 Gates shall comply with Fed. Spec. RR-F-191/2 and shall be of the same type, size, and shape as the existing. Provide a keeper to automatically engage and hold the gate leaf open until manually released, a center plunger rod, a center stop, vertical lift framework, and sliding track.
- 2.4 Electric Operator for gates shall include a totally enclosed motor, starter, gear reduction, clutch, limit switch, and housing. Operator shall be controlled by an electric lock. Slide gate operators shall be equipped with magnetic brake, manual disconnect, and chain drive. Swing gate operators shall be equipped with a crank arm.
- 2.5 Accessories:
  - 2.5.1 Barbed Wire shall comply with Fed. Spec. RR-F-191/4 and shall be two strands of 12-1/2 gauge galvanized steel wire, twisted, with four point barbs spaced five inches apart.
  - 2.5.2 Post Caps: Pressed steel or malleable iron, galvanized, and of the configuration required.
  - 2.5.3 Extension Arms for barbed wire shall extend outward at a 45 degree angle and shall have provision for attaching three strands of barbed wire with the top strand approximately one foot above the fence fabric.
  - 2.5.4 Stretcher Bars: Minimum 3/16-inch by 3/4-inch steel bars, galvanized in compliance with ASTM A 123.
  - 2.5.5 Stretcher Bar Bands: Heavy pressed steel bands, galvanized in compliance with ASTM A 123.
  - 2.5.6 Tension Wire: Spring coil or crimped wire of minimum seven gauge galvanized steel with minimum tensile strength of 80,000 pounds per square inch and coating as specified for the fabric.
  - 2.5.7 Fasteners: Steel wire with an ASTM A 641, Class 1 galvanized coating.
  - 2.5.8 Slat Inserts: California Redwood treated with a stain preservative to maintain appearance.
  - 2.5.9 Boulevard Clamps: Stamped 13 gauge mild steel, galvanized, in compliance with ASTM A 641, Class 1. Clamps for vinyl coated fence shall have the vinyl coating applied over the zinc coating.
- 3.0 EXECUTION:
  - 3.1 Posts: Set plumb, in straight alignment with other posts, evenly spaced and rigidly set. Set posts to a depth of 3 inches above the bottom of the concrete foundation.
  - 3.2 Rails:
    - 3.2.1 Top Rail: Install continuous through post caps, securely fastening to end, corner, pull, and gate posts with rail end.
    - 3.2.2 Intermediate and bottom rails: Attach to line posts with boulevard clamps and to terminal posts with rail ends.
  - 3.3 Truss Bracing: Securely fasten to end, corner, pull, and gate posts 12 inches below cap and extend to the adjacent line post. Braces shall be trussed from the line post to the bottom of the terminal post with round rods and turnbuckles.
  - 3.4 Fabric:
    - 3.4.1 Repair (Cutting and Patching) of Fabric: Cut out the damaged fabric, position new fabric to line up with existing mesh, and securely fasten to existing fabric.
    - 3.4.2 Replacement of Fabric: Stretch to proper tension and securely fasten to terminal posts using stretcher bars.
    - 3.4.3 Restretching Existing Fabric: Stretch existing fabric indicated to be restretched to proper tension and refasten to posts and rails.
  - 3.5 Barbed Wire: Stretch and secure to extension arms with heavy wire pins.
  - 3.6 Gate Hinges: Install to prevent twisting or turning under action of the gate and to swing through 180 degrees from closed to open position.

**Steel Rod and Bar Fencing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of steel rod and bar fencing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product

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manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Pickets shall be of height and style required to match existing, solid mild steel bar, galvanized in compliance with ASTM A 123.

2.2 Framework: Posts and rails shall be of length and style to match existing, solid mild steel, galvanized in compliance with ASTM A 123.

2.3 Gates:

2.3.1 Frame: Galvanized steel, all welded construction.

2.3.2 Truss Rods: Galvanized steel as required for stability, minimum 3/16 inch in diameter.

2.3.3 Hardware: Gate latches, hinges, gate track, trolley, rollers, plunger rod, and locks as required.

2.4 Accessories:

2.4.1 Brackets: Malleable iron or pressed steel of the sizes and configurations required to adequately support attached members, minimum 3/16 inch thick.

2.4.2 Trim: Flat caps for all posts and pickets where required. Caps shall be galvanized cast iron or zinc die castings of thickness standard to the manufacturer.

2.4.3 Sleeves: Where required, sleeves shall be minimum 16-gauge steel tubing of the required configuration to receive post. Sleeves shall be galvanized in compliance with ASTM A 123.

3.0 EXECUTION:

3.1 Pickets: Fasten pickets to rails with clip angles and bolts and nuts.

3.2 Posts: Set posts in sleeves or footings as required to match existing conditions.

3.3 Brackets: Brackets for wall mounting and change of grade shall be securely fastened to wall and/or posts with appropriate fasteners.

3.4 Alignment: Finished fencing shall be in proper alignment with all posts plumb.

3.5 Welding: Comply with AWS D1.1.

3.6 Repair: Items shall be straightened, welded, sufficiently bolted, or otherwise strengthened as required.

**Wrought Iron Rod and Bar Fencing**

1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of wrought iron rod and bar fencing including ornamental malleable iron fencing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

2.0 PRODUCTS:

2.1 Pickets shall be 3/8-inch square wrought iron rods of the required length and configuration.

2.2 Gates: Hardware shall be compatible with existing hardware in appearance and function.

2.3 Accessories:

2.3.1 Brackets: Brackets for fastening fencing to walls, floor, posts, and other attachments shall be wrought iron.

2.3.2 Trim: Provide iron trim items as required.

2.3.3 Bolts and Nuts shall be ASTM A 307 and galvanized in compliance with ASTM A 153.

3.0 EXECUTION:

3.1 Pickets shall be welded to rails. Welding shall comply with AWS standards and shall seal the joint against moisture.

3.2 Rails shall be securely fastened to posts with angle brackets.

3.3 Posts shall be set in sleeves or footings to match existing conditions. Posts set in sleeves shall have the annular space between the sleeve and post filled with lead or sulfur.

3.4 Brackets for wall mounting and change of grade shall be securely fastened to wall and/or posts with appropriate fasteners.

3.5 Gates:

3.5.1 Frame: Iron rod and bar rails and pickets shall be welded with full welds into sections in a pattern matching existing fencing. Rail-and-picket sections shall be fastened to posts with angle brackets, bolts, and nuts.

Attachment 1: Specifications for the Work

3.5.2 Bracing: Iron rod or bar braces shall be welded in place when required to strengthen the gate.

**Precast Concrete and Masonry Fencing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of precast concrete and masonry fencing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Fence Materials:
    - 2.1.1 Pre-Cast Concrete: Match existing fencing units in all dimensions, patterns, colors, and textures. Units shall comply with ASTM C 145 Grade N, Type 1 for solid units and ASTM C 90 Grade N, Type 1 for hollow units, and ACI 318 as applicable.
    - 2.1.2 Brick: Exposed brick masonry shall comply with ASTM C 216, Grade SW. Brick for below grade shall comply with ASTM C 62, Grade SW. Brick shall be selected for appearance to match existing brick in dimension, color, and texture.
    - 2.1.3 Mortar:
      - 2.1.3.1 Mortar shall comply with ASTM C 270, Type S and shall be 1 part Portland cement (ASTM C 150), 1/2 part lime (ASTM C 207), and 4-1/2 parts sand (ASTM C 144). Sand for joints 1/4 inch or less shall pass a No. 16 sieve. Sand containing any substance that will stain the masonry shall not be used. Waterproofing admixtures shall be approved by the Authorized Member Representative.
      - 2.1.3.2 Colored Mortar shall be a factory-formulated mixture of masonry cement complying with ASTM C 91 and mortar color.
    - 2.1.4 Masonry Grout: Coarse grout for masonry lintels and for filling cells in masonry units shall consist of 1 part Portland cement, 1/10 part lime, and 1-1/2 parts sand. Fine grout for bedding and grouting steel and for all other applications shall consist of 1 part Portland cement, 1/10 part lime, and 2-1/2 parts sand. Use waterproofing admixture in all grout used in exterior walls.
  - 2.2 Posts:
    - 2.2.1 Line Posts: Line posts shall be of the same materials and configuration as existing posts with reinforcing as required.
    - 2.2.2 Terminal and Corner Posts: Match existing terminal and corner posts in configuration and adequately reinforce.
    - 2.2.3 Gate Posts: Gate posts shall have all attachments for gates firmly embedded and shall be of sufficient strength to withstand stresses applied by the gate.
  - 2.3 Rails: Rails shall be of the same materials and configuration as existing rails with all accessories for firmly attaching to posts.
  - 2.4 Gates:
    - 2.4.1 Frame: Constructed of 2 x 4 wood members with attached pickets. Configuration of gate shall match that of existing gates.
    - 2.4.2 Gate Bracing shall consist of a single 2 x 4 running diagonally across the gate to opposite corners of the frame. High end of brace shall be at hinge edge of gate.
    - 2.4.3 Hardware: Hinges, latches, and other hardware shall be hot-dipped galvanized steel in compliance with ASTM A 153 and of configurations to match existing hardware.
    - 2.4.4 Padlock: Padlocks shall comply with ASTM F 883.
  - 2.5 Accessories:
    - 2.5.1 Special Shapes: Special shapes, including copings and post caps, shall be as required to match existing units to be replaced.
    - 2.5.2 Reinforcement: Masonry reinforcement, anchors, and ties shall comply with the following requirements:
      - 2.5.2.1 Reinforcement Bars shall comply with ASTM A 615, Grade 40.
      - 2.5.2.2 Joint reinforcement shall be prefabricated from zinc-coated cold drawn steel wire in compliance with ASTM A 641. Provide prefabricated pieces for corners and intersections of walls. Reinforcement shall be truss type, approximately two inches narrower than the nominal thickness of wall.

Attachment 1: Specifications for the Work

- 2.5.2.3 Wire-Mesh Ties shall be 16-gauge or larger zinc-coated steel wire woven into 1/2-inch mesh and cut in strips one inch narrower than the width of walls in which they are used. Zinc-coating shall comply with ASTM A 641.
- 2.5.2.4 Wire Brick Ties shall be fabricated from 3/16-inch diameter zinc-coated steel wire complying with ASTM A 641.
- 2.5.3 Attached Items: Light fixtures and miscellaneous items attached to the fencing shall be provided with appropriate means for securely fastening to fence components.
- 2.5.4 Bolts and Nuts shall be ASTM A 307 and galvanized in compliance with ASTM A 153.
- 2.6 Foundations:
  - 2.6.1 Material: Where foundation work is required for maintenance and repair, the new foundation shall match the existing foundation in materials and design.
  - 2.6.2 Depth: Foundations shall extend below frost line or to the depth of existing foundations, whichever is greater.
- 3.0 EXECUTION:
  - 3.1 General:
    - 3.1.1 All Scaffolding and Falsework shall be ample strength and well secured. Masonry work exceeding 10 feet in height shall be properly braced and supported until masonry is self-supporting.
    - 3.1.2 Where Fresh Masonry Joins Partially or Totally Set Masonry, clean the exposed surface of the set masonry to obtain the best possible bond with the new work. Remove all loose masonry units and mortar.
  - 3.2 Mixing Mortar and Grout:
    - 3.2.1 Mix in a Mechanical Batch Mixer for a minimum of 5 minutes after all materials have been added.
    - 3.2.2 Mix Grout in compliance with ASTM C 476. Grout shall have a consistency at time of placement to yield a slump of 10 to 11 inches as determined by ASTM C 143.
  - 3.3 Reinforcement:
    - 3.3.1 Install Horizontal Continuous Joint reinforcement in all unit masonry fences. Reinforcement shall start not more than 8 inches above the masonry supporting surface and end within the top full mortar joint, or to match existing conditions and shall be spaced at maximum 16-inch centers vertically.
    - 3.3.2 Joint reinforcement shall be placed approximately 1/2 inch from masonry faces.
    - 3.3.3 At intersections, bond each course with wire mesh ties or prefabricated Joint reinforcement spaced not to exceed 16 inches vertically.
    - 3.3.4 Install Vertical Reinforcement bars of the size indicated on the drawings in the hollow cores of masonry units as required. Fill all cells containing reinforcement for the full height of the reinforcement with grout.
  - 3.4 Precast Concrete:
    - 3.4.1 Bond shall be laid to match existing pattern. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Webs shall also be bedded in all courses of posts, in starting course on footings and solid foundation walls and around cells that are to be reinforced or filled with grout.
    - 3.4.2 All Exposed Mortar Joints shall be tooled with a round jointer to produce smooth, dense, concave joints, except as otherwise required to match existing mortar joints.
  - 3.5 Brick:
    - 3.5.1 Bond shall be laid out to maintain joints to uniform thickness throughout.
    - 3.5.2 Brick shall be laid with completely filled mortar joints to match existing. Mortar beds shall be spread smooth. The ends of brick shall be buttered with sufficient mortar to fill the end joint.
    - 3.5.3 All Exposed Mortar Joints shall be tooled with a round jointer to produce smooth, dense, concave joints.
  - 3.6 Pointing and Cleaning: Upon completion, all new joints shall be carefully pointed, filling all holes. Cut out defective joints and repoint them with mortar. Keep all exposed masonry clean and free of mortar as the work progresses. Clean masonry surfaces using fiber brushes and trisodium phosphate solution; acid shall not be used for any masonry cleaning. Rinse surfaces with clean water immediately after cleaning.

Attachment 1: Specifications for the Work

**Permanent Wood Fencing**

- 1.0 DESCRIPTION OF WORK: The specification covers the furnishing and installation of materials for repair and maintenance of permanent wood fencing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Pickets:
    - 2.1.1 Size: Wood for pickets shall match the existing fencing in material, configuration, dimensions, texture, and finishes.
    - 2.1.2 Attachment: Hot-dipped galvanized nails complying with Fed. Spec. FF-N-105 shall be used to fasten pickets to rails.
  - 2.2 Framework:
    - 2.2.1 Line Posts: 4 x 4 of required length to match existing post height and extend into the ground as required to assure rigid installation.
    - 2.2.2 Terminal and Corner Posts: 4 x 4 of required length.
    - 2.2.3 Gate Posts: 4 x 6 and of the length required for firm embedment to resist gate action.
    - 2.2.4 Top Rail: 2 x 4 of length required to span between posts.
    - 2.2.5 Where Bracing is Required, it shall match top and bottom rails in dimension and finish.
    - 2.2.6 Metal Posts and Rails: Solid mild steel galvanized in compliance with ASTM A 123 of the length and style required to match existing.
  - 2.3 Gates:
    - 2.3.1 Frame: 2 x 4 members with attached pickets. Configuration of gate shall match that of existing gates.
    - 2.3.2 Bracing: Single 2 x 4 running diagonally across the gate to opposite corners of the frame.
    - 2.3.3 Hardware: Hinges, latches, and other hardware shall be hot-dipped galvanized and of configurations to match existing hardware. Bolts and nuts shall comply with ASTM A 307 and galvanized in compliance with ASTM A 153.
  - 2.4 Finish: All wood fence members shall be given a pressure preservative treatment in a closed retort. The treatment shall comply with Fed. Spec. TT-W-00571. Wood cut or sawed after treatment shall have the cut surfaces well brush-coated with the preservative used in the treatment. Paint to match existing after treatment and installation.
- 3.0 EXECUTION:
  - 3.1 Posts: Hold in line in a true vertical position by temporary bracing until backfilling is completed. Compact by hand tamping or other suitable methods to a density comparable to that of adjacent ground. Posts of fencing that are higher than four feet and exposed to strong winds and posts at all gates shall be of heavy construction and shall be embedded in concrete.
  - 3.2 Rails: Install at the height and in the manner required to match existing fencing, and secure to post with fasteners similar to existing.
  - 3.3 Pickets: Space, attach, and position to match existing pattern and attachment methods.
  - 3.4 Accessories: Install to match existing conditions.

**Temporary Fencing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of temporary fencing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Pickets:
    - 2.1.1 Size: Wood pickets shall be 3/8 inch thick, 1-1/2 inches wide, and 48 inches high.
    - 2.1.2 Coating: Red oil paint or stain.
    - 2.1.3 Spacing: Approximately two inches apart.
    - 2.1.4 Attachment: Bind together with three double strands of wire.

Attachment 1: Specifications for the Work

2.2 Framework:

- 2.2.1 Materials: Wire shall be 13 gauge galvanized steel, complying with ASTM A 641.
- 2.2.2 Types: The framework shall consist of three parallel double strands of wire twisted between pickets to hold them securely in place.
- 2.2.3 Wire Connectors: Wire for attaching fabric to metal posts shall be nine gauge.
- 2.2.4 Staples and Nails shall comply with Fed. Spec. FF-N-105. Staples and nails shall be zinc-coated and of sufficient length for purpose required.

2.3 Gates:

- 2.3.1 Frame: Frames shall consist of two parallel horizontal wooden members with pickets attached at two-inch spacing.
- 2.3.2 Bracing: Two wooden members placed diagonally on the gate between the frame boards.
- 2.3.3 Hardware shall include two strap hinges, latching device, and stop bar, all of zinc-coated steel, in compliance with ASTM A 153.

2.4 Supports:

- 2.4.1 Steel: Line posts and uprights shall be drive type, T sections, and provided with suitable anchor plate. The sections shall be hot-rolled steel complying with ASTM A 702, galvanized in compliance with ASTM A 123. The T sections shall have the following minimum sizes:

Post Length (Feet)	Post Weight (Pounds)
5	7.32
5 1/2	7.99
6	8.65
6 1/2	9.32
7	9.98
7 1/2	10.64
8	11.31
9	12.64
10	13.97

- 2.4.2 Wood: Posts shall be cut from cedar, Douglas fir, pine, or other approved species of timber. Posts shall be peeled, treated, dressed, and cured. All wood posts and braces shall be given a pressure preservative treatment in a closed retort. The treatment shall comply with Fed. Spec. TT-W-00571. Wood cut or sawed after treatment shall have the cut surfaces well brush-coated with the preservative used in the treatment.
- 2.4.3 Braces: Steel braces shall have same configuration as line posts and uprights without the anchor plate. Wood braces shall be treated No. 2 or better grade, Douglas fir or southern yellow pine. Braces shall meet all of the requirements for wood posts.
- 2.4.4 Location: Posts shall be evenly spaced to adequately support the fence framework.

3.0 EXECUTION:

- 3.1 Wood Posts: Hold in line in a true vertical position by temporary bracing until backfilling is completed. Compact by hand tamping or other suitable methods to a density comparable to that of adjacent ground.
- 3.2 Steel Posts: Hold in a vertical position and drive to the required depths by an approved post driver. Post tops shall not be damaged during driving.
- 3.3 Corner, Brace, Or End Panels: Construct corner, brace, or end panels at the beginning and terminal ends, at gate openings, at all intersections, and at all corners or changes in horizontal alignment of fences, in existing fence on both sides of junction with new fence (except when junction is at a corner already braced), and on both sides of cattle guards.
- 3.4 Pull Posts shall be constructed when the distance of unbraced fencing exceeds 640 feet. Pull posts shall be spaced equidistant in the fence at intervals of 640 feet or less.
- 3.5 Framework Installation: Stretch to proper tension and securely fasten to posts. Top and bottom wires of fabric shall be tied or stapled to each post. Tie or staple every other wire to alternating posts. Every wire shall be tied or stapled to corner, pull, end, and gate posts. Wire for tied fabric shall be nine gauge.
- 3.6 Picket Replacement: Where required, new pickets shall be securely fastened into the existing wire

Attachment 1: Specifications for the Work

framework using 13 gauge galvanized wire.

- 3.7 Restretching Existing Fabric: Fabric designated to be restretched shall be restretched to proper tension and refastened to posts. Excess fabric extending beyond the post shall be removed.

**Farm-Type Wire Fencing**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for the repair and replacement of farm-type wire fencing. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Fabric shall be galvanized steel wire complying with ASTM A 116.
  - 2.2 Framework:
    - 2.2.1 Steel:
      - 2.2.1.1 Posts shall comply with ASTM A 702, T-section, zinc-coated.
      - 2.2.1.2 Stays shall be 9-1/2 gauge twisted wire, galvanized in compliance with ASTM A 641, Class 3.
    - 2.2.2 Wood: Posts shall be cut from cedar, Douglas fir, pine, or other approved species of timber. Posts shall be peeled, treated, dressed, and cured and shall contain no unsound knots. All posts shall match existing post dimensions. All wood posts and braces shall be given a pressure preservative treatment in a closed retort. The treatment shall comply with Fed. Spec. TT-W-00571. Wood cut or sawed after treatment shall have the cut surfaces well-coated with the preservative used in the treatment.
  - 2.3 Braces: Steel braces shall have the same configuration as line posts and uprights without the anchor plate. Braces shall meet all of the requirements for wood posts.
  - 2.4 Connectors:
    - 2.4.1 Wire for Attaching Fabric to Posts shall be 12-1/2 gauge or coarser, galvanized in compliance with ASTM A 641, Class 3.
    - 2.4.2 Staples and Nails shall comply with Fed. Spec. FF-N-105. Staples and nails shall be zinc-coated and of sufficient length for purpose required.
  - 2.5 Gates:
    - 2.5.1 Tubular Steel:
      - 2.5.1.1 Frame shall be a minimum of 1-3/8 inch outside diameter tubular steel, braced with a sturdy center bar and diagonal adjustable brace wire to prevent sagging. Gates shall be fitted with hinges. All material shall be hot-dipped zinc-coated.
      - 2.5.1.2 Fabric for Gates shall be as specified for the fence and shall be securely tied to the framework at top, bottom, and sides with 9-gauge wire.
    - 2.5.2 Angle Iron:
      - 2.5.2.1 Frame shall be fabricated of angle iron with cross ties and stays of light angle iron. Frame shall be zinc-coated in compliance with ASTM A 120 or A 153.
      - 2.5.2.2 Fabric for Gates shall be as specified for the fence and shall be securely tied to the framework at top, bottom, and sides with 9-gauge wire.
    - 2.5.3 Wood: Provide a 3/8-inch minimum diameter galvanized steel truss rod and turnbuckle.
  - 2.6 Barbed Wire:
    - 2.6.1 Barbed Wire shall comply with ASTM A 121 and shall be made from 2 strands of 12-1/2 gauge galvanized steel wire, twisted, with four-point barbs spaced five inches apart. Wire shall have Class 2 zinc coating.
  - 2.7 Hardware:
    - 2.7.1 Gate Hardware shall include the following:
      - 2.7.1.1 Bottom Hinge shall be designed to carry the weight of the gate.
      - 2.7.1.2 The Upper Hinge shall be adjustable.
      - 2.7.1.3 Lock with Chain shall be 1-3/4 inch size complying with ASTM F 883.
      - 2.7.1.4 Keeper shall automatically engage and hold the gate leaf open until manually released.
      - 2.7.1.5 Center Plunger Rod.
      - 2.7.1.6 Center Stop.

Attachment 1: Specifications for the Work

- 2.7.1.7 Vertical Lift.
- 2.7.1.8 Sliding Track.
- 2.7.2 Lightning Arresters, Insulators and Insulator Clamps, Fasteners, Signs, and Other Accessories shall be provided and installed as required.
- 3.0 EXECUTION:
- 3.1 Wood Posts: Hold in line in a true vertical position by temporary bracing until backfilling is completed. Compact by hand tamping or other suitable methods to a density comparable to that of adjacent ground. Refasten all braces, gates, hardware, fabric, and other accessories.
- 3.2 Steel Posts: Steel posts shall be held in a vertical position and driven to the required depths by an approved post driver. Tops of posts shall not be damaged by driving operation.
- 3.3 Corner, Brace, or End Panels: Corner, brace, or end panels shall be constructed at the beginning and terminal ends, at gate openings, at all intersections, at all corners or changes in horizontal alignment of fences, in existing fence on both sides of junction with new fence, (except when junction is at a corner already braced), and on both sides of cattle guards.
- 3.4 Pull Posts shall be constructed when the distance of unbraced fencing exceeds 640 feet. Pull posts shall be spaced equidistant in the fence at intervals of 640 feet or less.
- 3.5 Wire Installation: Barbed and/or woven wire fabric shall be stretched to proper tension and securely fastened to posts. Top and bottom wires of fabric shall be tied or stapled to each post. Tie or staple every other wire to alternating posts. Every wire shall be tied to corner, pull, end, and gate posts. Wire for tying woven wire fabric and barbed wire shall be 9-gauge.
- 3.6 Restretching Existing Fabric: Fabric indicated to be restretched shall be restretched to proper tension and refastened to posts. Excess fabric extending beyond the post shall be removed.
- 3.7 Alignment: Finished fencing shall be plumb and in proper alignment with posts, and all wire work shall be taut.

**Electrical Traffic Control Signals**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of electrical traffic control signals. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 General: Replacement equipment items shall be regularly manufactured products.
- 2.2 Concrete Poles: Cement ASTM C 150; aggregate ASTM C 33; minimum compressive strength 6,000 psi when tested in compliance with AASHTO T22. Tensioning steel shall comply with ASTM A 603. Strands shall not be tensioned above 70 percent of the rated ultimate strength. Epoxy compound for sealing hollow cores shall comply with ASTM D 1763.
- 2.3 Galvanized Conduit Nipples: UL 514B.
- 2.4 Ground Wire: Cast-in-concrete pole, No. 6 stranded bare wire, ASTM A 603.
- 2.5 Wood Poles: ANSI 05.1, waterborne preservative-treated in compliance with AWPA C3, Retention Zone 1.
- 2.6 Structural Steel: ASTM A 36.
- 2.7 Steel Pipe: ASTM A 53.
- 2.8 Steel Bars: ASTM A 576.
- 2.9 Wire Strand: ASTM A 475.
- 2.10 Zinc Coatings: Members, ASTM A 123; fasteners, ASTM A 153.
- 2.11 Mast Arms for Supporting Traffic Signals: ASTM A 36; aluminum alloy 3003, or alloy alcad 3004 complying with ASTM B 209.
- 2.12 Concrete for Pull Boxes: ASTM C 94, 3,000 psi.
- 2.13 Cast-Iron Covers: ASTM A 48.
- 2.14 Signal Lens: Manufactured in compliance with Article 5 and 6, ITE Technical Report Number 1.
- 2.15 Loop Wire for Vehicle Detectors: No. 14 AWG or No. 12 AWG, stranded copper wire, type TTHN, THWN, or THW, ASTM B3.
- 2.16 Grout: One part cement complying with ASTM C 150 and two parts sand complying with ASTM C

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- 33.
- 2.17 Conduit: Polyvinyl chloride, UL 651, Schedule 40 or galvanized rigid metal, ASTM B3.
- 2.18 Ground Wire: Soft drawn copper, bare, stranded, ANSI C7.1.
- 2.19 Electrical Work: NFPA No. 70.
- 3.0 EXECUTION:
- 3.1 Scheduling and Coordination: The Contractor shall ensure that required notices have been given and that power interruptions have been scheduled and approved.
- 3.2 Traffic: Provide temporary traffic signs at and around work area. Signs and locations shall be as approved by the Authorized Member Representative.
- 3.3 Vehicle Detector Assemblies, Loop Type: Saw out existing loops to be replaced to their full depth. Install and seal loop wire. Splice and solder loop wire and lead-in cable and wrap a minimum of two wraps with silicone tape and heavy-duty electrical tape. Install sealant in compliance with the manufacturer's recommendations. Excavate and remove existing lead-in cable to be replaced, and install new lead-in cable in place and connect to cabinet ground.

**Traffic Signs**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of traffic signs. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Sign Foundations:
  - 2.1.1 Replacement Foundation Footing Concrete shall be a mixture of cement complying with ASTM C 150 and aggregate complying with ASTM C 33. Compressive strength shall be 2,800 psi at 28 days.
  - 2.1.2 Sulfur Mortar shall comply with ASTM C 287.
  - 2.1.3 Reinforcing Steel shall comply with ASTM A 615.
- 2.2 Sign Supports shall be of the "break-away" type. Supports shall be strong enough to resist applicable wind forces without damage, but shall be designed to experience a brittle rupture type failure or a "quick separation" type joint.
  - 2.2.1 Sign Support, Aluminum:
    - 2.2.1.1 Replacement Castings shall be Alloy A356.0-T6 in compliance with ASTM B 108.
    - 2.2.1.2 Replacement Structural Members shall comply with ASTM B 308.
    - 2.2.1.3 Replacement Bars, Rods, Shapes, and Tubes shall comply with ASTM B 221, alloy 6061-T6.
    - 2.2.1.4 Replacement Bolts, Nuts, and Screws shall match items being replaced and shall be alloy 2024-T4 with anodic coating complying with ASTM B 580, or 6061-T6 in compliance with ASTM B 211. Bolt heads shall be hexagon. Bolt threads shall be Class 2, 2A, or 2B in compliance with ANSI B18.2.1. Nuts shall be hexagon shaped in compliance with ANSI B18.2.2.
    - 2.2.1.5 Replacement washers shall be furnished from sheet metal complying with ASTM B 209, alloy alclad 2024-T3 or T4.
  - 2.2.2 Sign Support, Steel:
    - 2.2.2.1 Replacement Structural Members shall comply with ASTM A 36.
    - 2.2.2.2 Replacement Bars shall comply with ASTM A 108.
    - 2.2.2.3 Replacement Pipe shall comply with ASTM A 53 standard weight.
    - 2.2.2.4 Replacement Fasteners shall comply with ASTM A 307 and ASTM A 325.
    - 2.2.2.5 Replacement Anchor Bolts for anchoring base plates to concrete bases and nuts and washers shall be galvanized in compliance with ASTM A 153.
  - 2.2.3 Sign Support, Wood:
    - 2.2.3.1 Replacement Wood Sign Post shall be of the species listed in AASHTO M168, dressed four sides and having a pyramidal top cut before being treated.
    - 2.2.3.2 Replacement Sign Post shall be pressure treated with creosote or creosote-tar solution complying with AWPB LP-55.
- 2.3 Sign Face:
  - 2.3.1 Replacement Plywood Sign Face shall be grade HDOAB G-1 EXTERIOR, in compliance with DOC PS 1. Material shall be cut to size in compliance with ANSI D6.1E.

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- 2.3.2 Replacement Galvanizing Steel Sign Face shall comply with USDOT FHA MUTCD.
- 2.4 Reflective Sheeting shall be enclosed lens unless otherwise directed by the Authorized Member Representative.
  - 2.4.1 Enclosed Lens Reflective Sheeting shall comply with Fed. Spec. L-S-300.
  - 2.4.2 Reflective Sheeting shall comply with FP-79 minimum reflective intensity. Measurements shall comply with Fed. Spec. L-S-300.
  - 2.4.3 Color shall be matched visually and within the limits shown on the Color Tolerance Charts issued by the Federal Highway Administration. The diffuse day color of the reflective sheeting shall be determined in compliance with ASTM E 97.
  - 2.4.4 Film:
    - 2.4.4.1 General: Reflective sheeting shall be sufficiently flexible to be easily cut to shape and permit application over, and conformance to, moderate shallow embossing characteristic of certain sign borders and symbols.
    - 2.4.4.2 Surface: Sheeting surface shall be smooth and flat, shall facilitate cleaning and wet performance, and shall exhibit 85 degrees glossmeter rating of not less than 40, as specified in ASTM D 523. The sheeting surface shall withstand cleaning with gasoline, VM&P Naphtha, mineral spirits, turpentine, methanol, and xylol.
- 2.5 Demountable Sign Face Materials:
  - 2.5.1 Acrylic Plastic Reflectors: Replacement demountable sign letters, digits, arrows, borders, and alphabet accessories shall be reflectorized and shall consist of acrylic plastic reflectors supported by embossed aluminum frames. They shall comply with the Standard Alphabet for Highway Signs, of the Federal Highway Administration, Series E.
  - 2.5.2 Design and Fabrication: The letters shall be modified as necessary to accommodate the required reflectors. All items except border strips shall be fabricated from 0.040-inch minimum sheet aluminum. Border strips shall be of 0.032-inch minimum sheet aluminum. Mounting holes shall be provided within the frames to permit the use of screws, rivets or other acceptable fasteners. The size and spacing of the reflector holes shall provide maximum night legibility and visibility of the finished cutout figure.
  - 2.5.3 General Requirements: The reflectors shall be of acrylic plastic meeting the requirements of Fed. Spec. L-P-380, Type I, Class 3. The reflectors shall be yellow or colorless. The lens shall consist of a smooth front surface, free from projections or indentations other than for identification, and a rear surface bearing a prismatic configuration that will effect total internal reflection of light.
  - 2.5.4 Reflective Sheeting:
    - 2.5.4.1 Demountable Sign Letters, Digits, Arrows, Borders, and Alphabet Accessories, when so specified, shall be reflectorized with reflective sheeting supported by flat aluminum backing and shall comply with the Standard Alphabet Highway Signs of the Federal Highway Administration.
    - 2.5.4.2 Design and Fabrication: Letter design shall be Series E, modified for legibility. All items except border strips shall be fabricated from 0.040-inch sheet aluminum, 6061-T6 alloy, with mounting holes to permit use of screws, rivets, or other acceptable fasteners.
- 2.6 Highway Delineators, Enclosed Lens Type: Replacement reflectors shall be of acrylic plastic and a minimum of 3 inches in diameter. They shall be mounted in a heavy-duty housing with a back plate. The reflector shall consist of a clear and transparent plastic lens, which shall be colorless, and a plastic back of the same material, fused to the lens under heat and pressure around the entire perimeter to form a homogeneous unit, permanently sealed against dust, water, and water vapor. The acrylic plastic shall comply with Fed. Spec. L-P-380, Type I, Class 3.
- 2.7 Highway Delineators, High Intensity Type:
  - 2.7.1 Replacement Reflectorized Delineators shall consist of a reflective sheeting compound of glass spheres, embedded in a weatherproof, synthetic, noncellulose material. The overall size of the plastic reflectors shall be 4 inches by 5 inches, with a reflective area of at least 17.5 square inches.
  - 2.7.2 Delineators shall be silver-white when viewed with reflected light.
- 2.8 Highway Delineators Including Posts and Attachments:
  - 2.8.1 Reflective Sheeting: Replacement reflective sheeting for delineators shall match delineators being replaced.
  - 2.8.2 Delineator Posts and Accessories shall be of steel or aluminum. They shall have the necessary holes

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- for attachment of the delineator housing. The assembly shall be furnished with the necessary bolts, nuts, and washers for attaching to the posts.
- 2.8.3 Insulating Materials: Neoprene, for separation of aluminum and steel parts, shall contain at least 60 percent, by volume, of pure neoprene. Other material may be used, subject to the approval of the Authorized Member Representative as to pliability and ability to withstand wear caused by stretching or distortion.
- 2.8.4 Reflector Units for guardrail installation shall match existing reflector being replaced in size and color.
- 2.8.5 Highway Delineators shall be supplemented with directional guidance signs as directed by the Authorized Member Representative. Signs shall be the chevron alignment type and shall comply with ANSI D6.1E, Type W 1-8.
- 2.9 Painting Panels for Nonreflectorized Background:
- 2.9.1 Replacement Metal Panels for sign categories not required to be reflectorized shall have a nonreflectorized background composed of one spray coat of primer and two finish coats of baked enamel.
- 2.9.2 Finish Coats shall be baked alkyd resin enamels meeting Fed. Spec. TT-E-529, Class B, of a composition that affects the finished background surface. When thoroughly dry, the colors shall match those described in the current Highway Blue Color Tolerance Chart, PR Color No. 3, or in Highway Green Color Tolerance Chart, PR Color No. 4, of the Federal Highway Administration.
- 2.9.3 Wood Signs shall have two coats of oil paint complying with Fed. Spec. TT-P-52. Message paint shall be a single coat of oil paint. All colors shall comply with ANSI D6.1E.
- 2.10 Sign Wash Detergent shall comply with ASTM D 3399.
- 3.0 EXECUTION:
- 3.1 Footings for Signs, Posts, and Supports:
- 3.1.1 Backfill Material shall be at or near optimum moisture and neither dry nor saturated. It shall be tamped thoroughly in place.
- 3.1.2 Concrete Footings may be cast in place or precast. Hand mixing of concrete will be permitted where the quantity does not exceed one-half cubic yard.
- 3.2 Erection of Signs and Sign Supports: Sign posts shall be erected vertically. Posts erected in sleeves shall be anchored with sulphur mortar. Mortar shall comply with ASTM C 287. Sign faces shall be positioned to be generally perpendicular to the line-of-sight for the observer. Reflectorized signs shall be inspected at night. If specular reflection is apparent on any sign, its position shall be adjusted by the Contractor to eliminate the condition.
- 3.3 Delineators and Hazard Markers: Delineator posts shall be driven to a depth of 30 inches.
- 3.4 Removal of Existing Signs and Posts:
- 3.4.1 Damaged, Obsolete, or Change of Purpose Signs and Posts shall be removed and delivered to a storage area designated by the Authorized Member Representative. Post hole shall be backfilled, tamped, and made level with the adjacent surface. Disturbed paving, sidewalks, and grassed areas shall be replaced with matching material of same quality and quantity as existing.
- 3.4.2 Signs and Posts to be Replaced shall be removed and replaced by new signs and posts in identical locations. Backfill around post shall be thoroughly compacted to hold posts securely in a vertical position.

**Playing Fields**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of materials for repair and maintenance of playing fields. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
- 2.1 Fills required to bring the sub grade of playing surfaces up to required elevation shall be placed in horizontal layers of not more than 8 inches in loose thickness. The top layer of all fills and excavated areas under the playing surfaces shall be compacted to 95 percent CE 55 maximum density. Each lower layer shall be compacted to at least 90 percent of MIL-STD-621, Method 100,

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- CE 55 maximum density.
- 2.2 Sand-Clay Playing Surfaces shall consist of a stone foundation course, a clay foundation course, a wearing course and, where equipped, a drainage filter course, constructed on the prepared sub grade.
    - 2.2.1 Stone Foundation Course: A layer at least 3 inches thick of 3/4- to 1-1/2 inch crushed stone shall be spread over the sub grade or over the drainage filter course constructed thereon and shall be given preliminary compaction by rolling, followed by a filler consisting of 1/4- to 1/2-inch crushed stone to fill voids in the underlying stone. The stone foundation course shall be compacted to a minimum of 90 percent of CE 55 maximum density.
    - 2.2.2 Clay Foundation Course: Selected inorganic fat clay (CH) shall be evenly spread on the stone foundation course to produce a compacted layer not less than 3 inches thick. The clay layer shall be compacted to a minimum of 90 percent of CE 55 maximum density.
    - 2.2.3 Wearing Course: The approved inorganic clay-silt mixture of approximately 50 percent each of clay and silt shall be screened through a 1/4-inch mesh screen. The wearing course shall be mixed in proportions of 1 part sand to 2 parts clay-silt by volume. The wearing course shall be compacted to at least 90 percent of CE 55 maximum density and shall range from 1 to 1-1/2 inches in thickness.
    - 2.2.4 Drainage Filter Course: The drainage filter course shall consist of a well-graded aggregate course encased in a geotextile material and laid in such a manner to allow water to freely drain from the playing surfaces. The geotextile material shall be a woven or non-woven filter material with a minimum permeability of 0.02 cm/sec. The material shall be resistant to mildew, ridding, insects, rodents, and chemicals normally encountered in a subsurface drainage system.
  - 2.3 Bituminous Concrete Playing Surfaces shall consist of a base course, prime coat, bituminous leveling course, tack coat, surface course, color coating and, where required, a drainage filter course, all constructed on a prepared sub grade. The stabilized-aggregate base course shall be compacted at optimum moisture to at least 95 percent CE 55 maximum density. Marshall stability shall not be less than 500 pounds and the flow shall not be greater than 20/100 inch. The bituminous mixture shall be compacted until the voids in the total mix are reduced to less than 4.0 percent by volume.
    - 2.3.1 Thickness of Courses: Base course shall be 4 inches thick after compaction. Leveling course shall be 1-1/2 inches thick after compaction unless directed otherwise. Surface course shall be 1 inch thick after compaction.
    - 2.3.2 Color Coating and Marking Paint: After curing of the bituminous surface course, the entire playing surface shall be covered with a color coat as required.
  - 2.4 Portland cement Concrete Playing Surfaces:
    - 2.4.1 Aggregate: The nominal aggregate size shall be 1-1/2 inches to No. 4 sieve size and shall conform to ASTM C 33.
    - 2.4.2 Portland cement: The cement shall conform to ASTM C 150, Type IA or IIA; or ASTM C 595, Type IP-A.
    - 2.4.3 Thickness: Horizontal Portland cement concrete playing surfaces shall consist of concrete slabs 4 inches thick.
  - 2.5 Maintenance of Sand-Clay Surfaces: Prior to final acceptance, the Contractor shall make one application of 3/4 pound of calcium chloride per square yard to the sand-clay surface of the entire playing area.
  - 2.6 Portable Outdoor Bleachers:
    - 2.6.1 Bleachers shall be designed to support a uniformly distributed live load of 100 pounds per square foot of gross horizontal projection and a horizontal wind load of 30 lbs/sq ft of gross vertical projection. All seat and foot plank members shall be designed to support not less than 120 pounds per linear foot.
    - 2.6.2 Wood Seating and Walk Boards shall be preservative-treated and painted.
  - 2.7 Steel Basketball Poles: Minimum diameter 3-1/2 inches; galvanized pipe.
  - 2.8 Running Track: Gravel and cinders over stone base; compaction to 90 percent of CE 55 maximum density. One hundred percent by weight of the gravel and cinders shall pass the 3/4-inch screen, and 90 percent of the gravel and cinders shall be retained on the No. 4 screen.
  - 3.0 EXECUTION: (Section not used).

**Recreational Facilities**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of miscellaneous/recreational facilities. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Materials shall be resistant to corrosion and degradation by ultraviolet rays. Hardware and fittings shall be at least as corrosion-resistant as the materials fastened.
    - 2.1.1 Steel Plates, Pipe, Tubing, Sheets, Wire Ropes, Chains, and Miscellaneous Shapes shall be stainless steel or galvanized steel, even if painted or coated with vinyl or other protective finish. All open pipe and tube ends shall have rain caps.
    - 2.1.2 Wood shall be all-heart cedar, cypress, or redwood or shall be treated with a non-toxic preservative. Wood shall not be used where it will be in direct contact with the ground, unless approved by the Authorized Member Representative.
    - 2.1.3 Fiberglass shall be smooth fiberglass-reinforced polyester with gelcoat coating and shall meet the following minimum physical properties: 22,000 psi flexural strength, 15,000 psi tensile strength, and 20,000 psi compressive strength.
    - 2.1.4 Aluminum shall be anodized.
    - 2.1.5 Foundations shall be 3,000 psi compressive strength concrete, reinforced as required. Provide embedded anchorage items as required.
  - 2.2 Playground Equipment, shall include, but not be limited to, see-saws, slides, swings, whirlers, and monkey bars, shall be prefabricated and designed to withstand the anticipated structural loads.
    - 2.2.1 Exposed Surfaces shall be smooth (except where required to be nonslip) seamless, and nonsplintering.
    - 2.2.2 Steps, Platforms, and Other Flat Surfaces Subject to Foot Traffic shall be non-slip, but not abrasive and shall be formed to exclude or drain away water.
    - 2.2.3 Fastening shall be flush, concealed, or otherwise formed or located to prevent injury to children playing on the equipment.
    - 2.2.4 Slides shall have stainless steel sliding surfaces.
  - 2.3 Bike Racks shall be mounted, and sections (if rack is sectional) shall be attached with tamper-proof fasteners.
  - 2.4 Fiberglass Shelters shall be reinforced with steel, aluminum, or wood framework as required. Shelter roof shall be sloped to drain. Fiberglass edges shall be returned so that they are not exposed. Shelters shall be prefabricated and designed to withstand the anticipated live, dead, and wind loads.
  - 2.5 Fire Rings shall be Iron Mountain Forge Model Number 120-X or approved equal.
  - 2.6 Pedestal Grills shall be Iron Mountain Forge Model Number 220-X or approved equal.
  - 2.7 6' Long, Galvanized Frame, Aluminum Top and Seat Picnic Table shall be Iron Mountain Forge Model Number 238-6GA or approved equal.
  - 2.8 6' Long, Galvanized Frame, Vinyl Clad Top and Seat Picnic Table shall be Iron Mountain Forge Model Number 238-6GV or approved equal.
- 3.0 EXECUTION: Recreational facilities shall be installed plumb, aligned, and securely anchored to the ground. Adjust equipment with moving parts until operation is smooth and easy.

**Topsoil**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of topsoil. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Topsoil shall be the existing surface soil stripped and stockpiled on the site.
  - 2.2 pH Adjusters:

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- 2.2.1 Agricultural Limestone shall have a minimum calcium carbonate equivalent of 90 percent.
- 2.2.2 Other Liming Materials shall have a minimum calcium carbonate equivalent of 80 percent.
- 2.2.3 Aluminum Sulfate shall be commercial grade.
- 2.3 Soil Conditioners and Amendments:
  - 2.3.1 Peat shall be a natural product conforming to ASTM D 2607.
  - 2.3.2 Sand shall be clean and free of toxic materials.
  - 2.3.3 Vermiculite shall be horticultural grade and free of any toxic materials.
  - 2.3.4 Rotted Manure shall be unleached stable or cattle manure containing no chemicals or ingredients harmful to plants.
  - 2.3.5 Rotted Sawdust shall be free of chips, stones, sticks, soil, and toxic substances.
  - 2.3.6 Gypsum shall be 90 percent pure and free of any toxic materials.
- 2.4 Fertilizer shall be commercial grade, free flowing, uniform in composition and shall conform to applicable State and Federal regulations. Granular fertilizer shall conform to Fed. Spec. O-F-241, Type I, Level B.
- 2.5 Soil Fumigant shall be 97 percent methyl bromide and 3 percent chloropicrin.
- 2.6 Mulch shall be straw, hay, or fiber mulch applied simultaneously with grass seed and fertilizer.
  - 2.6.1 Straw shall be stalks from oats, wheat, rye, barley, or rice that are free from noxious weeds, mold, or other objectionable material.
  - 2.6.2 Hay shall be native hay, sudan-grass hay, broomsedge hay, or other herbaceous mowings, free from noxious weeds, mold, or other objectionable material.
  - 2.6.3 Wood Cellulose Fiber for use with hydraulic application of grass seed and fertilizer shall consist of specially prepared wood cellulose fiber or a combination of wood cellulose and recycled newsprint fibers.
- 2.7 Asphalt Adhesive for application with straw or hay mulch shall be cutback asphalt conforming to ASTM D 2028, or emulsified asphalt conforming to ASTM D 977.
- 2.8 Herbicide and Pesticide use must comply with all applicable State and Federal laws.
- 3.0 EXECUTION:
  - 3.1 Placing Topsoil: Topsoil shall be distributed uniformly and spread evenly to an average thickness of 3 inches, with a minimum thickness of 2 inches. Soil compacted by construction equipment or soil on compacted cut slopes of grades shall be pulverized to a minimum depth of 2 inches by disking or plowing before applying topsoil.
  - 3.2 Application of Soil Conditioners: All fertilizers, pH adjusters, and soil conditioners shall be incorporated into the soil to a depth of at least 4 inches.
  - 3.3 Application of Soil Amendments: Soil amendments shall be spread uniformly over the soil and thoroughly incorporated into the existing soil to a depth of 8 inches.
  - 3.4 Mulch shall be spread uniformly in a continuous blanket, using 1-1/2 tons per acre.

**Sodding and Seeding**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of seed and sod. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Seed shall be the latest season's crop and shall be delivered in original sealed packages bearing the producer's guaranteed analysis for percentages of mixtures and pure live seed. Seed shall be labeled in conformance with U.S. Department of Agriculture rules and regulations under the Federal Seed Act and applicable state seed laws. Weed seed shall not exceed 1 percent by weight of the total mixture.
  - 2.2 Sod shall be nursery grown, field sod, certified sod, or approved sod as classified in the ASPA Guideline Specifications to Turfgrass Sodding.
  - 2.3 Sprigs shall be healthy living stems, stolons, or rhizomes and attached roots of grass without adhering soil. Sprigs shall include two to three nodes, shall be 4 to 6 inches long, and shall be obtained from approved sources where the sod is heavy and dense. Harvesting and planting operations shall be coordinated to prevent exposure of sprigs to the sun for more than 30 minutes

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before covering and moistening.

2.4 Water shall not contain elements toxic to plant life.

3.0 EXECUTION:

3.1 Preparation: Except on slopes steeper than 2 horizontal to 1 vertical, the soil shall be tilled to a depth of at least 4 inches. On slopes between 2 horizontal to 1 vertical and 1 horizontal to 1 vertical tillage, depths shall be 2 inches. On slopes steeper than 1 horizontal to 1 vertical, no tillage will be permitted.

3.2 Application:

3.2.1 Planting Seasons and Conditions: Planting shall not be done when the ground is frozen, snow covered, or in an unsatisfactory condition for planting.

3.2.2 Seed shall be broadcast uniformly. The seed shall be covered to an average depth of 1/4 inch. •02933

3.2.3 Immediately After Seeding, the entire area shall be firmed with a roller and the soil moistened to a depth of 6 to 8 inches.

3.2.4 Sodding shall be accomplished in accordance with the ASPA Guideline Specifications to Turfgrass Sodding.

3.2.5 When Spot Sodding, the sod shall be cut into plugs 2 inches square or 2 inches in diameter. The individual pieces of sod shall be placed on 12-inch centers and pressed firmly into the soil by foot pressure or by tamping.

3.2.6 After Sod Pieces Have Been Placed in Position, the sodded area shall be rolled or tamped so that air pockets are eliminated.

3.2.7 Water Shall Be Applied to the sodded areas at a rate sufficient to ensure thorough wetting of the soil to a depth of at least 4 inches.

3.2.8 Sprigging: Sprigs shall be planted in such quantity as to provide a minimum of 25 viable sprigs or 108 linear inches of viable sprigs per square yard of areas.

3.2.8.1 Immediately After Sprigging Operations Have Been Completed, the planted area shall be firmed with a cultipacker or a roller.

3.2.8.2 Water Shall Be Applied at the time of sprigging operations wetting the soil to a depth of 4 inches.

3.2.9 Protection of Turfed Areas: Immediately after seeding, sodding, or sprigging, the area shall be protected against traffic or other use by erecting barricades, as required, and approved signs shall be placed at appropriate intervals until final acceptance.

**Landscape Irrigation System**

1.0 DESCRIPTION OF WORK: This specification covers the complete irrigation system including: pipe, tubing, fitting, bubbler and emitter heads, control units, and all appurtenances necessary for an operating system. The system shall be Contractor designed, and installed with Authorized Member Representative approval.

2.0 PRODUCTS:

2.1 Piping and Fittings:

2.1.1 Copper Tubing: ASTM B 88, Type K; solder joint fittings, ASME B16.22 and B16.18 using 95-5 tin antimony solder.

2.1.2 PVC Pipe: ASTM D 1785, PVC 1120, Schedule 40 or 80, or ASTM D 2241, PVC 1120 SDR 21, Class 200; threaded or socket type, solvent cemented.

2.1.3 Polyethylene Pipe: ASTM D 2239, PE3406, SDR 15; insert fittings shall be used with stainless steel clamps.

2.1.4 Tubing for use with drip emitters shall be either polyethylene or polybutylene and shall have a minimum working pressure of 100 psi at 37 C.

2.2 Risers for Pop-up Bubbler Heads shall be of the double-swing joint type.

2.3 Application Devices shall be as specified herein.

2.3.1 Pop-up spray heads shall conform to Fed Spec WW-H-001220, Type II, class as required for the spray pattern needed.

2.3.2 Shrubbery sprinkler heads shall be brass nozzle type with adjustable conical spray coverage for permanent aboveground mounting or riser or pop-ups, height compatible with ground cover.

2.3.3 Bubbler heads shall be of the umbrella type in which the flow is evenly distributed around the

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- perimeter of a flat plate on top of the bubbler. The bubbler shall be so adjustable as to provide half or full circle patterns and operating range of 20 psi to 90 psi. The flow rate shall be adjustable for gallonage and pressure by an easily accessible regulating screw.
- 2.3.4 Drip emitters shall be made of rigid, black, ultraviolet-resistant plastic. Each emitter head shall consist of at least two distinct pieces and be designed for easy and complete disassembly for cleaning. The emitters shall be capable of clog-free operation using water filtered through a 30-mesh screen. Emitters shall be multi-headed and shall be spaced to vary with soil conditions and wetted irrigation area.
- 2.4 Valves:
- 2.4.1 Gate valves less than 3 inches shall conform to MSS SP-80, Type 1, Class 150, with threaded or soldered ends.
- 2.4.2 Gate valves 3 inches and larger shall conform to AWWA C509, with flanged ends.
- 2.4.3 Pressure Reducing Valves: One valve shall be installed with each solenoid control valve. The valves shall be hydraulically operated, pilot operated, globe or angle type, and may be actuated either by diaphragm or piston. Valve bodies shall be bronze and shall conform to MSS SP-80, Type 1, Class 150. Valve stem shall be stainless steel. Valve discs and diaphragms shall be synthetic rubber. Valve seats shall be bronze. Pilot controls shall be bronze with stainless steel working parts.
- 2.4.4 Solenoid control valves shall be heavy-duty, all brass construction suitable for 150 psi working pressure and shall be a globe-type diaphragm valve of normally closed design.
- 2.4.5 Manual drain valves less than 2-1/2 inches shall be MSS SP-80, Type 3, Class 150, with soldered or threaded ends. Manual drain valves 2-1/2 inches and larger shall be MSS SP-85, Type II, Class 250, with threaded or flanged ends.
- 2.4.6 Automatic drain valves shall be brass or plastic, spring-loaded ball drip type, 150 pounds, and threaded ends, designed to close at 6 foot pressure head with positive seal at 3 psi pressure or greater, and be open to drain at less than 3 psi pressure.
- 2.4.7 Reduced pressure principle assemblies, double check valve assemblies, atmospheric (nonpressure) type vacuum breakers, and pressure type vacuum breakers shall be tested, approved, and listed in accordance with FCCHR-01. Backflow preventers with intermediate atmospheric vent shall be in accordance with ASSE 1012. Reduced pressure principle backflow preventers shall be in accordance with ASSE 1013.
- 2.5 Accessories:
- 2.5.1 Valve keys for manually operated valves shall be 1/2 inch diameter by 3 feet long, tee handles and keyed to fit valves.
- 2.5.2 Valve Boxes: Boxes shall be reinforced concrete pipe with cast-iron cover. Plastic valve boxes and covers, 9 in. inside diameter and self-draining, may be used as an option when approved by the Authorized Member Representative and in accordance with ASTM D 638. The word "IRRIGATION" shall be cast on cover.
- 3.0 EXECUTION:
- 3.1 Placing and Laying: Pipe shall not be laid in water or when trench conditions are otherwise unsuitable for the work. Water shall be kept out of the trench until the material in the joints has hardened or until caulking or jointing is completed. When work is not in progress, open ends of pipe, fittings, and valves shall be securely closed so that no substance will enter the pipes or fittings. Pipe ends left for future connections shall be valved, plugged, or capped, and anchored as shown or as directed.
- 3.2 Testing:
- 3.2.1 Hydrostatic Tests: After all new piping and risers are in place and prior to the installation of heads, each control valve shall be opened separately and the system shall be thoroughly flushed. After flushing, risers shall be capped and the entire system shall be subjected to a hydrostatic pressure test for a period of four hours. No testing shall be done until the last joint has had at least 12 hours to set. Leaking joints, cracked or defective pipe or valves shall be cut out and replaced and the complete test repeated until satisfactory results are obtained as approved by the Authorized Member Representative.
- 3.2.2 Operational Test: After the hydrostatic test, heads shall be installed and the system completed and tested to demonstrate functional efficiency. The entire system shall be operated on a normal basis

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for at least one month. Deficiencies such as clogging of emitters shall be corrected by the Contractor.

**Plantings**

- 1.0 DESCRIPTION OF WORK: This specification covers the furnishing and installation of plantings. Products shall match existing materials and/or shall be as directed by the Authorized Member Representative. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.
- 2.0 PRODUCTS:
  - 2.1 Plants:
    - 2.1.1 Plants shall be nursery grown or plantation grown stock conforming to ANSI Z60.1 and shall bear botanical names listed in the publication for Standardized Plant Names.
    - 2.1.2 Planting Stock shall be well-branched and well-formed, sound, vigorous, healthy, and free from disease, sun-scald, windburn, abrasion, and harmful insects or insect eggs and shall have healthy, normal, and unbroken root systems.
    - 2.1.3 Balled and Burlapped Plants and balled and potted plants shall have ball sizes and ratios conforming to ANSI Z60.1.
    - 2.1.4 Bare-Root Plants shall be dug with the root system substantially intact but with the earth carefully removed.
    - 2.1.5 Container Grown Plants shall have sufficient root growth to hold the earth intact when removed from containers but shall not be root bound.
  - 2.2 Inert Membranes:
    - 2.2.1 Polyethylene shall conform to ASTM D 2103 and shall be 4 mils thick and black in color.
    - 2.2.2 Roofing Felt shall conform to ASTM D 250, Type II.
    - 2.2.3 Fiberglass Mat shall be of lime borosilicate glass fibers with an average fiber diameter of 8 to 12 microns and 2- to 4-inch strands of fiber bonded with phenol formaldehyde resin. The mat shall be 100 percent textile glass fiber.
  - 2.3 Granular Fill for Plant Pit and Bed Drainage: Granular fill for filling over excavations and for bedding of pipes shall consist of uniformly graded sand, stone, gravel, or stone screenings free from an excess of soft or unsound particles or other objectionable matter.
  - 2.4 Mulch shall be free from deleterious materials and shall be stored so as to prevent inclusion of foreign materials.
  - 2.5 Trunk Wrapping Material: Tree wrap shall be two thicknesses of crinkled paper cemented together with a layer of bituminous material.
  - 2.6 Guying and Staking Material: Stakes for tree support and ground stakes shall be treated with preservative and sized for their usage. Accessories for guying and staking shall include wire and cable, turnbuckles, eyebolts, and deadmen as the project requires.
  - 2.7 Edging Material for plantings shall be composed of wood, metal, or plastic, as the project requires.
  - 2.8 Antidessicant shall be an emulsion that will provide a film over plant surfaces permeable enough to permit transpiration and will not damage the plant.
  - 2.9 Herbicides and Pesticides used must comply with all applicable state and federal laws and be registered with the U.S. Environmental Protection Agency.
- 3.0 EXECUTION:
  - 3.1 Clearing and Grading: Clearing shall consist of the satisfactory removal and disposal of brush, snags, and rubbish occurring within the area designated.
  - 3.2 Protection of Existing Vegetation: If lawns have been established prior to planting operations, the surrounding turf shall be covered before excavations are made in a manner that will protect turf areas. Existing trees, shrubbery, and beds that are to be preserved shall be barricaded in a manner that will effectively protect them during planting operations.
  - 3.3 Turf Removal: Where planting beds occur in existing turf areas, the turf shall be removed to a depth that will ensure the removal of the entire root system.
  - 3.4 Plant Pits shall be dug to produce vertical sides and flat, uncompacted bottoms.
  - 3.5 Planting Seasons and Conditions: Planting shall be done when the ground is not frozen, snow covered, or in an otherwise unsuitable condition for planting.

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- 3.6 Setting Plants: Balled and burlapped and container-grown plants shall be handled and moved only by the ball or container. Plants shall be set plumb and held in position until sufficient soil has been firmly placed around roots or ball.
- 3.7 Fertilization: After establishment of finished grade around plants, all pit and bed areas shall be topdressed with fertilizer at rates recommended by the manufacturer. Fertilizer shall be applied to existing trees at rates recommended by the manufacturer.
- 3.8 Watering: All watering shall be done in a manner that will provide uniform coverage but will not cause erosion or damage to the finished surface. Sufficient water shall be applied to penetrate the planting bed to a depth of 4 inches.
- 3.9 Wrapping: The trunks of deciduous trees shall be wrapped immediately after planting.
- 3.10 Staking and Guying: Plants 4 to 6 feet tall shall be single staked. Plants over 6 feet tall shall be double staked. Hose chafing guards shall be used where wire would contact the plant.
- 3.11 Pruning: New plant material shall be pruned as required. Trimmings shall be removed from the site. Cuts 1/2 inch in diameter and larger shall be painted with tree wound dressing.
- 3.12 Maintenance During Installation: Maintenance operations shall begin immediately after each plant is planted and shall continue as required until final acceptance.

**DIVISION 33-UTILITIES**

**Site Utility Distribution Piping**

- 1.0 DESCRIPTION OF WORK: This specification covers site utility distribution piping, and/or materials as directed by the Authorized Member Representative.
- 2.0 PRODUCTS:
  - 2.1 Polyvinyl Chloride (PVC) Plastic Piping:
    - 2.1.1 Pipe and Fittings: Pipe, AWWA C900, shall be plain end or gasket bell end, Pressure Class 150 (DR 18) with cast-iron-pipe-equivalent OD. Molecular Oriented (MO) PVC pipe, AWWA C900, shall be plain end or gasket bell end, Pressure Class 150 with cast-iron-pipe-equivalent OD. Fittings shall be gray iron or ductile iron, AWWA C110/A21.10 or AWWA C153/A21.53, and have cement-mortar lining, AWWA C104/A21.4, standard thickness. Fittings with push-on joint ends shall conform to the same requirements as fittings with mechanical-joint ends, except that bell design shall be modified, as approved, for push-on joint suitable for use with PVC plastic pipe specified in this paragraph. Pipe color is to be blue or white.
    - 2.1.2 Joints and Jointing Material: Joints for pipe shall be push-on joints, ASTM D 3139. Joints between pipe and metal fittings, valves, and other accessories shall be compression-type joints/mechanical joints, ASTM D 3139 and AWWA A21.11. Provide each joint connection with an elastomeric gasket suitable for the bell or coupling with which it is to be used. Gaskets for push-on joints for pipe, ASTM F 477. Gaskets for compression-type joints/mechanical joints for joint connections between pipe and metal fittings, valves, and other accessories, AWWA A21.11, for mechanical joints. Mechanically coupled joints using a sleeve-type mechanical coupling, as specified in paragraph entitled "Sleeve-Type Mechanical Couplings," may be used as an optional jointing method in lieu of push-on joints on plain-end PVC plastic pipe, subject to the limitations specified for mechanically coupled joints using a sleeve-type mechanical coupling and to the use of internal stiffeners as specified for compression-type joints in ASTM D 3139. 2.
    - 2.1.3 High Density Polyethylene (HDPE) Plastic Pipe ASTM F-714-Pipe Std.; ASTM D3261 – Fittings Std.; AWWA C-901; 3" – 8" SDR 11.0, 160 psi. HDPE inside diameter shall equal or exceed PVC inside diameter.
    - 2.1.4 Valves, Hydrants, and Other Water Main Accessories: Gate Valves on Buried Piping: AWWA C500, AWWA C509, or UL 262. Unless otherwise specified, valves conforming to: (1) AWWA C500 shall be nonrising stem type with double-disc gates and mechanical-joint ends, (2) AWWA C509 shall be nonrising stem type with mechanical-joint ends, and (3) UL 262 shall be inside-screw type with operating nut, double-disc or split-wedge type gate, designed for a hydraulic working pressure of 150 psi, and shall have mechanical-joint ends. Materials for UL 262 valves shall conform to the reference standards specified in AWWA C500. Valves shall open by counterclockwise rotation of the valve stem. Stuffing boxes shall have O-ring stem seals. Stuffing boxes shall be bolted and

Attachment 1: Specifications for the Work

constructed so as to permit easy removal of parts for repair. In lieu of mechanical-joint ends and push-on joint ends, valves may have special ends for connection to sleeve-type mechanical coupling. Valve ends and gaskets for connection to sleeve-type mechanical coupling shall conform to the applicable requirements specified for the coupling. Provide 6 inch size valves with gearing, AWWA C500. Valves shall be of one manufacturer.

- 2.1.5 Fire Hydrants: Hydrant: AWWA C502, UL 246, dry barrel type, inside dimension of 7 inches (175 mm) minimum, with minimum 5 inches (125 mm) diameter valve seat opening; minimum net water area of barrel not less than 190 percent of valve opening; 6 inch (150 mm) bell or mechanical joint inlet connection with accessories, gland bolts, and gaskets. Hydrant outlets shall have 0.90 discharge coefficients.
- 2.1.6 Hydrant Extensions: Fabricate in multiples of 6 inches (150 mm) with rod and coupling to increase barrel length.
- 2.1.7 Hose and Streamer Connection: Match sizes with utility company, two hose nozzles, one pumper nozzle. Install a Storz connection in place of the 4-1/2" steamer connection.
- 2.1.8 Finish: Primer and two coats of enamel in color to be selected by base.
- 2.1.9 Casing (under roadways): Casing under all paved roads shall meet, at a minimum, the following: a. Wall Thickness: (Steel Casing) All casings shall be 0.188", ASTM A139, Grade B. b. Steel casing shall be coated inside and out with approved primer plus one coat of asphaltum paint on outside. c. All casing as a minimum shall extend 3 feet beyond the edge of roadway surfaces.
- 2.1.10 Casing/Pipe Spacers: The Contractor shall provide casing spacers for all piping routed through steel casing. The spacers shall be stainless steel construction with UHMW polymer runners and shall be in two (2) halves. The nuts and bolts used shall be stainless steel. A total of no less than two (2) spacers per joint of pipe shall also be used plus one (1) near the openings (ends) of the casing. The Contractor shall provide casing end seals on all casings. The end seals shall wrap around the casing and carrier pipes after installation to provide a barrier to backfill debris and seepage. Stainless steel bands shall be used to secure the end seals.
- 2.2 Water Service Line Materials: Plastic Piping - Plastic pipe and fittings shall bear the seal of the National Sanitation Foundation for potable water service. Plastic pipe and fittings shall be supplied from the same manufacturer. Polyvinyl Chloride (PVC) Plastic Piping: ASTM D 1785, Schedule 40; or ASTM D 2241, with SDR as necessary to provide 150 psi minimum pressure rating. Fittings, ASTM D 2466. Pipe and fittings shall be of the same PVC plastic material and shall be one of the following pipe/fitting combinations, as marked on the pipe and fitting, respectively: [PVC 1120/PVC I; PVC 1220/PVC 12;] PVC 2120/PVC II; PVC 2116/PVC II. Solvent cement for jointing, ASTM D 2564.
  - 2.2.1 Insulating Joints - Joints between pipe of dissimilar metals shall have a rubber-gasketed or other suitable approved type of insulating joint or dielectric coupling which will effectively prevent metal-to-metal contact between adjacent sections of piping.
  - 2.2.2 Corporation Stops - Ground key type; bronze, ASTM B 61 or ASTM B 62; and suitable for the working pressure of the system. Ends shall be suitable for solder-joint or flared tube compression type joint. Threaded ends for inlet and outlet of corporation stops, AWWA C800; coupling nut for connection to flared copper tubing, ASME/ANSI B16.26.
  - 2.2.3 Curb Boxes - Provide a curb box for each curb or service stop. Curb boxes shall be of cast iron of a size suitable for the stop on which it is to be used. Provide a round head. Cast the word "WATER" on the lid. Each box shall have a heavy coat of bituminous paint.
- 3.0 EXECUTION:
  - 3.1 Location Of Water Lines: Terminate the work covered by this section at a point approximately 5 feet from the building, unless otherwise indicated. Do not lay water lines in the same trench with gas lines or electric wiring. 1. Water Piping Installation Parallel With Sewer Piping a. Normal Conditions: Lay water piping at least 10 feet horizontally from a sewer or sewer manhole whenever possible. Measure the distance edge-to-edge.
  - 3.2 Unusual Conditions: When local conditions prevent a horizontal separation of 10 feet, the water piping may be laid closer to a sewer or sewer manhole provided that: (1) The bottom (invert) of the water piping shall be at least 18 inches above the top (crown) of the sewer piping. (2) Where this vertical separation cannot be obtained, the sewer piping shall be constructed of AWWA-

Attachment 1: Specifications for the Work

approved water pipe and pressure tested in place without leakage prior to backfilling. (3) The sewer manhole shall be of watertight construction and tested in place.

3.3 Installation of Water Piping Crossing Sewer Piping:

3.3.1 Normal Conditions: Water piping crossing above sewer piping shall be laid to provide a separation of at least 18 inches between the bottom of the water piping and the top of the sewer piping.

3.3.2 Unusual Conditions: When local conditions prevent a vertical separation described above, use the following construction: (1) Sewer piping passing over or under water piping shall be constructed of AWWA-approved ductile iron water piping, pressure tested in place without leakage prior to backfilling. (2) Water piping passing under sewer piping shall, in addition, be protected by providing a vertical separation of at least 18 inches between the bottom of the sewer piping and the top of the water piping; adequate structural support for the sewer piping to prevent excessive deflection of the joints and the settling on and breaking of the water piping; and that the length, minimum 20 feet, of the water piping be centered at the point of the crossing so that joints shall be equidistant and as far as possible from the sewer piping.

3.3.3 Pipe Laying And Jointing: Remove fins and burrs from pipe and fittings. Before placing in position, clean pipe, fittings, valves, and accessories, and maintain in a clean condition. Provide proper facilities for lowering sections of pipe into trenches. Do not under any circumstances drop or dump pipe, fittings, valves, or any other water line material into trenches. Cut pipe accurately to length established at the site and work into place without springing or forcing. Replace by one of the proper length any pipe or fitting that does not allow sufficient space for proper installation of jointing material. Blocking or wedging between bells and spigots will not be permitted. Lay bell-and-spigot pipe with the bell end pointing in the direction of laying. Grade the pipeline in straight lines; avoid the formation of dips and low points. Support pipe at proper elevation and grade. Secure firm, uniform support. Wood support blocking will not be permitted. Lay pipe so that the full length of each section of pipe and each fitting will rest solidly on the pipe bedding; excavate recesses to accommodate bells, joints, and couplings. Provide anchors and supports where indicated and where necessary for fastening work into place. Make proper provision for expansion and contraction of pipelines. Keep trenches free of water until joints have been properly made. At the end of each work day, close open ends of pipe temporarily with wood blocks or bulkheads. Do not lay pipe when conditions of trench or weather prevent installation. Depth of cover over top of pipe shall not be less than 2 1/2 feet. Install access fittings to permit disinfection of water system.

3.3.4 Connections To Existing Water Lines: Make connections to existing water lines after approval is obtained and with a minimum interruption of service on the existing line. Scheduling of any outage requires a minimum of one week prior notice for the user of the facility. Make connections to existing lines under pressure in accordance with the recommended procedures of the manufacturer of the pipe being tapped.

3.3.5 Special Requirements For Installation Of Water Mains

3.3.6 Installation of PVC Plastic Water Main Pipe and Associated Fittings: Make push-on joints with the elastomeric gaskets specified for this type joint, using either elastomeric-gasket bell-end pipe or elastomeric-gasket couplings. For pipe-to-pipe push-on joint connections, use only pipe with push-on joint ends having factory-made bevel; for push-on joint connections to metal fittings, valves, and other accessories, cut spigot end of pipe off square and re-bevel pipe end to a bevel approximately the same as that on ductile-iron pipe used for the same type of joint. Use an approved lubricant recommended by the pipe manufacturer for push-on joints. Make compression-type joints/mechanical joints with the gaskets, glands, bolts, nuts, and internal stiffeners previously specified for this type joint; assemble in accordance with the requirements of AWWA C605 for joining PVC pipe to fittings and accessories, with the applicable requirements of AWWA C600 for joint assembly, and with the recommendations of Appendix A to AWWA C111/A21.11. Cut off spigot end of pipe for compression-type joint/mechanical-joint connections and do not re-bevel. Assemble joints made with sleeve-type mechanical couplings in accordance with the recommendations of the coupling manufacturer using internal stiffeners as previously specified for compression-type joints.

3.3.7 Pipe Anchorage: Provide concrete thrust blocks. Thrust blocks shall be in accordance with the requirements of AWWA C605 for reaction or thrust blocking and plugging of dead ends, except that

Attachment 1: Specifications for the Work

size and positioning of thrust blocks shall be as indicated. Use concrete, ASTM C 94, having a minimum compressive strength of 4,000 psi at 28 days. 3. Install a # 10 gage copper trace wire with buried PVC pipe to facilitate location with an electronic detector. Install wire 8 to 12 inches above pipeline and terminate 3 to 4 inches above grade. Do not wrap wire around pipe. The magnetic detectable conductor must have a brightly colored plastic covering with the "Water Service" imprinted in large letters.

- 3.3.8 Installation of Valves: Make and assemble joints to gate valves as specified for making and assembling the same type joints between pipe and fittings.
- 3.3.9 Installation of Hydrants: Install hydrants in accordance with AWWA C600 for hydrant installation and as indicated. Make and assemble joints as specified for making and assembling the same type joints between pipe and fittings. Install hydrants with the 4 1/2 inch connections facing the adjacent paved surface. If there are two paved adjacent surfaces, contact the Contracting Officer for further instructions.
- 3.3.10 Disinfection - Disinfect new water piping and existing water piping in accordance with AWWA C651 and as required by State permit. Bacteriological samples shall be taken on two consecutive days at the connection to the existing system, the end point of the new addition, on each new line branching off main, and every 1,200 feet on straight runs of pipe.

7/25/2023



**Modification of Contract  
(Contract Extension)  
(Page 1 of 3)**

Robert Carr  
Pueblo Mechanical and Controls, LLC.  
6771 E. Outlook Drive  
Tucson, AZ 85756

**RE: Contract # 19F-PMAC2-0904 modification of contract through an extension of contract is made by, and between, Pueblo Mechanical and Controls, LLC. and Mohave Educational Services Cooperative (Mohave).**

In accordance with its terms and conditions, Mohave requests to extend contract 19F-PMAC2-0904 for a period of one (1) year, beginning 9/4/2023. The extension shall be under the same terms and conditions contained therein.

Provide your agreement to extend by completing the appropriate information below and on the following pages. If the contract is extended, Pueblo Mechanical and Controls, LLC. agrees to provide products or prices as per 19F-0808.

By signing this Modification of Contract, you hereby certify to the best of your knowledge and belief that your firm complies with Byrd Anti-Lobbying Amendment 31 U.S. Code § 1352, 2 CFR § 200.450 and Federal Acquisition Regulation 52.203-11

We agree to **modify** and **extend** the contract as specified above, abiding by the current terms and conditions, and any attached clarifications.

Signature Robert W. Carr Title OSM

Typed/Printed Name ROBERT W. CARR Date 8/8/2023

Upon your signed, executed Modification of Contract through a Contract Extension, you shall be bound to sell the materials and/or services offered to and accepted by Mohave in accordance with the solicitation, including all terms, conditions, specifications, amendments and any accepted written exceptions.

*Nancy D. Colbaugh*

Nancy Colbaugh, CPPB  
Contracts Manager  
Mohave Educational Services Cooperative, Inc.  
625 East Beale Street | Kingman, AZ 86401  
Phone 928-718-3228 | Fax 928-718-3232

**If all pages of this notice are not received at Mohave's Kingman office on, or before, 9/4/2023, orders shall be held without processing. Email or fax completed extension to [contracts@mesc.org](mailto:contracts@mesc.org) or 928-718-3232.**

To terminate the contract effective 9/4/2023, email or fax a notice of your request to cancel the contract to [contracts@mesc.org](mailto:contracts@mesc.org) or 928-718-3232. You agree to complete any authorized work or orders received prior to that date. Renewals not received within 14 days following 9/4/2023 may result in cancellation of the contract. However, any authorized orders received prior to this date, shall be completed under this contracts terms and conditions.

# Modification of Contract (Contract Extension)

(Page 2 of 3)

## Requested Pricing Modifications

We list your contract as utilizing Coefficient applied to UPB, Trade Service (TRA-SER) pricing and some fixed price for professional services.. Please confirm the following regarding pricing under your contract:

Our contract utilized firm-fixed pricing. We agree to hold the current prices until the next contract renewal date of 9/4/2024.

Our contract utilized percentage off MSRP/Retail pricing. The current price lists/catalogs are still applicable.

We are requesting a price modification. A price list/catalog will be submitted by \_\_\_\_\_. (Insert Date)

*Remember that your firm cannot quote any new products contained in pricing submitted with your contract extension until it has been reviewed and a Contract Modification through a pricing update/product addition has been issued. Current contract pricing will remain in effect until this process is complete.*

Please verify that the following information is correct and accurate:

POs Attn: Order Desk  
Pueblo Mechanical and Controls, LLC.  
6771 E. Outlook Drive  
Tucson, AZ 85756

Remit to: Pueblo Mechanical and Controls, LLC.  
Accounts Receivable  
6771 E. Outlook Drive  
Tucson, AZ 85756

Member Contact: Robert Carr  
Contract Administrator: Robert Carr  
Phone Number: 800-840-9170  
Fax Number: 888-473-4374

## **Vendor Logo**

Currently, we have the following logo on file for use on our website in our product/vendor finder:



If you wish to revise or update the logo we have on file, keep the following requirements in mind:

- *What file types are acceptable?* Vector point files are highly recommended (such as .ai or .eps files). If you don't have access to a vector point file, a large hi-resolution (approximately 150-300 dpi) JPEG, TIFF, BITMAP, GIF or PNG file will work. Having a file with a high dpi will help keep images looking sharp if we need to resize the logo.
- *What file size is recommended?* There is no limitation to the logo file size.

# Modification of Contract (Contract Extension)

(Page 3 of 3)

## Vendor Benefits Description

Currently, we have the following information on our website detailing the benefits of your contract for our members to view:

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Pueblo Mechanical and Controls, LLC. is a recognized JOC expert, specializing in full spectrum energy efficient heating, cooling, ventilation, and air conditioning [HVAC] installation and service. Since 2001, having completed over 3,800 projects and thousands of service calls for educational institutions, cities, counties, and various federal and private organizations, state-wide. Procuring our services is simple, secure, and above all, cost effective!

Mohave makes utilizing its approved and trustworthy vendors convenient and statute compliant with guidelines and procedures in place that protect you, the customer. Service is friendly and lightning fast! Inquire about our affordable service contracts and enjoy continued technical and hands-on support for systems of all types and ages.

We proudly service a host of governmental agencies with guaranteed work; we will not rest until the project is done right and worthy of the Mohave membership we serve.

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If you wish to revise or update the vendors benefits information we have on file, keep the following requirements in mind:

- The description should be 150-200 words that explain the benefits that your company can provide to our members through your Mohave contract.
- The description should give a brief overview for members who may be accessing information about your contract from our product vendor finder on Mohave's website.
- Please note that Mohave reserves the right to revise or modify the information provided either for content or length.

**Email or fax request for information revisions or additional information to [contracts@mesc.org](mailto:contracts@mesc.org) or 928-718-3232. If you have any questions, contact your Contract Specialist either via email at [michaelc@mesc.org](mailto:michaelc@mesc.org) or phone 928-718-3222.**



The Due Diligence Tutorial may be downloaded using the following link:

**[Click here to view and download the Due Diligence Tutorial for Mohave Contracts.](#)**

Pricing for this contract may be found at the following link:

**[Click here to go to the Mohave Pricing](#)**

For further assistance contact the Contract Specialist for this contract:

**Michael Carter Specialist, CPPB**

Phone: 928-718-3221

Email: [michael@mesc.org](mailto:michael@mesc.org)

**Price Proposal – Primary Vendor Information**  
**(Place in a clearly marked, separate sealed envelope)**

**IF YOUR FIRM WAS SHORTLISTED FOR DIVISION 22 PLUMBING, DIVISION 23 HEATING, VENTILATION AND AIR CONDITIONING OR DIVISION 26 ELECTRICAL, PROVIDE COEFFICIENTS AND PRICING INFORMATION FOR BOTH DIVISIONS OR INDICATE IF THE COEFFICIENTS WILL BE IDENTICAL FOR BOTH DIVISIONS.**

**Price Proposal shall be submitted in a clearly marked, separate sealed envelope. Offeror shall provide a price proposal to include the following information:**

- 1. Name and Date of the Unit Price Book (UPB):**
- 2. Coefficient(s) to be applied to pre-priced items (items listed in the UPB) for work performed during:**
  - Normal business hours (Monday - Friday 7 a.m. - 5 p.m.)
  - Other hours (after hours, weekends, and holidays)
  - Note adjustments to the coefficient(s), if applicable, for work performed in different regions of the state.
- 3. Coefficient(s) to be applied to non pre-priced items (items not listed in the UPB) for work performed during:**
  - Normal business hours (Monday - Friday 7 a.m. - 5 p.m.)
  - Other hours (after hours, weekends, and holidays)
  - Note adjustments to the coefficient(s), if applicable, for work performed in different regions of the state.

**Notes:** Provide a brief explanation of the rationale for your coefficients. The rationale should indicate how you determined the cost of doing the work and the various elements that made up your coefficients. See Specification 1.2.13, Pricing, for additional information.

**4. Open Book Pricing Workbook:**

**NOTE: *The workbook contains cells that include formulas to calculate total costs. Do not override the formulas within these cells.***

If offeror is including the Open Book Pricing methodology in their price proposal, the Open Book Price workbook shall be completed as follows:

- Provide complete information in the worksheet titled, "*Price Summary*" in the electronic Open Book Price workbook titled, "*19F-0808 Open Book Price Summary.xlsx*" includes yellow highlighted cells for *General and Administrative Cost (G&A)* and *Profit*. Place the percentage value your firm will use to calculate overhead and profit for the Direct Project Costs and General Conditions.
- The worksheet titled, "*General Conditions*" in the electronic Open Book Price workbook titled, "*19F-0808 Open Book Price Summary.xlsx*", includes general conditions, services, or costs not identified or included in the subcontractor quotations.
- Provide the labor and/or service unit price for the yellow highlighted cells in the section titled, *Admin Fee Items: Unit Price*. Additionally, include the unit of measure (e.g. per hour, per day, per week) as applicable in the *Unit Of Measure* column.
- Provide additional costs as applicable for yellow highlighted cells in the section titled, *Non-Admin Fee Items*. Non-Admin Fee items include costs that are "passed-through" to member at cost to the contract vendor. *Mohave shall not collect administration fees on the above non-admin fee items.*
- Add line items to the Admin and/or Non-Admin Fee schedules as necessary.
- **Only services/costs identified in this price schedule will be allowed under an awarded contract.**
- This workbook will serve as your quoting template for all open book projects under an awarded contract.

**Price Proposal – Primary Vendor Information**  
**(Place in a clearly marked, separate sealed envelope)**

**5. Trade Service Price Guides for items and services not included in the UPB:**

- The pricing methodology to determine the Mohave price shall be:
  - Discount off list (specify discount).
  - Discount off Column Two (specify discount) when List Price is unavailable.

**6. Professional Services (Provide the applicable hourly rate for each service offered. No coefficient will be applied to these rates.)**

- Design Services
- Engineering Services
- Other Professional Services (specify service and rate)

**7. Maintenance Services and Extended Warranties (Provide the cost for all maintenance services and extended warranties that are available after the warranty period. No coefficient will be applied to these prices.)**

**8. Other Charges (Provide any additional costs, or incidental charges. Such charges may include the items listed below. No coefficient will be applied to these charges.)**

- 100% Performance and Payment Bonds
- Meals and incidental expenses (M&IE), transportation and lodging
- Mobilization (Indicate when mobilization charges would apply.)

*NOTE: Mobilization may only be used with projects priced using Trade Service and labor. Mobilization charges shall not be allowed with UPB or Open Book Pricing methodologies.*

- Other

**9. Will you offer members a quick pay discount if payment is made within 10 or 20 days? Yes \_\_\_ No X**

- If Yes, what is the discount for 10 days? \_\_\_\_\_ 20 days? \_\_\_\_\_

**Travel Description**

If travel rates are applicable, describe how they are calculated, and when they are necessary, (e.g. 50 miles from origin). Include information regarding what the travel rates cover. (See **Pricing: Reimbursement for Transportation, Mileage, Lodging, Meals and Incidental Expenses** in the Special Terms and Conditions.)

Travel rates are applicable when work sites exceed 50-mile radius from our current Tucson and Phoenix office locations. In some

cases overnight lodging will not be required if it is more cost effective to travel to the work site daily versus overnight stays.

Meals & Incidentals are only applicable for work involving overnight accommodations.

**Bond Methodology Description**

Provide detailed information explaining the methodology to be used when bonds are applied to projects. Describe in detail the method your surety company requires you to use (e.g., bonds are applied before sales tax is applied, bonds are applied after sales tax is applied). Mohave will use this information to verify that your firm is consistently charging bonds in the same manner under an awarded contract.

The use of bonds is based on current state legislation and owners' requirements. Projects under \$100,000 do not require bonding

Unless specifically requested by the owner, all proposals will include this language. Bonding cost is calculated based on the total

price obligation.



**2. Coefficients - Pre-Priced Primary UPB Coefficients [RS Means CostWorks]:**

**APPLIES TO ALL DIVISIONS**

Normal Business Hours [M-F 7am – 5pm]:	.85
Other Hours [Weekends, holidays, etc.]:	.95
Adjustments to the coefficient(s), if applicable for work performed in different regions of the state:	N/A - None

**Professional Services**

Design Services [Mechanical/Electrical]:	\$116.00/hr.
Engineering Services:	\$120.00/hr.
Principal Engineering Services:	\$142.00/hr.

**Other Professional Services**

Drafting [CAD] Design:	\$92.00/hr.
Architect:	\$142.00/hr.
Principal Architect:	\$160.00/hr.

**Maintenance and Other Services [based on hourly labor rates]:**

Duty Position	Normal Hours	After Hours / Emergency Hours	Holidays
HVAC Chiller Tech [Wetside Applications]	\$104.00/hr.	\$142.00/hr.	\$176.00/hr.
HVAC Unitary Tech [Dryside Applications]	\$99.00/hr.	\$136.00/hr.	\$168.00/hr.
Pipefitter / Steamfitter	\$94.00/hr.	\$129.00/hr.	\$159.00/hr.
Sheet Metal Installation	\$74.00/hr.	\$101.00/hr.	\$125.00/hr.
Plumber	\$98.00/hr.	\$134.00/hr.	\$166.00h/hr.
Water Treatment	\$101.00/hr.	N/A	N/A
HVAC Building Automation Tech – Controls/Programing	\$98.00/hr.	\$134.00/hr.	\$166.00/hr.
Project Manager / Quality Control	\$96.00/hr.	\$131.00/hr.	\$163.00/hr.
Electrical [by PMAC]	\$87.00/hr.	\$119.00/hr.	\$147.00/hr.
General Labor	\$50.00/hr.	\$68.00/hr.	\$85.00/hr.

**Note: Labor rates above are all inclusive, no other factors or mark-ups are applied**

**Note: Normal hours are 7:00 am – 5:00 pm Monday – Friday [Excluding holidays]**

**Other Charges**

**3. Coefficients - Custom or Special Non-Prepriced Items Not Found in UPB or TRA-SER [Pricing based on three quotes when available; single source or customer mandated items due to specific specifications are available if they comply with contract requirements]**

Normal Business Hours [M-F 7am – 5pm]: **1.20**  
 Other Hours [Weekends, holidays, etc.]: **1.20**  
 Adjustments to the coefficient(s), if applicable  
 for work performed in different regions of the state: **N/A - None**

**NOTE:** The use of the non-prepriced pricing option will only take place when the equipment/supplies are not listed in primary or secondary costing and include a statement clearly indicating that pricing is not available via other pricing methodologies

**Explanation Notes:** Established coefficients represent the minimum realistic cost estimate to capture direct/indirect costs, overhead, and a sustainable profit. The coefficients represent project cost averages based on project spanning 15 years of UPB utilization.

**4. Open Book Pricing Workbook/Summary:**

**Name of Pricing Source:** 19F-0808 Open Book Price Summary Excel Spreadsheet – Jul 19

**General & Administrative Cost (G&A)** 10%

**Profit** 5%

**General Conditions** Derived from Open Book pricing spreadsheet General Conditions Tab

<b>Duty Position [Direct Company Labor]</b>	<b>Normal Hours</b>	<b>After Hours / Emergency Hours</b>	<b>Holidays</b>
Project General Manager	\$94.00/hr.	\$129.00/hr.	\$159.00/hr.
Project Manager	\$83.00/hr.	\$114.00/hr.	\$141.00/hr.
Estimator	\$77.00/hr.	\$105.00/hr.	\$131.00/hr.
Senior Superintendent	\$77.00/hr.	\$105.00/hr.	\$131.00/hr.
Superintendent	\$72.00/hr.	\$99.00/hr.	\$122.00/hr.
CQC Inspector	\$77.00/hr.	\$105.00/hr.	\$131.00/hr.
Safety Manager	\$83.00/hr.	\$114.00/hr.	\$141.00/hr.

Field Engineer	<b>\$94.00/hr.</b>	<b>\$129.00/hr.</b>	<b>\$159.00/hr.</b>
Administrative Assistant	<b>\$58.00/hr.</b>	<b>\$79.00/hr.</b>	<b>\$98.00/hr.</b>
HVAC Chiller Tech [Wetside Applications]	<b>\$90.00/hr.</b>	<b>\$123.00/hr.</b>	<b>\$153.00/hr.</b>
HVAC Unitary Tech [Dryside Applications]	<b>\$86.00/hr.</b>	<b>\$118.00/hr.</b>	<b>\$146.00/hr.</b>
Pipefitter / Steamfitter	<b>\$82.00/hr.</b>	<b>\$112.00/hr.</b>	<b>\$139.00/hr.</b>
Sheet Metal Installation	<b>\$64.00/hr.</b>	<b>\$88.00/hr.</b>	<b>\$108.00/hr.</b>
Water Treatment	<b>\$88.00/hr.</b>	<b>\$121.00/hr.</b>	<b>\$149.00/hr.</b>
Plumber	<b>\$85.00/hr.</b>	<b>\$116.00/hr.</b>	<b>\$144.00/hr.</b>
Electrical [by PMAC]	<b>\$68.00/hr.</b>	<b>\$93.00/hr.</b>	<b>\$115.00/hr.</b>
HVAC Building Automation Tech – Controls/Programing	<b>\$85.00/hr.</b>	<b>\$116.00/hr.</b>	<b>\$144.00/hr.</b>
General Labor / Driver	<b>\$43.00/hr.</b>	<b>\$59.00/hr.</b>	<b>\$73.00/hr.</b>
In-House Design Services [Mech/Electric]	<b>\$101.00/hr.</b>	<b>\$138.00/hr.</b>	<b>\$171.00/hr.</b>
In-House Drafting [CAD] Design	<b>\$80.00/hr.</b>	<b>\$110.00/hr.</b>	<b>\$136.00/hr.</b>

**See detailed Open Book Breakout Below:**

## 5. Trade Service [TRA-SER] Price Guides/Summary:

**Name/Date of Pricing Source:** TradeService eDataFlex

**Note:** TRA-SER equipment pricing is also available as a stand-alone pricing option

Normal Business Hours [M-F 7am – 5pm]: **.90 [List Price Column]**

Other Hours [Weekends, holidays, etc.]: **.90 [List Price Column]**

Discount off Column Two when List Price not avail. **TBD**

**Note:** Labor rates are listed above in the UPB section; no additional mark-up is applied to these rates

**Note:** TRA-SER pricing may be combined with UPB pricing to provide a complete turn-key solution

## 6. Professional Services:

### Professional Services

Design Services [Mechanical/Electrical]: **\$105.00/hr.**

Principal Engineering Services: **\$130.00/hr.**

### Other Professional Services

Drafting [CAD] Design: **\$83.00/hr.**

Architect: **\$130.00/hr.**

## 7. Maintenance Services and Extended Warranties:

Factory or Misc. Formal Training / Instruction: **Direct Cost**

Maintenance Services **Labor/Materials IAW standard JOC pricing [Trade Service/UPB]**

Extended Warranties [if available through manufacturer and/or vendor] **Direct Cost**

Mohave Solicitation Number RFP 19F-0808

Member	
Project Title	
Project Location	
Date	

**Direct Project Cost**

Division/Specialty	#	Subcontractor	Quote Summary	Quote Amount	Selected Quote
	1				
	2				
	3				
	1				
	2				
	3				
	1				
	2				
	3				
	1				
	2				
	3				
	1				
	2				
	3				
	1				
	2				
	3				
	1				
	2				
	3				
Subtotal 1 (Total Direct Project Cost)					<b>\$0.00</b>

General Conditions (GCs) Adminfeeable  
 General Conditions (GCs) Admin Fee  
 General Conditions (GCs) Total Without Admin Fee

Subtotal 2 (Direct Project Cost + General Conditions) **\$0.00**  
 General & Administrative Cost (G&A) (Enter applicable G&A Percentage) **10.00%** % of Subtotal 2 **\$0.00**  
 Subtotal 3 (Subtotal 2 + G&A) **\$0.00**  
 Profit (Enter applicable profit percentage) **5.00%** % of Subtotal 3 **\$0.00**  
 Subtotal 4 (Subtotal 3 + Profit) **\$0.00**

Total Amount Subject to Mohave Admin Fees (based on costs including O&P) **\$0.00**  
 General Conditions (GCs) (non-adminfeeable) **\$ -**  
 Tax (Enter applicable tax rate) **\$0.00**  
 Bond, if applicable (Enter applicable unit price) **\$0.00**  
 Total Project Cost **\$0.00**

\* Provide vendor name & explanation if low quote is not selected.


**NOTE: The workbook contains cells that include formulas to calculate total costs. Do not override the formulas within these cells.**

This worksheet is for the detailed information and pricing for quotations from subcontractors, and the General and Administrative Cost (G&A) and Profit.

To complete the portion required for your price proposal, place the percentage value your firm will use to calculate overhead and profit for the Direct Project Costs and General Conditions in the yellow highlighted cells.

*This workbook will serve as your quoting template for all open book projects under an awarded contract. After completion of this worksheet, you may delete this textbox in your template.*



## 8. Other Charges – Miscellaneous Pricing:

100% Performance/Payment Bonds:	<b>1.50% of project cost</b>
<b>Note:</b> P/P bonds are calculated based on the <u>total</u> project cost [base price + tax]	
Meals and Incidental Expenses (M&IE):	<b>Per AZ State rates</b>
Transportation and Lodging:	<b>Per AZ State rates</b>
<b>Note:</b> M&IE, travel, and lodging are only applicable outside 50 mile radius of Tucson & Phoenix offices	
Expedited Shipping:	<b>Direct Cost</b>
Factory or Misc. Formal Training / Instruction:	<b>Direct Cost</b>
Credit Card / P Card Fees [when applicable]:	<b>Direct Cost + 1%</b>
Mobilization	<b>No additional charges other than allowed as pre-priced line items in the UPB, Open Book, or TRA-SER</b>
Maintenance Services	<b>Labor/Materials IAW standard JOC pricing</b>
Extended Warranties [if available through manufacturer and/or vendor]	<b>Direct Cost</b>
Permits or other direct construction fees:	<b>Direct Cost</b>
Additional Print Sets or Extra O&M Manuals	<b>Direct Cost</b>
Miscellaneous Admin Fees Not Included Above [E.g. Native American TERO or other tribal fees, etc.]:	<b>Direct Cost</b>

## 9. Quick Pay Discounts:

Will you offer members a quick pay discount if payment is made within 10 or 20 days? Yes \_\_\_\_\_ No **X**

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Bryce Doty, Real Estate Manager  
**Co-Submitter:** Emily Markel  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



---

**TITLE:**

**Consideration and Approval of Contract:** Second Amendment to Contract for Services with TB Real Property Consultants, LLC for property acquisitions necessary for the Rio de Flag Flood Control Capital Project in an amount not to exceed \$150,000.

**STAFF RECOMMENDED ACTION:**

1. Approve Second Amendment to Contract for Services in an amount not to exceed \$150,000 for property acquisitions necessary for the Rio de Flag Flood Control Capital Project; and
2. Authorize the City Manager or designee to execute the necessary documents.

**Executive Summary:**

The City entered into a Contract for Services on October 2, 2023, with TB Real Property Consultants, LLC to help acquire property interests necessary for the Rio de Flag Flood Control Capital Project. The Contractor workload has increased as a result of changes in the Project design. As part of the Second Amendment, the Contract amount will increase from a not-to-exceed \$99,500 to a not-to-exceed \$150,000. Contractor has assisted in closing or placing in escrow 7 of the 17 properties assigned. The contract amount is being increased in order to close out the remaining acquisitions.

**Financial Impact:**

Project Name: Rio de Flag Flood Control Project  
Cost: Up to an additional \$50,000  
Account Number Budgeted: 206-08-385-3236-0  
FY Budgeted Amount: \$20,851,032  
Funding Source: Rio de Flag Flood Control Stormwater Capital Improvements FY 2024-25

**Policy Impact:**

No Impact

**Previous Council Decision or Community Discussion:**

March 5th, 2024: Council approved the first amendment to the contract

**Options and Alternatives to Recommended Action:**

1. Approve Second Amendment (recommended)
2. Do not approve Second Amendment

**Connection to PBB Priorities and Objectives:**

Safe and Healthy Community: Provide public safety  
Sustainable, Innovative Infrastructure: Deliver outstanding services to residents through a healthy, well maintained infrastructure system

**Connection to Regional Plan:**

- Manage watersheds and stormwater to address flooding concerns, water quality, environmental protections, and rainwater harvesting.
- Increase the region's preparedness for extreme climate events.
- Incorporate pedestrian access, trails, and watchable wildlife opportunities into natural watercourses when practical.
- Improve mobility and access throughout the region.
- Increase the availability and use of pedestrian infrastructure, including FUTS, as a critical element of a safe and livable community.

**Connection to Carbon Neutrality Plan:**

- Encourage vibrancy, appropriate density, and attainability in existing neighborhoods, so that more residents live within walking distance of their daily needs.
- Create inclusive networks for walking and biking that are continuous, attractive, safe, comprehensive, and convenient for people of all ages.

**Connection to 10-Year Housing Plan:**

**Create 5.8** Prioritize Capital Improvement Projects that facilitate affordable housing.

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**Attachments:**    TB Real Estate Services Second Amendment



## SECOND AMENDMENT

### CONTRACT FOR SERVICES

#### Real Estate Services:

#### Land Acquisition for the Rio de Flag Flood Control Project

Contract No. 2023-154/TER-2023-089-AG2

This Second Amendment to the Contract for Services dated October 23, 2023 by and between the City of Flagstaff, an Arizona municipal corporation (“City”) and **TB Real Property Consultants, LLC, an Arizona limited liability company** (“Contractor”), as amended by the First Amendment dated March 28, 2024 (together “the Contract”) is made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 2024.

WHEREAS, the Contract requires more work than originally anticipated;

NOW THEREFORE, the parties agree that the Contract, paragraphs 2 and 9 and are hereby amended as follows (deleted text is shown as stricken, and new text is shown as underlined and capitalized text):

2. Compensation: In consideration for the Contractor’s satisfactory performance, City shall pay Contractor pursuant to the fee schedule attached hereto as *Exhibit A*, in a total amount not to exceed ~~\$99,500.00~~ \$150,000.00.
9. Price Adjustment: Any price adjustment must be approved by the City in writing as a formal Contract Amendment. The City Council must approve the price adjustment if the annual contract price exceeds ~~\$99,500.00~~ \$150,000.00 otherwise the City Manager or his designee (the Purchasing Director) shall have authority to approve a price adjustment on behalf of the City.

All other provisions of the Contract shall remain unchanged in full force and effect.

*(Remainder of Page Intentionally Blank)*

IN WITNESS WHEREOF, the Parties have caused this Second Amendment to be executed by their duly authorized representatives as of the date first written above. This Second Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**TB Real Property Consultants. LLC,  
an Arizona limited liability company.**

By: \_\_\_\_\_  
Greg Clifton, City Manager

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

City Clerk

Approved as to form:

City Attorney

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Bryce Doty, Real Estate Manager  
**Co-Submitter:** Emily Markel  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



---

**TITLE:**

**Consideration and Approval of Contract:** Consideration and Approval of Contract: Second Amendment to Contract for Services with Sonoran Land Resources, LLC for property acquisitions necessary for the Rio de Flag Flood Control Capital Project in an amount not to exceed \$150,000.

**STAFF RECOMMENDED ACTION:**

1. Approve Second Amendment to Contract for Services in an amount not to exceed \$150,000 for property acquisitions necessary for the Rio de Flag Flood Control Capital Project; and
2. Authorize the City Manager or designee to execute the necessary documents.

**Executive Summary:**

The City entered into a Contract for Services on October 2, 2023 with Sonoran Land Resources, LLC to help acquire property interests necessary for the Rio de Flag Flood Control Capital Project. The Contractor workload has increased as a result of changes in the Project design. As part of the Second Amendment, the Contract amount will increase from a not-to-exceed \$99,500 to a not-to-exceed \$150,000. Contractor has assisted in closing or placing in escrow 6 of the 16 properties assigned. The contract amount is being increased in order to close out the remaining acquisitions.

**Financial Impact:**

Project Name: Rio de Flag Flood Control Project  
Cost: Up to an additional \$50,000  
Account Number Budgeted: 206-08-385-3236-0  
FY Budgeted Amount: \$20,851,032  
Funding Source: Rio de Flag Flood Control Stormwater Capital Improvements FY 2024-25

**Policy Impact:**

No impact

**Previous Council Decision or Community Discussion:**

March 5th, 2024: Council approved the first amendment to the contract

**Options and Alternatives to Recommended Action:**

1. Approve Second Amendment (recommended)
2. Do not approve Second Amendment

**Connection to PBB Priorities and Objectives:**

Safe and Healthy Community: Provide public safety  
Sustainable, Innovative Infrastructure: Deliver outstanding services to residents through a healthy, well maintained infrastructure system

**Connection to Regional Plan:**

Manage watersheds and stormwater to address flooding concerns, water quality, environmental protections, and rainwater harvesting.

Increase the region's preparedness for extreme climate events.

Incorporate pedestrian access, trails, and watchable wildlife opportunities into natural watercourses when practical.

Improve mobility and access throughout the region.

Increase the availability and use of pedestrian infrastructure, including FUTS, as a critical element of a safe and livable community.

**Connection to Carbon Neutrality Plan:**

Encourage vibrancy, appropriate density, and attainability in existing neighborhoods, so that more residents live within walking distance of their daily needs. Create inclusive networks for walking and biking that are continuous, attractive, safe, comprehensive, and convenient for people of all ages.

**Connection to 10-Year Housing Plan:**

Create 5.8 Prioritize Capital Improvement Projects that facilitate affordable housing

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**Attachments:**    Sonoran Land Resources Second Amendment



## SECOND AMENDMENT

### CONTRACT FOR SERVICES

#### Rio de Flag Flood Control Project Contract No. 2023-155

This Second Amendment (“Second Amendment”) to the Contract for Professional Services (Contract No. 2023-155) dated June 12, 2023, as amended by the First Amendment dated February 1, 2024 (together the “Contract”) is made and entered into this \_\_\_\_\_ day of \_\_\_\_\_ 2024, by and between the City of Flagstaff, an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona 86001, and **Sonoran Land Resources, LLC, an Arizona limited liability company.**

WHEREAS, the Contract requires more work than initially anticipated;

NOW, THEREFORE, the parties agree that the Contract, paragraphs 2 and 9 are hereby amended as follows (deleted text is shown as stricken, and next text is underlined and capitalized):

2. ~~First Price Adjustment:~~ COMPENSATION. Contractor shall be paid up to ~~One Hundred Thousand Dollars (\$100,000.00)~~ (“\$150,000.00”) for satisfactory performance of the services pursuant to the fee schedule attached to this first amendment as *Exhibit A*.
9. Price Adjustment: Any price adjustment must be approved by the City in writing as a formal Contract Amendment. The City Council must approve the price adjustment if the annual contract price exceeds \$150,000.00 ~~\$99,500.00~~; otherwise the City Manager or his designee (the Purchasing Director) shall have authority to approve a price adjustment on behalf of the City.

All other provisions of the Contract shall remain unchanged in full force and effect.

*(Remainder of Page Intentionally Blank)*

IN WITNESS WHEREOF, the Parties have caused this Second Amendment to be executed by their duly authorized representatives as of the date first written above. This Second Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

City of Flagstaff

Sonoran Land Resources, LLC, an  
Arizona limited liability company

By: \_\_\_\_\_  
Greg Clifton, City Manager

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_  
City Clerk

\_\_\_\_\_  
City Attorney

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Brian Huntzinger, Water Production Manager  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



---

**TITLE:**

**Consideration and Approval of Contract:** Contract for the Purchase of Materials/Services with Empire Pump Corp. in an amount not to exceed \$650,000, annually, for Utilities Well and Pump Maintenance.

**STAFF RECOMMENDED ACTION:**

1. Approve the Contract for the Purchase of Materials/Services with Empire Pump Corp. in an amount not to exceed \$650,000, annually, for Utilities Well and Pump Maintenance; and
2. Authorize the City Manager to execute the necessary documents.

**Executive Summary:**

The City of Flagstaff, Water Services Division, operates water treatment and distribution facilities including well fields and booster stations. The purpose of establishing the Contract is to provide maintenance and repair of the pumps, motors, wells and other equipment associated with water production, treatment and distribution. The work covered under the Contract is for the removal and replacement of groundwater submersible pumps, motors, column pipe, and line shaft pumps, water treatment pumps and motors, related electrical work, and any other work related to maintaining, cleaning, repairing and testing wells, pumps and motors on an as-needed basis.

The budgeted amount for this contract is \$650,000, annually, for the term of the Contract. The Invitation for Bids advertised a large list of needs that City staff identified to perform the routine maintenance on City well pumps. Empire Pump Corp. submitted a bid with a total catalog value of \$953,450 for all of the items that City staff identified and was deemed the lowest responsible and responsive bidder. During the term of the Contract, City staff will evaluate and order the necessary materials and maintenance services to meet the City's needs within that \$650,000, annual budget.

**Financial Impact:**

The Water Production Section annually budgets based on the number of wells in service, the age of wells, etc. under accounts 202-08-301-1020-0-4229 (Local Wells) for \$252,800, 202-08-301-1021-0-4229 (Lake Mary Wells) for \$103,000, 202-08-301-1022-0-4229 (Woody Mountain Wells) for \$222,593 to cover the costs associated with maintaining the City of Flagstaff's groundwater wells, booster stations and related infrastructure. This Contract may also be utilized by Water Reclamation Facilities (under accounts 203-08-311-1112-0-4229, 203-08-312-1122-0-4229 and 204-08-321-1203-0-4229) for a total of \$171,500 and Water Services Engineering and Project Management.

**Policy Impact:**

This Contract ensures the potable water supply for the City is at maximum capacity at all times and the infrastructure is maintained.

**Previous Council Decision or Community Discussion:**

Similar contracts have been done since 1992. The last contract was approved in March of 2019.

## **Options and Alternatives to Recommended Action:**

1. Approve the Contract for the Purchase of Materials/Services with Empire Pump Corp. in an amount not to exceed \$650,000, annually, for Utilities Well and Pump Maintenance; or
2. Reject all bids for the Utilities Well and Pump Maintenance needs and require each task, job or project to be bid separately. City staff does not recommend this option as it would add significant time maintaining the City's potable water supplies.

## **Background and History:**

The City of Flagstaff, Water Services Division, operates water production, treatment and distribution facilities including well fields, booster stations and treatment plants. In order to service the City of Flagstaff groundwater wells a company needs to have the necessary equipment, licenses, bonds, and professional skills in order to do so as there is the possibility of multiple wells needing maintenance at the same time. Due to potential high water demand in summer months and approximately only two (2) days of peak demand volume in system storage, timing is critical for the maintenance and repair of water production infrastructure. The purpose of establishing the Contract with a qualified contractor is to provide maintenance and repair of the pumps, motors, wells and other equipment associated with water production. The work covered under this contract is for the removal and replacement of groundwater submersible pumps, line shaft pumps, motors, column pipe, water treatment and booster related pumps and motors, related electrical work, and any other work related to maintaining, cleaning, repairing and testing groundwater wells, treatment plants and booster stations on an as-needed basis.

On April 9, 2024, the Purchasing Section posted and Invitation for Bids on the Planet Bids website and advertised the solicitation in the Arizona Daily Sun newspaper. There were five (5) bids that were received for the Utilities Well and Pump Maintenance solicitation with Empire Pump Corp. deemed the lowest responsible and responsive bidder. The initial Contract is for two (2) years with the option to renew for three (3) additional one (1) year periods upon mutual agreement of the City and Empire Pump Corp.

## **Connection to PBB Priorities and Objectives:**

1. Safe & Healthy Community
2. Sustainable and Innovative Infrastructure: Deliver outstanding services to residents through a healthy, well-maintained infrastructure system.

## **Connection to Regional Plan:**

Policy WR.2.2: Maintain and develop facilities to provide reliable, safe, and costeffective water, wastewater, and reclaimed water services.

## **Connection to Carbon Neutrality Plan:**

1. CR-1: Strengthen existing community systems to create resilience to both short-term shocks and long-term change.
2. WS-1: Improve water infrastructure and expand water reuse.

## **Connection to 10-Year Housing Plan:**

None.

## **Connection to Division Specific Plan:**

1. Objective 5: Accelerate Infrastructure Maintenance and Replacement
  2. Objective 6: Ensure Adequate Water Resources and Plan for Climate Change
  3. Objective 7: Maintain Excellent Water Quality
-

**Attachments:** [2024-106 Well Pump Contract - Empire](#)

## CONTRACT FOR PURCHASE OF MATERIALS/SERVICES

Contract No. 2024-106

This Contract is entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff, a political subdivision of the State of Arizona ("City"), and Empire Pump Corp., an Arizona Corporation ("Contractor").

WHEREAS the City desires to receive, and Contractor is able to provide materials and/or services;

NOW THEREFORE, in consideration for the mutual promises contained herein, the Parties agree:

1. Scope of Work: Contractor shall provide the materials and/or services generally described as follows:

### Utilities Well and Pump Maintenance

and as more specifically described in the Scope of Work attached hereto as Exhibit A.1.

2. Compensation: City will pay Contractor for satisfactory performance of the Contract in an amount not to exceed **six hundred fifty thousand dollars and no cents (\$650,000), annually, for the term of the Contract**, including fees and taxes, made in accordance with the Bid Schedule attached hereto as Exhibit A.2. Any price adjustment must be approved by mutual written consent of the parties through a formal amendment. The City Manager or his/her designee (the Purchasing Director) may approve an amendment if the total amount of the contract as amended is less than \$100,000; otherwise, City Council approval is required.
3. Standard Terms and Conditions: The City of Flagstaff Standard Terms and Conditions, attached hereto as Exhibit B are incorporated by reference and shall apply to performance of this Contract, except to the extent modified in Exhibits A.1 or A.2.
4. Insurance: Contractor shall meet insurance requirements of the City, attached hereto as Exhibit C.
5. Contract Term: The Contract term is for a period of three (3) years unless terminated pursuant to the Standard Terms and Conditions. The Contract will be effective as of the date signed by both parties. Performance shall commence within ten (10) days from the City's issuance of the Notice to Proceed.
6. Renewal: The Contract may be renewed for up to two (2) additional one-(1) year terms by mutual written consent of the parties. The City Manager or his designee (the Purchasing Director) shall have authority to approve renewal on behalf of the City.
7. Extension or Renewal for Procurement: The City may unilaterally extend or renew this Contract for up to four (4) additional ninety-day terms to allow for procurement processes upon the completion of the term of the Contract. The City Manager or his designee (the Purchasing Director) shall have authority to approve extension on behalf of the City.

8. Notice: Any formal notice required under this Contract shall be in writing and sent by certified mail and email as follows:

To the City:  
Teddy Callan  
Procurement Specialist  
City of Flagstaff  
211 W. Aspen Ave.  
Flagstaff, AZ 86001  
[emarkel@flagstaffaz.gov](mailto:emarkel@flagstaffaz.gov)

To Contractor:  
JoDee Turner  
Office Manager  
Empire Pump Corp.  
2849 S 49th Ave  
Phoenix, AZ 85043  
jodee@empirepumpcorp.com

With a copy to:  
Brian Huntzinger  
Water Production Manager  
City of Flagstaff  
211 W. Aspen Ave.  
Flagstaff, Arizona 86001  
[BHuntzinger@flagstaffaz.gov](mailto:BHuntzinger@flagstaffaz.gov)

9. Authority: Each party warrants that it has authority to enter into this Contract and perform its obligations hereunder, and that it has taken all actions necessary to enter into this Contract.

CONTRACTOR:

By: \_\_\_\_\_

Title: \_\_\_\_\_

CITY OF FLAGSTAFF

By: \_\_\_\_\_

Title: \_\_\_\_\_

ATTEST:

\_\_\_\_\_  
City Clerk

APPROVED AS TO FORM:

\_\_\_\_\_  
City Attorney's Office  
Notice to Proceed issued: \_\_\_\_\_, 20\_\_

## **EXHIBIT A.1**

### **SCOPE OF WORK**

**OVERVIEW:** The City of Flagstaff, Arizona operates water processing, treatment and distribution facilities, including well fields. The purpose of this bid is to establish a contract with a qualified Contractor for maintenance and repair of the pumps, motors, and other equipment associated with the water processing, wastewater processing, and distribution process throughout the City of Flagstaff.

The bid is organized into bid schedules, which have similar equipment grouped together. Bid schedules 1-6 apply to Lake Mary Water Treatment Facility and associated potable water production locations, bid schedule 7 refers to the Rio de Flag Reclamation Facility and bid schedule 8 refers to the Wildcat Hill Wastewater Treatment Facility. The bid will be evaluated and awarded in the following manner – bid schedules 1-6 (Lake Mary) is one group; bid schedule 7 and 8 (Rio de Flag Wildcat Hill) is the second group.

**SCOPE OF WORK:** The work covered under this contract is for the removal and replacement of submersible pumps, motors, column pipe and line shaft pumps, water treatment pumps and motors, and related electrical work, on an as needed basis. Each bid schedule has data for each well, pump and motor covered under this contract and is attached for proposing and informational purposes.

**DESCRIPTION OF WORK:** The following items are the minimum requirements of performing the scope of work and are not to be construed to mean limits of the work required. The work may be minimized or expanded depending on the method the Contractor chooses to perform the scope of work.

1. Mobilization and demobilization to pull the pump and to set the pump.
2. Electrical work: The contractor shall disconnect the source power to the well; disconnect power cables from the switch gear, pull electrical cable from conduit as required, take precautions when handling electrical or power cable so as not to damage protective coatings or wire, disconnect motor leads, and/or splice motor leads. The Contractor shall connect the source power to the well; band submersible cable with stainless steel bands every twenty (20) feet, run cable through conduit, make appropriate electrical connections, set, and balance power phases for efficient pump operations. Load protection devices are installed on all wells except those located in the Inner Basin well field.
3. Mechanical and Plumbing: The Contractor shall disconnect all pipe fittings, air lines, oil lines, and discharge heads that are required to be taken apart and removed to pull the pump and motor. At some locations, it will be necessary to remove and replace a removable building, hatch or other structure. Many of these structures have connection eyes on the roof to connect a cable harness to simplify the structure removal. All mechanical and plumbing items removed will be replaced in a workmanlike manner that will result in as good or better installation found prior to the dismantling.
4. Pumps and Motors: The Contractor will pull and deliver to the appropriate City of Flagstaff Water Treatment Facilities all submersible pumps and motors and all line shaft motors and/or pumps unless other arrangements are agreed upon for storage or repair. The deliveries to the City of Flagstaff Water Treatment Facilities will be made during normal

operating hours, Monday through Friday only. The Contractor shall notify the Facility Manager two working days prior to delivery.

LOCATIONS: The well field locations are within a 15-mile radius of Flagstaff City Hall.

1. The Inner Basin well field is approximately 11.5 miles north.
2. The Woody Mountain well field is approximately 6.5 miles southwest.
3. The Lake Mary well field is approximately 8.5 miles southeast.
4. The Wildcat Hill Wastewater Treatment Facility is at 2800 North El Paso Road, telephone number 928.213-2425.
5. The Rio de Flag Reclamation Facility is at 600 Babbitt Way, telephone number 928.213-2414.
6. The Lake Mary Water Treatment Facility is at 4500 South Lake Mary Road, telephone number 928.774.0262.

These facilities are on City maintained streets.

ACCESS TO SITES: City crews will maintain road and site access to all Woody Mountain and Lake Mary well fields during the progress of the work, except in the most severe weather conditions. Inner Basin wells will not be worked on during the winter season (November through May). Road and site access will be maintained to the Inner Basin wells by City crews during the period(s) the Contractor is requested to work on the wells except in periods of severe weather. The City will have an employee on hand to monitor the progress of the work.

#### CONTRACTOR RESPONSIBILITIES:

The Contractor will:

1. Provide all labor, equipment, materials, tools, expertise, and incidentals to perform the scope of work.
2. Safeguard all City equipment at all locations including all wells in related wellfields such as, but not limited to, electrical cables, air lines, oil lines, fittings, pumps, motors and protecting water filled motors from freezing. Some equipment items may be turned over to the City at the Lake Mary Water Treatment Plant (LMWTP) for storage during the time the pump is out of the well hole or storage is essential. While in storage at the LMWTP the Contractor will not be liable for the equipment and/or materials.
3. The Contractor is fully responsible for the protection and security of the water quality and integrity of the well during the period of time the pump is out of the well hole.

SPECIAL ITEMS: Special items under this section refer to materials and services not included within the bid schedules, but which may be necessary for the Contractor to provide.

Examples of items include, but are not limited to:

- “Test pumping” equipment such as generators, variable frequency drives, flowmeters, temporary piping and pipelines.
- Discharge assemblies
- Pitless adapters
- Sounding tubes
- Water delivery: pipe, adaptors, fittings.
- Motor repairs
- Motor replacements (new and/or rebuilt)
- Steel building
- Column pipe
- Bowl assemblies
- Pump replacement (new and/or rebuilt)
- Shaft and tubing
- Bearings
- Check valves
- Electric cables
- Electric controls
- Stainless steel bands
- Well and pump modification
- General excavation, drainage work and trenching
- Well rehabilitation/workover
- Dust control
- Motor control centers/switchgear/transformers
- Load protection devices
- Lightning protection equipment
- Electric panels, and lighting circuits
- Compressors
- Crane

The Contractor will be compensated for such services at a percentage markup of the cost the Contractor pays for the item or service (wholesale price). State the markup percentage: actual invoices must be submitted with billing in order for invoices to be paid.

All special item purchases must be approved, in writing, by the City’s Water Production Manager prior to any purchases being made.

#### RIGHTS AND OBLIGATIONS OF CITY:

1. City's Water Production Manager: The City's Water Production Manager, who shall be empowered to act for the City in accordance with the provisions of this contract where such acts are not contrary to law of City ordinances, shall be the Flagstaff Water Services Director or his designee. The City's Water Production Manager will audit the billings, approve payments, oversee schedules, and generally be responsible for overseeing the execution of this contract. Changes in the contract may be made only with the approval of the Flagstaff City Council in advance of said change.
2. Inspection: Inspectors may be stationed on the worksite to report to the Water Production Manager as to the progress of the work, the manner in which it is being performed and to report whenever it appears that materials furnished, and work performed by the Contractor fails to fulfill the requirements of this contract. The inspector may direct the attention of the Contractor to such failure or infringement, but such inspection shall not relieve the Contractor from any obligation to furnish acceptable materials or to provide completed work that is satisfactory.
3. The Contractor shall properly guard and protect all finished or partially finished work and shall be responsible for the same until the work is completed and accepted by the City's Water Production Manager.

#### RIGHTS AND OBLIGATIONS OF THE CONTRACTOR:

1. Contractor's Licenses: Each proposer shall state his/her Arizona Commercial State Contractor's License Number and Classification as evidence that he/she is qualified to contract the work as indicated in the specifications. Each Contractor is required to have a commercial license issued by the State of Arizona Registrar of Contractors regardless of their location.
2. Authorization to Proceed: Specific authorization to proceed with the services described in "Well Maintenance Specifications" and Schedules shall be as follows:
3. Authorization to proceed shall be by a telephone call from the City's Project Manager or designee confirmed in writing (Task Order). For special services, the Contractor shall include a description of the work to be Performed and the schedule for commencing and completing the work.
4. Response Time: After authorization to proceed has been provided to the Contractor by the City in the above-described manner, the Contractor shall respond with manpower, equipment and materials to the area requested within the following time frames:
  - A. Routine/Scheduled: When non-emergency services are called for by the City, the Contractor shall respond within fourteen (14) calendar days after the City's written notification of the need for the non-emergency services.
  - B. Urgent/Critical: When emergency services are called for by the City, the Contractor shall respond with the most available rig or equipment required, within three (3) calendar days after the City's written notification of the need for emergency services.

5. Time is of the essence in the performance of this contract, and failure to respond within the specified response times shall be considered a breach of the contract and may constitute grounds for the immediate termination of this contract. It shall also be the basis for disallowance of the mobilization and/or demobilization compensation.
6. The Contractor is employed to render specialized service only, and any payment made is compensation solely for those services rendered. Contractor shall follow the practice its trade or profession in providing such service.

**EXHIBIT A.2**  
**BID SCHEDULE**

**Schedule 1**  
**Submersible Pumps/Motors**  
**Specifications**

Well Name:	Woody Mountain Well #1	Woody mountain Well #2	Woody Mountain Well #3	Woody Mountain Well #4	Woody Mountain Well #5	Woody Mountain Well #6	Woody Mountain Well #7	Woody Mountain Well #9	Woody Mountain Well #10	Woody Mountain Well #11
Date	2001	2006	2022	2018	2019	2022	2009	2013	2017	2004
Casing Size and Depth	12"/1600'	12"/1600'	20"/1856'	14" liner/2048'	12"/1600'	20"/1700'	14" w/10" liner/1782'	12.75"/1840'	16"/1804'	12"/1950'
<b>A: Motor</b>	ESP	Centrilift	Baker Hughes MSP1	Centrilift	Centrilift	Centrilift	Centerlift KMHG	Centrilift KMHG	Centrilift XP	Centerlift
1. Horsepower	150	152	294	200	161	175	304	304	150	185
2. Estimated Weight	2525 lbs	2525 lbs	3000 lbs	2500 lbs	1300 lbs	3273 lbs	3000 lbs	3000 lbs	2500 lbs	2900 lbs
3. Voltage	2300	2300	2300	2300	2300	2300	2300	2300	2420	2300
<b>B. Pump</b>	ESP TJ 9000, 17 stage	Centrilift	Centrilift HC20000 (19 stages)	Centrilift HC12500 (18 stages)	Centrilift HC16000 (14 stages)	Centrilift HC12500 (18 stages)	Centrilift HC20000 (18 stage)	Centrilift HC20000 (19 stages)	Centrilift HC7800 ARC (19 stages)	Centerlift HC12500 (18 stage)
1. Estimated Weight	850 lbs	850 lbs	1500 lbs	1000 lbs	4000 lbs	41817 lbs	1500 lbs	1450 lbs	1000 lbs	1500 lbs
<b>C. Column</b>	5 1/2", 8 RND	4.5", 8 RD	7", 8 RD	6 5/8", 8 RND	6 5/8"	6"	6 5/8", 8 RD	6 5/8", 8 RD, 47 joints	6 5/8" 8 rnd	6 5/8"m 8 RND
1. Average Length	30'	20'	20'	20' & 30'	20'	20', (1) 30'	30'	30'	20', 73 joints + 51/2" sub	30'
2. Total Length	1517'	1384'	1315'	1412'	1400'		1470'	1509.9	1470'	1503'
3. Estimated Weight	30,400 lbs	30,400 lbs	49,000 lbs	45,000 lbs	32,000 lbs	33,960 lbs	49,000 lbs	49,000 lbs	30,000 lbs	30,000 lbs
<b>D. Airline/Size</b>	3/4 inch by 21 feet	1 in. x 21 feet	1" x 21' galvanized	1" x 21' galvanized	1" x 21' galvanized	1" x 21' galvanized	2" Sounder tube in annulus			
<b>E. Cable/Wire</b>	#2-3C	5KV	#2-3C, 5KV w/grnd, round	5KV (brand rex) 1550 ft	#2-3C	#10	#2-3c, round	#2-3c, round	#4 sol, round	#2-3c, 5KV w/grnd, round
<b>F. Check Valve</b>	5" Slow Flow	4.5 Slow Flow	8" slow flow	6" Slow Flow, 7 joints above	(2) 6"	Flappers @ 560', 1100'	(1) 6 5/8" od	(1) 6"	6"	5 1/2" slow flow

1. Location		20' above pump	2 joints above the pump		100', 600' above pump	1	1 joint above pump	1 joint above pump	(unknown)	1 joint above pump
<b>G. Special Conditions/Considerations</b>	Pitless Adapter	Pitless Adapter, 16" width 12" line	Shroud below the motor. It is five joints of perforated stainless steel.	Shroud has 5 20 ft. joints below pump (more detail on ESP Run)		18 inch liner, 0-793 ft, 20 inch casing to 1700 ft.	Pitless adapter, model #4-ps-14-16-w-b-w-e-f-8.	Well is in a removable bldg. 12' x 12' Contractor is required to remove and replace	There is a motor shroud, 9 1/2" x 42.6"	Pitless adapter

**Additional Information:**

**1. Downhole camera with side view lens:**

\*Must have capability for 2048' depth

Brush/Swab/Bail, any combination of these

**2. Well Workover:**

Brush/Swab/Bail, any combination of these.

- a. Cost to Mobilize/Demobilize
- b. Equipment price per 100 hrs
- c. Total labor per 100 hrs

**Bid Schedule 1 Submersible**

**Pumps/Motors** 20 Foot

**ENTER PRICING IN THE YELLOW-SHADED AREA BELOW**

Column

	Woody Mountain Well #1	Woody mountain Well #2	Woody Mountain Well #3	Woody Mountain Well #4	Woody Mountain Well #5	Woody Mountain Well #6	Woody Mountain Well #7	Woody Mountain Well #9	Woody Mountain Well #10	Woody Mountain Well #11
<b>COSTS:</b>										
<b>A: Motor Only:</b>										
1. Mobilizatio	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00
2. Pull	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
3. Install	4,896.00	5,976.00	5,976.00	5,256.00	5,976.00	6,516.00	4,896.00	4,896.00	5,976.00	4,896.00
4. Demobilizatio	6,336.00	7,416.00	7,416.00	5,496.00	7,416.00	7,956.00	6,336.00	6,336.00	7,416.00	6,336.00
5. Special Conditions	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00
<b>TOTAL COST:</b>	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
	14,232.00	16,392.00	16,392.00	13,752.00	16,392.00	17,472.00	14,232.00	14,232.00	16,392.00	14,232.00

\$ 153,720.00 TOTAL FOR A: MOTOR ONLY

	Woody Mountain Well #1	Woody mountain Well #2	Woody Mountain Well #3	Woody Mountain Well #4	Woody Mountain Well #5	Woody Mountain Well #6	Woody Mountain Well #7	Woody Mountain Well #9	Woody Mountain Well #10	Woody Mountain Well #11
<b>B. Pump and Motor:</b>										
1. Mobilizatio										
2. Pull Pump/Motor										
3. Install Pump/Motor										
4. Demobilizatio										
5. Special Conditions										
<b>TOTAL COST:</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

\$ - TOTAL FOR B: PUMP AND MOTOR

**Additional Information:**

1. Downhole camera with side view lens.

\*Must have capability for 2048' depth

Brush/Swab/Bail, any combination of these.

<b>\$ Price Per Well:</b>	\$ 1,800.00
---------------------------	-------------

\$ 153,720.00 ENTER THIS AMOUNT INTO PLANET BIDS AS LINE ITEM #1

**2. Well Workover:**

Brush/Swab/Bail, any combination of these.

a. Mobilize/Demobilize:	\$ 3,000.00
b. Equipment price per 100 hrs:	\$ 21,600.00
c. Total labor per 100 hrs:	\$ 10,200.00
<b>\$ Total cost for 100 hr workover:</b>	\$ 34,800.00

<b>Schedule 2</b>							
<b>Submersible Pumps/Motors</b>							
<b>Specifications</b>							
<b>Well Name:</b>	<b>Lake Mary Well #1</b>	<b>Lake Mary Well #2</b>	<b>Lake Mary Well #4</b>	<b>Lake Mary Well #5</b>	<b>Lake Mary Well #7</b>	<b>Lake Mary Well 8</b>	<b>Lake Mary Well #9</b>
Date	2002	2008	2008	2002	2007	2016	2009
Casing Size and Depth	13 3/8" liner	20"/1091'	20"/1345'	20"/1336'	10"/1573'	20"/1296'	18"/1400'
<b>A: Motor</b>	Hitachi	Byron-Jacoo Byron-Jackson sn	Centrilift 7 5/8"	US Motors	REDA	US Motors	Centerlift
1. Horsepower	60	125	161	150	150	400	69
2. Estimated Weight	200 lbs	3000 lbs	3500 lbs	700 lbs	200 lbs	4000 lbs	2000 lbs
3. Voltage	480	2300, 30FLA	2300	480V	2300	440V VFD	480
<b>B. Pump</b>	Goulds, 8RAHC, 8 Stage	Rebuilt B-J/Flowsolve, 13LQ (15 stages) sn 99 RW 0049001	Centrilift installed Dec/2008, 15 stage	SIMFLOW, SC10C, 14 STAGE	REDA JN 10000, 5 stage	Aurora, 8 STG, Model 14RM	Centrilift model P75 18 Stage
1. Estimated Weight	550 lbs	3000 lbs	2000 lbs		550 lbs		
<b>C. Column</b>	5 1/2", 8 RND	8 5/8", V-thread	5 1/2" 8 RND thread	8" butt	5 1/2 inch OD 8 rnd	12"	4.5"OD 8rnd
2. Average Length	30'	20'	20'	20'	30'	20'	
3. Total Length	917'	924'	916'	884'	1450'	900'	860'
4. Estimated Weight	20,500 lbs	35,000 lbs	28,800 lbs	2,000 lbs		7,690 lbs	20,000 lbs
<b>D. Airline/Size</b>	1"x 21' Galv. Steel	1"x 21' Galv. Steel	1"x 21' PVC	1"x 21' Galv steel	1/4" airline	1"x 21' Galv Steel	1"x 21' PVC
<b>E. Cable/Wire</b>		#4-3c	#2-3c		#6		#2
<b>F. Check Valve</b>		8"	5 1/2" check				
1. Location	(1) in pump	40 feet	1st joint above pump	20 feet	20 feet	20 feet	20 feet
<b>H. Special Conditions/Considerations</b>	Pitless Adapter, motor shroud, 4" taper discharge on pump, adapter to fit 8" motor	Well is in pit w/removable cover. I-beams may be required to set elevators or spiders. Casing at surface is 20".	Chain link fence around well site will need to be removed and replaced.	Top drive/ shaft driven pump. Well is in removable bldg. 10'x 10'. Contractor is required to remove and replace the bldg. Conestrainer	No shroud, 4" flanged 90	Top drive/ shaft driven pump. Well is in 12'x 12' removable bldg. Contractor is required to remove and replace the bldg. Conestrainer	Well is in removable bldg 10'x 10'. Contractor is required to remove and replace the bldg. Conestrainer

new

**Bid Schedule Schedule 2  
Specifications**

**ENTER PRICING IN THE YELLOW-SHADED AREA BELOW**

<b>COSTS:</b>	Lake Mary Well #1	Lake Mary Well #2	Lake Mary Well #4	Lake Mary Well #5	Lake Mary Well #7	Lake Mary Well 8	Lake Mary Well #9	
<b>A. Motor Only:</b>								
1. Mobilizatio								
2. Pull								
3. Motor								
4. Demobilizatio								
5. Special Conditions								
<b>TOTAL COST:</b>	-	-	-	-	-	-	-	-
	\$	\$	\$	\$	\$	\$	\$	\$
<b>B. Pump and Motor:</b>								
1. Mobilizatio	1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	
2. Pull Pump/	\$ 3,168.00	\$ 4,896.00	\$ 4,896.00	\$ 4,536.00	\$ 4,896.00	\$ 4,536.00	\$ 6,696.00	
3. Motor Pump/Motor	\$ 4,608.00	\$ 6,336.00	\$ 6,336.00	\$ 5,976.00	\$ 6,336.00	\$ 5,976.00	\$ 8,136.00	
4. Demobilizatio	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	
5. Special Conditions	\$	\$	\$	\$	\$	\$	\$	
<b>TOTAL COST:</b>	10,776.00	14,232.00	14,232.00	13,512.00	14,232.00	13,512.00	17,832.00	98,328.00
	\$	\$	\$	\$	\$	\$	\$	\$

\$ 98,328.00

 \*ENTER THIS AMOUNT INTO PLANET BIDS AS LINE ITEM #2

**Schedule 3**  
**Submersible Pumps/Motors**  
**Specifications**

Well Name:	Foxglenn Well	Continental Well	Shop Well	Ft. Tuthill Well	Rio Well	Interchange Well	Sinagua Well	McAllister
Date	2018	2002	2005	2015	2022	2002	2020	2020
Min Casing Size and Depth	8" liner/2004'	8" liner/2150'	12"/2488'	10"	12" Casing, depth 2530	10" Casing, depth 2340'	12" Casing, depth 2500'	10" Casing
<b>A: Motor</b>	Centrilift MSP	ESP, tandum 15's	Centrilift	Centrilift	Centrilift	Reda	Centrilift Mdl KMHJ	Centrilift
1. Horsepower	210	300	684 (tandem 342)	588(tandem 294)	150	150	184	200
2. Estimated Weight	3000 lbs	3000 lbs	3000	3000	2525 lbs	2525 lbs	2500 lbs	1200
3. Voltage	2380	2300	3390	3280	2300	2300	2400	2300
<b>B. Pump</b>	Centrilift HC10000 17 Stage	ESP, TJ 12000 (23 Stage)	Centrilift WJJ1000A 11 stage	Reda N1050A	Centrilift Flex 80	Reda J700N 19 stage	Centrilift HC 10000 17 stage	Centrilift HC7800 26 Stage
1. Estimated Weight	2500	2500	1000	1000	850	850	550	800
<b>C. Pump Column, diameter</b>	5 1/2", 8RND	5 1/2", 8RND	8 5/8" 8RND	8 5/8" 8 RND thread	4 1/2" OD	5 1/2" OD	5 1/2" 8RND	5.0" OD 8Rnd
1. Average Length	20', 73 joints	20', 84 joints	30'x 20'	21'	Range 3	20'	24'	42'
2. Total Length	1557'	1696'	1893'	1569'	1229'	1850'	1730'	
3. Estimated Weight	32000	32000	45000	45000	21000	32000	39000	32000
<b>D. Airline, Size</b>	Baski, (2) 1/4" stainless tubing	Baski, (2) 1/4" stainless tubing	Sounder tube, 1856	1" PVC, 1504	in annulus 1" 1800'	1 1/2" 1840'	1" PVC	
<b>E. Cable/Wire Size</b>	#2-3c, 5KV, round, galv armor	#2-3c, 5KV, round, galv armor	#2 rnd	#1 round	#4	#4 or 6	#4 3 cond-rnd	#6
<b>F. Check Valve, Size/Type</b>	(2) 5 1/2"	(2) 5 1/2"	8" (not listed)	8 5/8"	possibly none	5 1/2 OD at Pump	(1) 5 1/2"	
1. Location	90' and 680' above pump	80' and 900' above pump	just above pump	1458'	N/A		1690'	
<b>G. Special Conditions/Considerations</b>	Wellhouse is 1500' W of drilled well. Fencing is required around well because of public park.	Wellhouse is 800' N of drilled well. Fencing is required around well because of public park. No Shroud. 8" Pitless	Pitless adapter, sounder tube, no shroud	Baski pitless, no shroud	No shroud 12" pitless adapter w, 4" discharge casing has been repaired	has never been out of hole/see spec sheet	12" Baski pitless. Pull pipe is 5.0" OD 8Rnd	12" Baski pitless

**Bid Schedule 3**

**Specifications**

30 Foot Column

ENTER PRICING IN THE YELLOW-SHADED AREA BELOW

<b>COSTS:</b>	<b>Foxglenn Well</b>	<b>Continental Well</b>	<b>Shop Well</b>	<b>Ft. Tuthill Well</b>	<b>Rio Well</b>	<b>Interchange Well</b>	<b>Sinagua Well</b>	<b>McAllister Well</b>	
<b>A. Motor Only</b>									
1. Mobilization									
2. Pull Motor									
3. Install Motor									
4. Demobilization									
5. Special Conditions									
<b>TOTAL COST:</b>	-	-	-	-	-	-	-	-	-
	\$	\$	\$	\$	\$	\$	\$	\$	\$
<b>B. Pump and Motor:</b>									
1. Mobilization	1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	1,500.00
2. Pull Pump/Motor	\$ 5,976.00	\$ 7,056.00	\$ 8,424.00	\$ 5,976.00	\$ 8,424.00	\$ 8,064.00	\$ 7,056.00	\$ 7,056.00	\$ 7,056.00
3. Install Pump/Motor	\$ 5,976.00	\$ 7,056.00	\$ 8,424.00	\$ 5,976.00	\$ 8,424.00	\$ 8,064.00	\$ 7,056.00	\$ 7,056.00	\$ 7,056.00
4. Demobilization	\$ 7,416.00	\$ 8,496.00	\$ 9,864.00	\$ 7,416.00	\$ 9,864.00	\$ 9,504.00	\$ 8,496.00	\$ 8,496.00	\$ 8,496.00
5. Special Conditions	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00
<b>TOTAL COST:</b>	\$ 22,368.00	\$ 25,608.00	\$ 29,712.00	\$ 22,368.00	\$ 29,712.00	\$ 28,632.00	\$ 25,608.00	\$ 25,608.00	209,616.00
	\$	\$	\$	\$	\$	\$	\$	\$	\$
									<b>TOTAL FOR A: MOTOR ONLY</b>
									<b>TOTAL FOR B: PUMP AND MOTOR</b>
									209,616.00
									<b>ENTER THIS AMOUNT INTO PLANET BIDS LINE #3</b>
									\$

**Schedule 4**  
**Miscellaneous Services**

<b>Well Name:</b>	<b>Inner Basin Well #9</b>	<b>Inner Basin Well #11</b>	<b>Inner Basin Well #14</b>
Date	2001		
Min Casing Size and Depth	16"/352'	12"/485'	16"/502'
<b>A: Motor</b>	Cummings-Diesel	Cummings NT 855	Cummings NT 855P
1. Horsepower	280 HP	280 HP	280 HP
2. Estimated Weight	3000 lbs	3000 lbs	3000 lbs
3. Voltage	N/A	N/A	N/A
<b>B. Pump</b>	Johnston - 12cc, 7	Johnston - 10 GMC	Gould
1. Diameter	1 11/16"	1 1/2"	1 1/2"
2. Estimated Weight	2430 lbs	2000 lbs	4510 lbs
3. Diameter	2 1/2"	2 1/2"	3"
4. Average Length	20'	20'	20'
5. Estimated Weight	2450 lbs	2530 lbs	4610 lbs
<b>C. Pump Column</b>			
1. Diameter	8"	8"	8"
2. Average Length	20'	20'	20'
3. Estimated Weight	Johnston, type A, est. wt. 700 lbs	Johnston, size 16, est. wt. 700 lbs	Goulds, est. wt. 700 lbs
<b>D. Airline/Size</b>	3/4"x 21' Galv. Steel	3/4"x 21' Galv. Steel	1" Galv. Steel
<b>E. Special Conditions/Considerations</b>	Contractor will remove/replace well bldg. Access limited. Pipeline Road tunnel limits height to 10', width to 8 1/2'. Tunnel is 25' long. Lockett Meadow Rd is steep. Either rd leads to IB.	Contractor will remove/replace well bldg. Access limited. Pipeline Road tunnel limits height to 10', width to 8 1/2'. Tunnel is 25' long. Lockett Meadow Rd is steep. Either rd leads to IB.	Contractor will remove/replace well bldg. Access limited. Pipeline Road tunnel limits height to 10', width to 8 1/2'. Tunnel is 25' long. Lockett Meadow Rd is steep. Either rd leads to IB.

**Schedule 4**

**Miscellaneous Services**

ENTER PRICING IN THE YELLOW-SHADED AREA BELOW

<b>COSTS:</b>	<b>Inner Basin Well #9</b>	<b>Inner Basin Well #11</b>	<b>Inner Basin Well #14</b>
<b>A. Motor Only:</b>			
1. Mobilization	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00
2. Pull Motor	\$ 3,360.00	\$ 3,360.00	\$ 3,360.00
3. Install Motor	\$ 4,560.00	\$ 4,560.00	\$ 4,560.00
4. Demobilization	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00
5. Special Conditions			
<b>TOTAL COST:</b>	\$ 10,920.00	\$ 10,920.00	\$ 10,920.00
<b>B. Pump and Motor:</b>			
1. Mobilization	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00
2. Pull Pump/Motor	\$ 4,200.00	\$ 4,200.00	\$ 4,200.00
3. Install Pump/Motor	\$ 5,400.00	\$ 5,400.00	\$ 5,400.00
4. Demobilization	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00
5. Special Conditions			
<b>TOTAL COST:</b>	\$ 12,600.00	\$ 12,600.00	\$ 12,600.00

\$ 32,760.00 **TOTAL FOR A: MOTOR ONLY**

\$ 37,800.00 **TOTAL FOR B: PUMP AND MOTOR**

\$ 70,560.00 **\*ENTER THIS AMOUNT INTO PLANET BIDS AS LINE ITEM #4**

**Schedule 5A**  
**Booster Stations**  
 PUMPS WITH LINE SHAFTS

<b>Station and Name of Device:</b>	<b>Woody Mtn. Booster Sta, Pumps #1 &amp; #2</b>	<b>Reservoir Filtration Plant: P-2030, P-2040</b>	<b>Reservoir Filtration Plant, P-2130</b>	<b>Reservoir Filtration Plant, P-2100, P-2120</b>	<b>Raw Water Pump House, P1001 P1003 Surface Water</b>	<b>Raw Water Pump House, P1002 Surface Water</b>
<b>A. Motor</b>	U.S. Motor	U.S. Motor	U.S. Motor	U.S. Motor	U.S. Motor	U.S. Motor
1. Horsepower	135	75	30	15	200	250 (1964)
2. Estimated Weight	1250	1250	500	250	2000	2000
3. Voltage	440	440	440	440	440	440
<b>B. Pump</b>	Goulds	Worthington	Worthington	Worthington	Birkelback	Birkelback
1. Estimated Weight	850 lbs	850 lbs	850 lbs	850 lbs	850 lbs	
<b>C. Pump Column, diameter</b>	12"	5"	12"	5"	14"	14"
1. Average Length	30'	30'	30'	30'	30'	30'
<b>D. Special Conditions/Considerations</b>	Requires medium crane for removal	Requires large crane for removal of pump and motor	Requires large crane for removal of pump and motor	Requires large crane for removal of pump and motor	Requires medium crane for removal	Requires medium crane for removal

**Bid Schedule 5A Booster**

**Stations** PUMPS WITH LINE  
SHAFTS

ENTER PRICING IN THE YELLOW-SHADED AREA BELOW

<b>COSTS:</b>	<b>Woody Mtn. Booster Sta, Pumps #1 &amp; #2</b>	<b>Reservoir Filtration Plant: P-2030, P-2040</b>	<b>Reservoir Filtration Plant, P-2130</b>	<b>Reservoir Filtration Plant, P-2100, P-2120</b>	<b>Raw Water Pump House, P1001 P1003 Surface Water</b>	<b>Raw Water Pump House, P1002 Surface Water</b>	
<b>A. Motor Only</b>							
1. Mobilizatio	840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	
2. Pull	\$ 240.00	\$ 240.00	\$ 240.00	\$ 240.00	\$ 240.00	\$ 240.00	
3. Motor	\$ 390.00	\$ 390.00	\$ 390.00	\$ 390.00	\$ 390.00	\$ 390.00	
4. Demobilization	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	
5. Special Conditions	\$	\$	\$	\$	\$	\$	
<b>TOTAL COST:</b>	\$ 2,310.00	\$ 2,310.00	\$ 2,310.00	\$ 2,310.00	\$ 2,310.00	\$ 2,310.00	\$ 13,860.00 <b>TOTAL FOR A: MOTOR ONLY</b>
<b>B. Pump and Motor:</b>							
1. Mobilizatio	840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	
2. Pull pump/motor	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	
3. Install pump/motor	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	
4. Demobilization	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	
5. Special Conditions	\$	\$	\$	\$	\$	\$	
<b>TOTAL COST:</b>	\$ 3,120.00	\$ 3,120.00	\$ 3,120.00	\$ 3,120.00	\$ 3,120.00	\$ 3,120.00	\$ 18,720.00 <b>TOTAL FOR B: PUMP AND MOTOR</b>
							\$ 32,580.00 <b>ENTER THIS AMOUNT INTO PLANET BIDS #5</b>



**Bid Schedule 5B**

**Booster Stations**

ENTER PRICING IN THE YELLOW-SHADED AREA BELOW

PUMPS WITH LINE SHAFTS

<b>COSTS:</b>	<b>Raw Water Pump House, P2001 P2002 Well Water</b>	<b>Raw Water Pump House, P2003 Well Water</b>	<b>Lake Mary Water Plant, P-6201 P-6202 backwash</b>	<b>Lake Mary Water Plant, P-6001 (2 MGD)</b>	<b>Lake Mary Water Plant, P-6002 P-6003 (4MGD)</b>	<b>Lake Mary Water Plant, P-6004</b>	<b>Lake Mary Water Plant, wetwell pumps</b>
<b>A. Motor Only</b>							
1. Mobilization	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00
2. Pull Motor	\$ 240.00	\$ 240.00	\$ 240.00	\$ 240.00	\$ 240.00	\$ 240.00	\$ 240.00
3. Install Motor	\$ 390.00	\$ 390.00	\$ 390.00	\$ 390.00	\$ 390.00	\$ 390.00	\$ 390.00
4. Demobilization	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00
5. Special Conditions							
<b>TOTAL COST:</b>	\$ 2,310.00	\$ 2,310.00	\$ 2,310.00	\$ 2,310.00	\$ 2,310.00	\$ 2,310.00	\$ 2,310.00
							\$ 16,170.00 <b>TOTAL FOR A: MOTOR ONLY</b>
<b>B. Pump and Motor:</b>							
1. Mobilization	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00
2. Pull pump/motor	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00
3. Install pump/motor	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00
4. Demobilization	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00
5. Special Conditions							
<b>TOTAL COST:</b>	\$ 3,120.00	\$ 3,120.00	\$ 3,120.00	\$ 3,120.00	\$ 3,120.00	\$ 3,120.00	\$ 3,120.00
							\$ 21,840.00 <b>TOTAL FOR B: PUMP AND MOTOR</b>

\$ 38,010.00 \*ENTER THIS AMOUNT INTO PLANET BIDS AS LINE ITEM #6

**Schedule 6**  
**Booster Stations**  
PUMPS W/O LINE SHAFTS

Station and Name of Device:	Airport Booster Station, Patterson Fire Pump	Airport Booster Station, Transfer Pumps 1 & 2	University Highlands Bstr Sta, Domestic Pump #1 & #2	University Highlands Booster Station Fire Pump	Kinlani Booster Station	Railroad Springs Booster Station, Pump #1 & #2	Lake Mary Water Plant, Recovery Pond	Foxglenn Sinagua Distribution Pump	Tuthill Distribution Pump	Rio Well Distribution Pump	Shop Well Distribution Pump	Interchange Well Distribution Pump
<b>A. Motor</b>	Cummins	U.S. Motor	U.S. Motor	U.S. Motor	U.S. Motor			(2) U.S. Motor	U.S. Motor	U.S. Motor	U.S. Motor	U.S. Motor
1. Horsepower	182	2	15	75	15	125		50 ea	100	20	125	
2. Estimated Weight	1000	100	120	1000	100	500	1150	750 ea	1000	125	1200	
3. Voltage	Diesel	220 single phase	440	440	440	480	440	480	480	480	460	
<b>B. Pump</b>	Patterson	Peerless	PACO	Fairbanks Morse	Peerless	HSC 4.5.11c	Myers	(2) Aurora type 420 multi stage split case	Aurora type 410 1 stage split case	Fairbanks Morse	Fairbanks Morse, 12m 7000aw, 5 stages	Fairbanks Morse 8m 7000aw, 11 stages
1. Estimated Weight	850 lbs	150 lbs	50 lbs	850 lbs	150 lbs	1000 lbs	150 lbs					
<b>C. Special Conditions/Consdetations</b>	Pump and engine must be rolled out of building to be removed	Small Pumps < 200 lbs	Pumps inside building need small lifting aid to handle easily	Pump is horizontal- requires existing trolley to remove from building		Skid mounted. Small crane with 1 ton capacity should be able to remove these			Crane required to lift through roof	Crane required to lift through roof	Requires large crane for removal through skylite	Requires large crane for removal through skylite

Bid Schedule 6

Booster Stations

PUMPS W/O LINE SHAFTS

ENTER PRICING IN THE YELLOW-SHADED AREA BELOW

	Airport Booster Station, Patterson Fire Pump	Airport Booster Station, Transfer Pumps 1 & 2	University Highlands Bstr Sta, Domestic Pump #1 & #2	University Highlands Booster Station Fire Pump	Kinlani Booster Station	Railroad Springs Booster Station, Pump #1 & #2	Lake Mary Water Plant, Recovery Pond	Foxglenn Sinagua Distribution Pump	Tuthill Distribution Pump	Rio Well Distribution Pump	Shop Well Distribution Pump	Interchange Well Distribution Pump	
<b>COSTS:</b>													
<b>A. Pump Only</b>													
1. Mobilization	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	
2. Pull	\$ 480.00	\$ 180.00	\$ 240.00	\$ 420.00	\$ 180.00	\$ 240.00	\$ 300.00	\$ 360.00	\$ 420.00	\$ 180.00	\$ 420.00	\$ 420.00	
3. Install	\$ 600.00	\$ 240.00	\$ 300.00	\$ 540.00	\$ 240.00	\$ 300.00	\$ 420.00	\$ 480.00	\$ 540.00	\$ 240.00	\$ 540.00	\$ 540.00	
4. Demobilization	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	
5. Special Conditions													
<b>TOTAL COST:</b>	\$ 2,280.00	\$ 1,620.00	\$ 1,740.00	\$ 2,160.00	\$ 1,620.00	\$ 1,740.00	\$ 1,920.00	\$ 2,040.00	\$ 2,160.00	\$ 1,620.00	\$ 2,160.00	\$ 2,160.00	\$ 23,220.00 TOTAL FOR A: PUMP ONLY
<b>B. Pump and Motor:</b>													
1. Mobilization	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	
2. Pull Pump/Motor	\$ 720.00	\$ 300.00	\$ 360.00	\$ 540.00	\$ 300.00	\$ 360.00	\$ 420.00	\$ 480.00	\$ 540.00	\$ 300.00	\$ 540.00	\$ 540.00	
3. Install Pump/Motor	\$ 840.00	\$ 420.00	\$ 420.00	\$ 660.00	\$ 360.00	\$ 420.00	\$ 540.00	\$ 720.00	\$ 660.00	\$ 360.00	\$ 660.00	\$ 660.00	
4. Demobilization	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	
5. Special Conditions												26,520.00	TOTAL FOR B: PUMP AND MOTOR
<b>TOTAL COST:</b>	\$ 2,760.00	\$ 1,920.00	\$ 1,980.00	\$ 2,400.00	\$ 1,860.00	\$ 1,980.00	\$ 2,160.00	\$ 2,400.00	\$ 2,400.00	\$ 1,860.00	\$ 2,400.00	\$ 2,400.00	\$ 49,740.00 *ENTER THIS AMOUNT INTO PLANET BIDS AS LINE ITEM #7

\$

**Schedule 7**  
**Pumps at Rio De Flag**

Station and Name of Device:	Influent Pumps	Horizontal End Suction Pumps	Vertical Turbine Pumps (Reclaim Pumps)	Submersible Propeller Mixer (Recirculation Mixer)
<b>A. Number of Units</b>	5	5	4	pump & motor are one unit
B. Motor	Marathon	Marathon	G.E.	FLYGT
1. Horsepower	100	10	250	10
2. Estimated Weight	1500 lbs	294 lbs	2400 lbs	530 lbs
3. Voltage	460	460	460	460
<b>C. Pump</b>	Aurora	Aurora	Ingersoll	N/A
1. Model	613A	611P		PP-4451
2. Size	6*8*18	6*6*12B		N/A
3. Gallons Per Minute	2600	700	2150	
4. Estimated Weight	1530 lbs	131	3500	N/A
<b>D. Special Conditions/Considerations</b>	Building has traveling bridge crane for lifting pump and motor, two ton capacity.	Pump room has overhead fixed chain hoist in middle of room.	Five stage pump. Building has traveling bridge crane for lifting motors and pumps, three ton capacity.	Portable winch assembly on site for removal from basin.

**Bid Schedule 7**

**Pumps at Rio De Flag**

**ENTER PRICING IN THE YELLOW-SHADED AREA BELOW**

<b>COSTS:</b>	<b>Influent Pumps</b>	<b>Horizontal End Suction Pumps</b>	<b>Vertical Turbine Pumps (Reclaim Pumps)</b>	<b>Submersible Propeller Mixer (Recirculation Mixer)</b>
<b>A. Pump Only:</b>				
1. Mobilization	\$ 600.00	\$ 600.00	\$ 600.00	
2. Pull pump	\$ 600.00	\$ 180.00	\$ 840.00	N/A
3. Install pump	\$ 720.00	\$ 240.00	\$ 960.00	SINGLE UNIT
4. Demobilization	\$ 600.00	\$ 600.00	\$ 600.00	
5. Special Conditions				
<b>TOTAL COST:</b>	\$ 2,520.00	\$ 1,620.00	\$ 3,000.00	\$ -
<b>B. Pump and Motor</b>				
1. Mobilization	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00
2. Pull pump/motor	\$ 840.00	\$ 300.00	\$ 960.00	\$ 480.00
3. Install pump/motor	\$ 960.00	\$ 360.00	\$ 1,080.00	\$ 720.00
4. Demobilization	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00
5. Special Conditions				
<b>TOTAL COST:</b>	\$ 3,000.00	\$ 1,860.00	\$ 3,240.00	\$ 2,400.00

\$ 7,140.00

**TOTAL FOR A: PUMP ONLY**

\$ 10,500.00

**TOTAL FOR B: PUMP AND MOTOR**

\$ 17,640.00

**\*ENTER THIS AMOUNT INTO PLANET BIDS AS LINE ITEM #8**

**Schedule 8  
Booster Stations**

Station and Name of Device:	Bio Sump Pump #1	Bio Sump Pump #2	Tow Low Pressure Pumps	Three High Pressure Pumps	P.E. Pumps and Motors	FCC Pumps and Motors	Reclaim Tank Fill Pump	SEPS Pumps
<b>A. Number of Units</b>	1	1	2	3	4	3	1	3
<b>B. Motor</b>	Waukesha	Yaskawa, 3 Phase	US Vertical Hallow Shaft	US Vertical Hallow Shaft	US Electrical	RUI US Motors	US Motor VIT	GE Vertical Induction, High
1. Horsepower	250 HP	250 HP	15 HP	20 HP	40 HP	75 HP	10 HP	59 HP
2. Estimated Weight	6000 lbs	6170 lbs	250 lbs	250 lbs	600 lbs	400 lbs	300 lbs	800 lbs
3. Voltage	N/A	480	480	480	480	460	480	460
<b>C. Pump</b>	Aurora	Aurora	Johnson, Type A, 3 Stage, 10 DOL, Peabody	Johnson, Type A, 9 Stage Goul Pump Bowl Assembly	Cascade/Auru	Goul	Gould	Fairbanks/Morse
1. Model	V31-72529	V31-72530	JTA	JTA	15837-40	11CLC	11CLC	8312
2. Size	25"	25"	6"	6"	12 MFCH	11 CLC	11 CLC	1 STG 14"
3. Gallons Per Minute	17,500	17,500	450	260	5550	1085	975	8000
4. Estimated Weight	2500 lbs	2500 lbs	650 lbs	800 lbs	1800 lbs	700 lbs	700 lbs	2300 lbs
<b>D. Pump Housing</b>								
1. Diameter	30"	30"	6"	6"	12"	7.6975", 6 stages	7.13"	16"
2. Length	15'	15'	15'	11'	18', including motor	11', including motor	11'	16'
<b>E. Check Valve</b>								
1. Size	N/A	N/A	4"	4"	16-150 W	6"	6"	EDDY 10 WA 16 LIST 114
2. Location	N/A	N/A	Discharge side of pump	Discharge side of pump	Discharge side of pump, flange to flange.	Discharge side of pump	Discharge side of pump	Discharge side of pump

<b>F. Special Conditions/Considerations</b>	Requires rigging to remove motor and pump from sump and building. Overhead crane available for removal of right angle gear and pump.	Requires rigging to remove motor and pump from sump and building.	Roof cover will need to be removed to access pumps and motors for removal.	Roof cover will need to be removed to access pumps and motors for removal.	Roof cover will need to be removed to access pumps and motors for removal.	Roof cover will need to be removed to access pumps and motors for removal.	Roof cover will need to be removed to access pumps and motors for removal.	Roof cover will need to be removed to access pumps and motors for removal.
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**Bid Schedule 8  
Booster Stations**

ENTER PRICING IN THE YELLOW-SHADED AREA BELOW

COSTS:	Bio Sump Pump #1	Bio Sump Pump #2	Tow Low Pressure Pumps	Three High Pressure Pumps	P.E. Pumps and Motors	FCC Pumps and Motors	Reclaim Tank Fill Pump	SEPS Pumps
<b>A. Pump Only:</b>								
1. Mobilization	\$ 840.00	\$ 840.00						
2. Pull Pump	\$ 960.00	\$ 960.00						
3. Install Pump	\$ 1,080.00	\$ 1,080.00						
4. Demobilization	\$ 840.00	\$ 840.00						
5. Special Conditions								
<b>TOTAL COST:</b>	\$ 3,720.00	\$ 3,720.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>B. Pump and Motor</b>								
1. Mobilization	\$ 840.00	\$ 840.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00		
2. Pull pump & motor	\$ 1,080.00	\$ 1,080.00	\$ 840.00	\$ 840.00	\$ 840.00	\$ 840.00		
3. Install pump & motor	\$ 1,200.00	\$ 1,200.00	\$ 960.00	\$ 960.00	\$ 960.00	\$ 960.00		
4. Demobilization	\$ 840.00	\$ 840.00	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00		
5. Special Conditions								
<b>TOTAL COST:</b>	\$ 3,960.00	\$ 3,960.00	\$ 3,000.00	\$ 3,000.00	\$ 3,000.00	\$ 3,000.00	\$ -	\$ -

 TOTAL FOR A: PUMP ONLY

 TOTAL FOR B: PUMP AND MOTOR

 \*ENTER THIS AMOUNT INTO PLANET BIDS AS LINE ITEM #9

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Ken Ferguson, Cinder Lake Landfill Project Manager  
**Co-Submitter:** Sam Beckett  
**Co-Submitter:** Sam Beckett  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



**TITLE:**

**Consideration and Approval of Contract:** Professional Services Agreement with Friedman Recycling Company for compaction, transportation, and the processing of recyclable materials.

**STAFF RECOMMENDED ACTION:**

1. Approve the Professional Services Agreement with Friedman Recycling Company for compaction, transportation, processing, and the processing of recyclable materials; and
2. Authorize the City Manager to execute the necessary documents.

**Executive Summary:**

Staff solicited a Request for Proposals for Recycling Processing and Transportation Services in early 2024. Four proposals were received, and one subsequently withdrew. A selection committee reviewed the three remaining proposals and selected the proposal from Friedman Recycling Company as the best opportunity for the City. Considerations in this selection included qualifications, industry-specific experience, past performance, the presented approach, and price.

The City is currently under contract with Friedman Recycling Company to provide processing and transportation services, and this Professional Service Agreement (Agreement) essentially continues this relationship. Through the proposal effort and contract negotiations, staff identified areas for improvements in services and efficiency and have built those into this Agreement. Under this Agreement, Friedman will provide two horizontal compactors for maximizing the transfer weights of recycling materials, haul the recycling materials from Flagstaff to their materials recovery facility in Phoenix, and process the recycling materials. The term of the Agreement is 2 years with three, 12-month extensions. Based on an estimated total of 500 tons of commingled recyclables per month, it is estimated that the Friedman Agreement will cost the City approximately \$70,000 per month, or \$140 per ton, post-collection. City staff support the operations and logistics of recycling material management on-site and during the compaction process.

This Agreement allows the City to consider further evaluation of installing a baler process to more efficiently compact and transport recyclables, providing the potential to achieve possible future savings and efficiencies.

**Financial Impact:**

Project Name: Transfer Station Contractuals/Commodities  
 Cost: Approximately \$70,000 per month  
 Account Number Budgeted: 211-06-168-0649-0-4240 (Equipment Rental), 211-06-168-0649-0-4269 (Transporting Services), 211-06-168-0649-0-4221 (Processing)  
 FY2024-25 Budgeted Amount: \$982,500  
 Grant Funded: No  
 Funding Source: Solid Waste Enterprise Fund

**Policy Impact:**

This Agreement allows the City to maintain recycle services and to ensure that materials are recycled to their fullest extent possible. These services are considered to be of community interest, environmental stewardship, natural resource conservation, preservation of the Cinder Lake Landfill capacity, and directly support the City's Rethink Waste and Carbon Neutrality Plans. Through this Agreement the City will be able to accept recycling materials and the Solid Waste department will be working with Sustainability and our Public Information Office to communicate these best practices to the public on all items that are eligible for good quality collection and recycling.

**Previous Council Decision or Community Discussion:**

On June 20, 2023, Council approved a Professional Services Agreement with Friedman Recycling Company for equipment, transportation, processing and recovery of recyclable materials. This previous agreement was for a term of six months with two, three-month extensions.

**Options and Alternatives to Recommended Action:**

1. Approve the Agreement with Friedman Recycling Company for compaction, transportation, and the processing of recyclable materials; or
2. Reject the Agreement and re-solicit quotes for alternative considerations; or
3. Revise the terms and conditions, and return to the vendor for further discussions; or
4. Discontinue the recycling program and establish collection services of the community solid waste total volumes as required.

**Background and History:**

Friedman will maximize hauling efficiencies to limit the City's carbon and energy footprint to the largest degree practical while ensuring continuity in the City's recycling needs and movement of commingled recyclables to the Phoenix metropolitan area. Friedman has worked with the City for the last year providing similar services and the City and Friedman have used this Agreement to further improve these services. Through this agreement, the City will be able to recycle the following materials.

1. Mixed Paper (#54)
2. Clean Cardboard/Old Corrugated Containers (OCC #11)
3. Plastic #1 PET threaded bottles, jars, and jugs
4. Plastic #2 HDPE Natural threaded bottles, jars, and jugs
5. Plastic #2 HDPE Color threaded bottles, jars, and jugs
6. Plastic #5 Polypropylene tubs and containers
7. Steel/Tin Cans and Containers
8. Aluminum Cans and Containers
9. Mixed Rigid/Bulk Plastics

It is noted that the City also recycles glass through a separate Agreement with a different contractor. The glass program is an opt-in subscription service offered to city residents in addition to community drop off locations.

The City Procurement and Solid Waste Sections conducted Request for Proposals competitive solicitation for Material Recycling Facility Services and received proposals for two disciplines, from the following contractors: Joe Dirt Hauling, Waste Management of Arizona, and Friedman Recycling. Friedman Recycling was deemed the highest scoring, responsible, responsive proposer in each discipline. The scoring for these disciplines is as follows:

**Transportation & Compaction**

- Joe Dirt Hauling - 564
- Friedman Recycling - 779

**Processing & Recovery**

- Waste Management of Arizona - 656
- Friedman Recycling - 731

The Solid Waste and Procurement Section request approval from Council to move forward with Friedman for contract award.

**Connection to PBB Priorities and Objectives:**

- High Performance Governance
  - Serve the public by providing high quality customer service
  - Encourage public trust through transparency, accessibility and use of the City's public participation policy
- Safe & Healthy Community
  - Foster a safe, secure, and healthy community
  - Develop alternative diversion programs
- Inclusive & Engaged Community
  - Foster community pride and civic engagement
- Sustainable, Innovative Infrastructure
  - Utilize existing long-range plan(s) that identify the community's future infrastructure needs and all associated costs.
  - Deliver outstanding services to residents through a healthy, well maintained infrastructure system.
- Environmental Stewardship
  - Promote, protect, & enhance a healthy, sustainable environment & its natural resources.

**Connection to Regional Plan:**

Policy LU.16.1. Encourage the continued intensification, expansion, and protection of existing industrial, warehousing, and distribution uses from encroachment where appropriate.

Policy PF.1.4. Build, sustain, and leverage partnerships with local and regional stakeholders for collective investment, efficient action, and shared responsibility in the building of local resiliency.

Policy PF.1.7. Develop strategies and take meaningful steps toward extending the life of the landfill.

Policy PF.2.3. Provide accessible public facilities and services in strategic locations.

**Connection to Carbon Neutrality Plan:**

- Carbon Neutrality Plan
  - Goal ES-4 -- Actively seek to recognize past harms, repair trust, and build deeper relationships with community members.
  - Goal MM-3 -- Divert more waste from the landfill.
  - Goal PF.2 -- Provide sustainable and equitable public facilities, service, and infrastructure systems in an efficient and effective manner to serve all population areas and demographics.

**Connection to 10-Year Housing Plan:**

N/A

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**Attachments:**     Agreement with Friedman Recycling Company  
                             Exhibit A to Agreement with Friedman Recycling

**PROFESSIONAL SERVICES AGREEMENT  
BETWEEN  
THE CITY OF FLAGSTAFF, ARIZONA  
AND**

Contract No. 2024-xxx

THIS AGREEMENT is made between the **CITY OF FLAGSTAFF**, a political subdivision of the State of Arizona (“City”), and **FRIEDMAN RECYCLING COMPANY** an Arizona corporation (“Contractor”). The City and Contractor may be referred to in this agreement as “Party” in the singular, and collectively as the “Parties.” The Parties agree as follows:

1. Term of Agreement.

1.1. The Agreement term is for a period of two (2) years from the effective date unless terminated pursuant to the Terms and Conditions.

1.1.1. **Agreement Probation Period.** The first ninety (90) days of the Agreement term starting at the Agreement effective date shall be a probation period. The City shall have the right to terminate the Agreement at any time during the probation period if the City determines, in its sole discretion, that Contractor has failed to meet the performance expectations outlined in the Agreement and attached Scope of Work. The City reserves the right to cancel or extend the probation period by written notice to the Contractor, which notice must be given before the end of the probation period. If the Contractor’s performance during the probation period is satisfactory, the City will notify Contractor in writing that the probation period has expired, and the Agreement term and duration will continue pursuant to the Agreement Terms and Conditions.

1.2. The Agreement may be renewed or extended for up to three (3) additional one (1) year periods by mutual written consent of the Parties. The City Manager or his designee (the Purchasing Director) shall have authority to approve renewal on behalf of the City.

1.3. Subject to the termination provisions in this Agreement and Exhibit A, Contractor will be the exclusive provider of compaction, hauling, and processing services related to the transportation and processing of recycling materials collected or accepted by the City.

1.4. The Agreement is effective as of the date the last Party executes the Agreement.

2. Scope of Work. Contractor will provide the services as set forth in the Scope of Work attached as Exhibit A (the “Services”), which is incorporated by reference.

The rates and amounts to be paid are inclusive of all Services, including all labor, travel, and expenses through completion of the work.

3. Payments. The City will pay Contractor subject to Contractor submitting an invoice to the City for each requested payment. Invoices will itemize all Services completed to the date of the invoice and provide sufficient detail to justify payment. Upon approval of the invoice, the City will pay the invoiced amount to Contractor.
4. Ownership of Documents. All documents prepared and submitted to the City by Contractor pursuant to this Agreement will be the property of the City.
5. Contractor Personnel. Contractor will provide adequate, experienced personnel capable of providing the Services described in the Scope of Work during the term of this Agreement.
6. Licenses; Materials. Contractor must maintain in current status all federal, state, and local licenses and permits required for the operation of Contractor's recycling materials processing business and transportation operation required for this Agreement.
7. Force Majeure. Except for payment for sums due, neither Party will be liable to the other nor deemed in default under this Agreement if and to the extent that such Party's performance of this Agreement is prevented by reason of force majeure. The term "force majeure" means an occurrence that is beyond the control of the Party affected and occurs without its fault or negligence. Without limiting the foregoing, force majeure includes acts of God; acts of the public enemy; war; acts of terror, hate crimes affecting public order; riots; strikes; mobilization; labor disputes; civil disorders; plague; pandemics (including without limitation, the COVID-19 pandemic); epidemics; quarantine orders or directives by a governmental entity; outbreaks of infectious disease or any other public health crisis, including without limitation, quarantine or other employee restrictions; fire; floods; lockouts, injunctions-interventions-acts, or failures or refusals to act by government authority; events or obstacles resulting from a governmental authority's response to the foregoing; governmental restriction and/or intervention in the buying, selling, and/or transporting of recyclable commodities; inability to secure sufficient suitable labor, machinery, and equipment, including spare parts and supplies necessary for the safe and efficient operation of the recycling facility, and other similar occurrences beyond the reasonable control of the Party declaring force majeure which such Party is unable to prevent by exercising reasonable diligence. The affected Party notifies the other Party of the existence of the force majeure and will be deemed to continue as long as the results or effects of the force majeure prevent the Party from resuming performance in accordance with this Agreement. Force majeure will not include the following occurrences:
  - 7.1. Failure or delay resulting from general economic conditions or other market effects, foreseen or unforeseen, including any increase in the cost of

materials, supplies, or services, or any decrease in profit or profit margins resulting therefrom;

- 7.2. Late delivery of equipment or materials caused by congestion at a manufacturer's plant or elsewhere, an oversold condition of the market, inefficiencies, or similar occurrences; or
- 7.3. Late performance by a subcontractor unless the delay arises out of a *force majeure* occurrence in accordance with this section.

8. Insurance.

8.1. General.

8.1.1. Insurer Qualifications. Without limiting any obligations or liabilities of Contractor, Contractor must purchase and maintain, at its own expense, hereinafter stipulated minimum insurance with insurance companies duly licensed by the State of Arizona.

8.1.2. No Representation of Coverage Adequacy. By requiring insurance herein, the City does not represent that coverage and limits will be adequate to protect Contractor. The City reserves the right to review any and all of the insurance policies and/or endorsements cited in this Agreement but has no obligation to do so. Failure to demand such evidence of full compliance with the insurance requirements set forth in this Agreement or failure to identify any insurance deficiency will not relieve Contractor from, nor be construed or deemed a waiver of, its obligation to maintain the required insurance at all times during the performance of this Agreement.

8.2. Insurance Requirements.

8.2.1. Contractor and subcontractors must procure and maintain until all of their obligations have been discharged, including any warranty periods under this Agreement, are satisfied, insurance against claims for injury to persons or damage to property which may arise from or in connection with the performance of the work hereunder by Contractor, its agents, representatives, employees, or subcontractors.

8.2.2. The insurance requirements herein are minimum requirements for this Agreement and in no way limit the indemnity covenants contained in this Agreement. The City in no way warrants that the minimum limits contained herein are sufficient to protect Contractor from liabilities that might arise out of the performance of the work under this Agreement by Contractor, its agents, representatives,

employees, or subcontractors, and Contractor is free to purchase additional insurance.

8.3. Minimum Scope and Limits of Insurance. Contractor must provide coverage with limits of liability not less than those stated in this Agreement below.

8.3.1. Commercial General Liability – Occurrence Form

The policy must include bodily injury, property damage, personal injury, and broad form contractual liability coverage.

General Aggregate	\$2,000,000
Products - Completed Operations Aggregate	\$1,000,000
Personal and Advertising Injury	\$1,000,000
Blanket Contractual Liability – Written and Oral	\$1,000,000
Fire Legal Liability	\$50,000
Each Occurrence	\$1,000,000

The policy must be endorsed to include the City of Flagstaff and its departments, agencies, boards, commissions, officers, officials, agents, and employees as additional insureds with respect to liability arising out of the activities performed by or on behalf of Contractor. The City of Flagstaff shall be named as an additional insured on all Certificates of Insurance (“COI”) and the COI should reference this Agreement.

8.3.2. Business Automobile Liability

The policy must include coverage for bodily injury and property damage for any owned, hired, and/or non-owned vehicles used in the performance of this Agreement.

Combined Single Limit (CSL)	\$1,000,000
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The policy must be endorsed to include the City of Flagstaff and its departments, agencies, boards, commissions, officers, officials, agents, and employees as additional insureds with respect to liability arising out of the activities performed by or on behalf of Contractor involving automobiles owned, leased, hired, or borrowed by Contractor. The City of Flagstaff shall be named as an additional insured on all Certificates of Insurance (“COI”) and the COI should reference this Agreement.

8.3.3. Worker's Compensation and Employers' Liability

The policy must include workers' compensation statutory employers' liability coverage.

Each Accident	\$ 500,000
Disease – Each Employee	\$ 500,000
Disease – Policy Limit	\$1,000,000

8.3.4. Professional Liability (Errors and Omissions Liability)

The policy must include professional liability coverage.

Each Claim	\$1,000,000
Annual Aggregate	\$2,000,000

- a) In the event that the professional liability insurance required by this Agreement is written on a claims-made basis, Contractor warrants that any retroactive date under the policy will precede the effective date of this Agreement; and that either continuous coverage will be maintained or an extended discovery period will be exercised for a period of two (2) years beginning at the time work under this Agreement is completed.
- b) The policy must cover professional misconduct or lack of ordinary skill for those positions defined in the Scope of Work of this Agreement.

8.4. Contractor's Coverage is Primary. Contractor's insurance coverage will be primary insurance and non-contributory with respect to all other available sources. Coverage provided by Contractor may not be limited to the liability assumed under the indemnification provisions of this Agreement.

8.5. Notice of Cancellation. Each insurance policy required by this Agreement must provide the required coverage and may not be suspended, voided, canceled, or reduced. Contractor must provide the City with prompt notice if the insurance is suspended, voided, cancelled, or reduced. Such notice must be sent directly to the City's procurement division.

8.6. Verification of Coverage. Contractor will furnish the City with a declarations page for each policy, as well as any amendments or riders in order to verify contractual insurance requirements are being satisfied.

All certificates and endorsements are to be received and approved by the City's procurement division before work commences. Each insurance policy required by this Agreement must be in effect at or prior to

commencement of work under this Agreement and remain in effect for the duration of the project.

All certificates required by this Agreement must be sent directly to the City's procurement division. The City project/contract number, if applicable, and project description must be noted on the certificate of insurance. The City reserves the right to require complete, certified copies of all insurance policies required by this Agreement at any time.

- 8.7. Subcontractors. Contractor's certificate(s) must include all subcontractors as insureds under its policies or Contractor must furnish to the City separate certificates and endorsements for each subcontractor. All coverage for subcontractors is subject to the same terms and conditions and minimum requirements identified above. Contractor shall ensure for any subcontractor policy required under this Agreement and for any policy required by a contract between Contractor and each subcontractor. The subcontractors' certificates of insurance shall list the "City of Flagstaff" as the Certificate Holder and as an additional insured (and any other entities that are required to be listed as such), and shall identify in each certificate of insurance's description: (i) this Agreement by Agreement Number, and (ii) any subcontract between the subcontractor and Contractor related to that subcontractor's work under this Agreement.
- 8.8. Approval. Any modification or variation from the *insurance requirements* in this Agreement will be made by the City, whose decision is final. Such action will not require a formal Agreement amendment, but may be made by administrative action.
9. Indemnification. Each Party (as "Indemnitor") agrees to indemnify, defend, and hold harmless the other Party (as "Indemnitee") from and against any and all claims, losses, liability, costs, or expenses (including reasonable attorney fees) (hereinafter collectively referred to as "Claims") arising out of bodily injury of any personal (including death) or property damage, but only to the extent that such claims which result in vicarious/derivative liability to the Indemnitee are caused by the act, omission, negligence, misconduct, or other fault of the Indemnitor, its officers, officials, agents, employees, or volunteers.
10. Applicable Law; Venue. In the performance of this Agreement, Contractor will abide by and conform to any and all laws of the United States, the State of Arizona, and the City of Flagstaff, including but not limited to federal and state executive orders providing for equal employment and procurement opportunities, the Federal Occupational Safety and Health Act, and any other federal or state laws applicable to this Agreement. This Agreement is governed by the laws of the State of Arizona and suit pertaining to this Agreement may be brought only in courts in the State of Arizona in Maricopa County.

11. Termination; Cancellation.

11.1. Termination.

11.1.1. Probation Period. Pursuant to section 1.1.1. above, the Agreement may be terminated by the City during the probation period due to Contractor's failure to meet the performance expectations outlined in the Agreement and attached Scope of Work.

11.1.2. For Cause. If Contractor fails to materially perform pursuant to the terms of this Agreement and the Scope of Work, City shall provide written notice to Contractor specifying the reason(s) for default. If Contractor does not cure such default(s) within fifteen (15) days, the City may terminate this Agreement for cause. Upon termination for cause, Contractor will be paid for all undisputed services performed up to the termination date. If the Agreement is terminated for cause, there will be no early termination fee.

11.2. Conflict of Interest. This Agreement is subject to the provisions of A.R.S. § 38-511. The City may cancel this Agreement without penalty or further obligations by the City or any of its departments or agencies if any person significantly involved in initiating, negotiating, securing, drafting, or creating this Agreement on behalf of the City or any of its departments or agencies is at any time while the Agreement or any extension of the Agreement is in effect an employee or agent of any other party to the Agreement in any capacity or a consultant to any other party of the Agreement with respect to the Agreement subject.

11.3. Fund Appropriation Contingency. Contractor understands that the continuation of this Agreement is subject to the budget of the City providing for the contract item as an expenditure, which is supported by a fee paid by City residents. If for any reason, the fee is repealed or not renewed as part of any Council action and the City no longer provides recycling services, the City may terminate this Agreement. Upon termination, Contractor will be paid for all undisputed services performed up to the termination date.

12. Miscellaneous.

12.1. Relationship of the Parties; Independent Contractor. Each Party will act in its individual capacity and not as an agent, employee, partner, joint venturer, or associate of the other. An employee or agent of one Party may not be deemed or construed to be the employee or agent of the other for any purpose whatsoever. Contractor is advised that taxes or Social Security payments will not be withheld from any City payments issued hereunder and the Contractor agrees to be fully and solely responsible for the payment of such taxes or any other tax applicable to this Agreement. Contractor, its

employees, and subcontractors are not entitled to workers' compensation benefits from the City. The City does not have the authority to supervise or control the actual work of Contractor, its employees, or subcontractors. Contractor, and not the City, will determine the time of its performance of the Services so long as Contractor meets the requirements of this Agreement. Contractor is neither prohibited from entering into other contracts nor prohibited from practicing its profession elsewhere.

- 12.2. Laws and Regulations. Contractor must at all times during the performance of its duties under this Agreement ensure that it and any person for whom Contractor is responsible remains in compliance with all rules, regulations, ordinances, statutes, or laws affecting the Services, including existing and future (i) City and County ordinances and regulations, (ii) state and federal laws, and (iii) Occupational Safety and Health Administration standards.
- 12.3. Amendments. This Agreement may be modified only by a written amendment signed by persons duly authorized to enter into contracts on behalf of the City and Contractor.
- 12.4. Provisions Required by Law. Each and every provision of law and any clause required by law to be in the Agreement will be read and enforced as though it were included and, if through mistake or otherwise, any such provision is not inserted, or is not correctly inserted, then upon the application of either Party, the Agreement will promptly be physically amended to make such insertion or correction.
- 12.5. Severability. The provisions of this Agreement are severable. To the extent that any provision is held to be invalid by a court of competent jurisdiction, such holding will not affect any other provision of the Agreement which may remain in effect without the invalid provision.
- 12.6. Entire Agreement; Interpretation; Parole Evidence. This Agreement represents the entire agreement of the Parties with respect to its subject matter. All previous agreements or proposals, whether oral or written, entered into prior to this Agreement are hereby revoked and superseded by this Agreement. No representations, warranties, inducements, or oral agreements have been made by any of the Parties except as expressly set forth in this Agreement. This Agreement will be construed and interpreted according to its plain meaning, and no presumption will be deemed to apply in favor of or against the Party drafting the Agreement. The Parties acknowledge and agree that each has had the opportunity to seek and utilize legal counsel in drafting, reviewing, and entering into this Agreement.
- 12.7. Assignment; Subcontractor. No right or interest in this Agreement may be assigned by Contractor without prior written permission of the City, signed by the City Manager, which shall not be unreasonably withheld. No delegation of any duty of the Contractor may be made without prior written

permission of the City, signed by the City Manager, which shall not be unreasonably withheld. Notwithstanding the foregoing, Contractor's use of subcontractors, vendors, and/or contracted third-parties to provide a portion of the Services shall not be deemed a delegation of duty nor a violation of this Agreement.

- 12.8. Subcontracts. Prior to performing any Services as defined in the Scope of Work, Contractor shall provide the City a written list of the corporate names and addresses of any other subcontractors or entities who may receive and/or process the City's recycling materials and/or the corporate names and addresses of landfills where the recycling materials may be disposed. Contractor is responsible for performance under this Agreement whether or not subcontractors or other entities are used.
- 12.9. Rights and Remedies. No provision in this Agreement may be construed, expressly or by implication, as a waiver by the City of any existing or future right or remedy available by law in the event of any claim of default or breach of this Agreement. The failure of the City to insist upon the strict performance of any term or condition of this Agreement or to exercise or delay the exercise of any right or remedy provided in this Agreement, or by law, or the City's acceptance of and payment for services, will not release Contractor from any responsibilities or obligations imposed by this Agreement or by law, and will not be deemed a waiver of any right of the City to insist upon the strict performance of this Agreement.
- 12.10. Attorneys' Fees. Each Party hereto shall bear its own costs, expenses, and attorneys' fees in connection with the negotiation, preparation, execution, delivery, performance, and/or on account of any breach or default of this Agreement.
- 12.11. Notices and Requests. Any notice or other communication required or permitted to be given under this Agreement must be in writing. Notices will be deemed to have been duly given if (i) delivered to the Party at the address set forth below, (ii) deposited in the U.S. Mail, registered or certified, return receipt requested, to the address set forth below, (iii) given to a recognized and reputable overnight delivery service, to the address set forth below, or (iv) delivered by email to the address set forth below or at such other address, and to the attention of such other person or officer, as any Party may designate in writing by notice duly given pursuant to this section.

To the City:                      City of Flagstaff  
Public Works Division  
Attn: Solid Waste Section Director  
3200 W. Route 66  
Flagstaff, Arizona 86001

With Copy to: City of Flagstaff  
Purchasing Department  
211 W. Aspen Ave  
Flagstaff, Arizona 86001  
Attn: Patrick Brown  
Email: pbrown@flagstaffaz.gov

If to Contractor: Friedman Recycling Company  
3640 W. Lincoln Street  
Phoenix, AZ 85009  
Attn: David Friedman  
Email: DFriedman@FriedmanRecycling.com

Notices are deemed received (i) when delivered to the Party, (ii) three (3) business days after being placed in the U.S. Mail, properly addressed, with sufficient postage, (iii) the following business day after being given to a recognized overnight delivery service, with the person giving the notice paying all required charges and instructing the delivery service to deliver on the following business day, or (iv) when received by email transmission during the normal business hours of the recipient. If a copy of a notice is also given to a Party's counsel or other recipient, the provisions above governing the date on which a notice is deemed to have been received by a Party will mean and refer to the date on which the Party, and not its counsel or other recipient to which a copy of the notice may be sent, is deemed to have received the notice.

12.12. Confidentiality of Records. Contractor must establish and maintain procedures and controls that are acceptable to the City for the purpose of ensuring that information contained in its records or obtained from the City or from others in carrying out its obligations under this Agreement will not be used or disclosed by it, its agents, officers, or employees, except as required to perform Contractor's duties under this Agreement. Persons requesting such information should be referred to the City. Contractor also agrees that any information pertaining to individual persons will not be divulged other than to employees, agents, or officers of the Contractor as needed for the performance of duties under this Agreement.

12.13. Public Records. Notwithstanding any provisions of this Agreement regarding confidentiality, secrets, or protected rights, Contractor acknowledges that all documents provided to the City may be subject to disclosure by laws related to open public records. Consequently, Contractor understands that disclosure of some or all of the items subject to this Agreement may be required by law. In the event the City receives a request for disclosure that is reasonably calculated to incorporate information that might be considered confidential by Contractor, the City agrees to provide Contractor with notice of that request. Within ten (10)

days of such notice, Contractor must inform the City in writing of any objection by Contractor to the disclosure of the requested information. Failure by Contractor to timely object will waive Contractor's ability to object under this section and will waive any remedy against the City for disclosure. In the event Contractor objects to disclosure within the time specified, Contractor agrees to handle all aspects related to the request including properly communicating with the requestor and timely responding with information. Furthermore, Contractor agrees to indemnify and hold harmless the City from any claims, actions, lawsuits, or any other controversy or remedy, in whatever form, that arises from the failure to comply with the request for information and the laws pertaining to public records, including defending the City in any legal action and payment of any penalties or judgments assessed against the City. This provision will survive the termination of this Agreement.

- 12.14. Conflicting Terms. In the event of a conflict between the Scope of Work and this Agreement, the terms of this Agreement will govern.
- 12.15. Compliance with Federal Immigration Laws and Regulations. Contractor warrants that it complies with all federal immigration laws and regulations that relate to its employees and that it complies with A.R.S. § 23-214(A). Contractor acknowledges that pursuant to A.R.S. § 41-4401, a breach of this warranty is a material breach of this Agreement subject to penalties up to and including termination of this Agreement, and that the City retains the legal right to inspect the papers of any employee who works pursuant to the Agreement to ensure compliance with this warranty.
- 12.16. Compliance with A.R.S. § 35-393.01. Contractor hereby certifies that it does not, and will not, participate in during the term of this Agreement, a boycott of Israel in accordance with Arizona Revised Statute § 35-393.01. Contractor hereby agrees to indemnify and hold harmless the City, its agents, and employees from any claims or causes of action relating to the City's action based upon reliance upon this representation, including the payment of all costs and attorney fees incurred by the City in defending such an action.
- 12.17. Compliance with A.R.S. § 35-394. Contractor hereby certifies that it does not currently, and agrees for the duration of this Agreement, that Contractor will not, use: i) the forced labor of ethnic Uyghurs in the People's Republic of China; ii) any goods or services produced by the forced labor of ethnic Uyghurs in the People's Republic of China; or iii) any contractors, subcontractors, or suppliers that use the forced labor or any goods or services produced by the forced labor of ethnic Uyghurs in the People's Republic of China.

\_\_\_\_\_ **(Contractor Initial Here)**

Contractor hereby agrees to indemnify and hold harmless the City, its officials, employees, and agents from any claims or causes of action relating to the City's action based upon reliance upon this representation, including the payment of all costs and attorney fees incurred by the City in defending such an action.

\_\_\_\_\_ (Contractor Initial Here)

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement as of the date the last Party signs.

**For the City**

**For Contractor**

By: \_\_\_\_\_

By: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Printed Name: David Friedman

Title: \_\_\_\_\_

Title: CEO

Date: \_\_\_\_\_

Date: \_\_\_\_\_

ATTEST:

\_\_\_\_\_  
City Clerk

APPROVED AS TO FORM:

\_\_\_\_\_  
City Attorney's Office

Notice to Proceed dated \_\_\_\_\_

SCOPE OF WORK  
EXHIBIT A  
TO  
PROFESSIONAL SERVICES AGREEMENT  
BETWEEN  
THE CITY OF FLAGSTAFF, ARIZONA  
AND  
CONTRACTOR

See following pages.

## EXHIBIT A SCOPE OF WORK

Contractor shall provide the following compaction, hauling, and processing of recycling materials for the City (the "Services"):

### 1. CITY FACILITY

Contractor shall pick up the single-stream recycling materials from the City's recycling facility, located at *1800 E. Butler Ave, Flagstaff, Arizona 86001*, or other suitable location as agreed to by both Parties in writing prior to hauling to the alternative location ("City Facility"). The City will provide Contractor the ability to access the City Facility.

### 2. EQUIPMENT

A. The City will use equipment provided or contracted by the City to load the single-stream recycling materials into Contractor's compactors and receiver containers.

B. Compactors. Contractor shall provide two (2) large capacity (4 cubic yard and 5 cubic yard or greater) compactors for the City's use during the term of this Agreement. Contractor shall be responsible for the preparation, installation, configuration, and maintenance of the compactors and supporting equipment (such as guide rails, connecting/safety devices, hydraulic pumps, etc.). City shall provide suitable concrete surface and electrical disconnects to within twenty-five (25) feet of each compactor installation location. The Contractor shall conduct quarterly preventative maintenance on the compactors and associated equipment, and will respond within two (2) working days to evaluate any issues reported by the City. An agreed upon plan to resolve any issues identified during the quarterly preventative maintenance or reported by the City must be determined within two (2) working days. In the event that both compactors are inoperable for longer than two (2) working days, Contractor shall initiate contingency hauling provisions as specified below. Contingency hauling shall at no time extend beyond fifteen (15) working days. Failure to return to normal hauling operations within fifteen (15) working days will result in penalties as specified below.

C. Receiver Containers. Contractor shall provide eight (8) 40 cubic yard receiver containers for the City's use during the term of this Agreement. Additional 40 cubic yard receiver containers may be provided by Contractor upon request of City. The Contractor shall maintain the receiver containers and guiderails in good and safe working condition and will conduct regular preventative maintenance (at least quarterly) and respond within two (2) working days to address any receiver container issues identified by the Contractor or City. Any issues identified with a receiver container that cannot be resolved within two (2) working days, Contractor will replace the damaged container with an operational container at no charge to the City.

D. The compactors and containers furnished hereunder by Contractor (referred to herein collectively as "Equipment") shall remain the property of Contractor; however, City acknowledges that it has care, custody, and control of the Equipment while at the City's

Facility. The City accepts responsibility for all loss or damage to the Equipment, except for normal wear and tear, or for loss or damage resulting from Contractor's handling of the Equipment. The City agrees not to overload (by weight or volume), move, or alter the Equipment (except for the normal swapping/repositioning of the receiver containers), and shall use the Equipment only for its proper and intended purpose.

E. The City warrants that any area provided by the City for Contractor's Equipment location is the most convenient location sufficient to bear the weight of the Equipment. Contractor shall not be responsible for damage to any pavement, curbing, or accompanying sub-surface at the City Facility caused by Contractor's reasonable use of any route reasonably necessary to perform the Services.

### **3. CONTRACTOR FACILITIES**

A. Contractor shall haul the single-stream recycling materials from the City Facility to Contractor's Facility for processing, located at *3640 West Lincoln, Street, Phoenix, Arizona 85009* ("Contractor Facility"), or such other site as may be determined by Contractor and agreed to in writing by the City. City's agreement will not be unreasonably withheld.

B. The costs associated with the transportation of the single-stream recycling materials between designated Facilities are identified below.

C. At no time shall single-stream recycling materials be delivered to a processing site, or other facility, that does not process and recover Recyclables (as defined below) in the manner reasonably similar to methods described within this Agreement. Direct delivery of single-stream recycling materials or Recyclables (as defined below) to a landfill, waste to energy, or incineration facility is strictly prohibited and will be grounds for immediate termination of the Agreement.

### **4. MATERIAL ACCEPTANCE**

A. Contractor will pick up and process the City's residential and commercial single stream recycling materials from the City Facility and transport to Contractor Facility for processing and recovery. Single stream recyclables shall be targeted to include and recover the following material types for recycling:

1. Mixed Paper (#54)
2. Clean Cardboard/Old Corrugated Containers (OCC #11)
3. Plastic #1 PET threaded bottles, jars, and jugs
4. Plastic #2 HDPE Natural threaded bottles, jars, and jugs
5. Plastic #2 HDPE Color threaded bottles, jars, and jugs
6. Plastic #5 Polypropylene tubs and containers
7. Steel/Tin Cans and Containers
8. Aluminum Cans and Containers
9. Mixed Rigid/Bulk Plastics

The Parties may add or remove additional materials to the above-listed material types (hereinafter referred to as “Recyclables”) from time to time as agreed to by both Parties in writing.

Contractor is aware and agrees that non-recyclable materials (hereinafter referred to as “Contaminants”) [e.g., trash, organics, non-Recyclables] will commonly be contained in single-stream recyclables. Contaminants, along with other non-recoverable materials, shall be defined as “Residual.”

B. In order to mitigate environmental, health, and safety risks at the City Facility, the goal of the City is to maintain a clean (i.e., empty) tipping floor at the City Facility at the end of every day of production, typically five (5) days per week from Monday through Friday. Therefore, Contractor must provide consistent and reliable service to meet this goal on a daily basis. Based on the past several months of inbound single-stream recyclables to the City Facility (i.e., an average of 22 tons per day Monday through Friday), the following hauling schedule is needed to maintain sufficient conditions and shall be modified only in writing or in accordance with the exceptions listed below:

1. Contractor shall pickup two (2) full receiver containers from the City Facility and transport to Contractor Facility on Mondays; and
2. Contractor shall pickup four (4) full receiver containers from the City Facility and transport to Contractor Facility on Tuesdays, Wednesdays, Thursdays, and Fridays.
3. Full receiver containers shall be swapped out with empty receiver containers by Contractor during pickup.
4. Contractor shall ensure that all receiver containers have been picked up according to the schedule above from the City facility each day.
5. Contractor shall provide ten (10) receiver containers for use by the City, with the intention that four (4) extra receiver containers will be staged at the City Facility at all times to allow for unforeseen circumstances, such as weather, traffic, or staffing issues, that prevent Contractor from meeting the transportation schedule above.
6. Contractor will not haul on any City observed holidays on which single-stream recyclables are not collected (currently Thanksgiving, Christmas, and New Years Day). To account for the altered hauling schedule, Contractor will haul on the Saturday following the observed holiday. On other City-observed holidays on which single-stream recyclables are collected by the City, Contractor shall haul on those days and be compensated the holiday hauling rate identified below. If Contractor is unable to haul on a holiday, the missed holiday haul will be made up on the following Saturday and Contractor will be compensated the weekend/holiday rate for those hauls.
7. Only weekend hauls required due to City observed holidays discussed in paragraph 6 above, and weekend hauls requested by the City shall be billed at the weekend haul rate. Any weekend hauls required by the Contractor to make up for any missed hauls in the prior week, which only require Contractor to pick up full receiver containers, shall be billed at the normal weekday haul rate. Any weekend hauls required by the Contractor to make up for any missed hauls in the prior week

that require the City to staff the City Facility shall be billed at 50% of the normal weekday haul rate.

City and Contractor may agree to alternative hauling schedules based on changes in volumes of single-stream recyclables or hauling challenges. Any such changes shall be requested by the City in writing. The City agrees to provide unobstructed access to the equipment on the scheduled collection day(s).

#### C. Financial Credits for Insufficient Contractor Hauling

The hauling schedule above requires Contractor to pick up and replace thirty-six (36) receiver containers every two (2) weeks. If at the end of any two (2) consecutive weeks Contractor has failed to meet said hauling schedule, and City has not authorized fewer hauls, City may require financial credits from the Contractor pursuant to the below schedule:

1. For every single receiver container haul not completed within a two-week timeframe as specified above, Contractor shall credit City \$150 as a penalty for not meeting the hauling schedule. Therefore, if four (4) receiver boxes are not hauled by Contractor in accordance with the mutual agreed upon hauling schedule, Contractor would credit City \$600.

The expectation is that if Contractor fails to meet the hauling schedule, additional hauls will be made to account for excess single-stream recyclables on the City Facility's tipping floor. City may agree to waive any penalties as specified above; however, any penalty waivers must be agreed upon in writing.

In the event repeated missed hauls result in the City tipping floor reaching capacity (approximately 100 tons), and unable to reasonably and safely accept additional single-stream recyclables requiring the City to direct haul single-stream recyclables to its landfill, Contractor shall credit City \$1,000 per day plus all applicable landfill tipping fees. The determination of whether the City Facility tipping floor is at capacity is subject to the City's sole discretion.

Financial credits shall be applied during monthly billing cycles.

D. The single-stream recyclables to be hauled by Contractor pursuant to this Agreement shall exclude radioactive, volatile, highly flammable, explosive, biomedical, infectious, toxic, or hazardous material, including electronics and batteries of any type. The term hazardous material shall include but not be limited to any amount of waste listed or characterized as hazardous by the United States Environmental Protection Agency or any state agency pursuant to the Resource Conservation and Recovery Act of 1976, as amended, or applicable state and/or county law.

E. Contractor shall acquire possession of the single-stream recyclables upon delivery of single-stream recyclables to Contractor's Facility and subsequent inspection and acceptance by Contractor. In the event of non-acceptance, Contractor shall notify the City in writing of the reason(s) for non-acceptance. Notice must be provided within 24-hours

of the single-stream recyclables being picked up from the City Facility. Notwithstanding the forgoing, title to and liability for any waste not accepted by Contractor shall remain with the City and City expressly agrees to defend, indemnify and hold harmless Contractor from and against any and all damages, penalties, fines and liabilities resulting from or arising out of such waste. For any waste that is not accepted, Contractor will work with City to properly and safely dispose of the material.

Contractor is responsible for containing and securing single-stream recyclables during transport from City Facility to Contractor Facility. Contractor shall be wholly responsible for cleaning up any single-stream recyclables released into the environment during or after transport to Contractor Facility.

F. Within the next two (2) years, the City will explore baling operations to better compact and more efficiently transport single-stream and clean/source-separated recyclables. No later than six (6) months' prior to a change in operations, City will work with Contractor to develop a revised Agreement.

## **5. PROCESSING**

Single-stream recyclables shall be sorted for the recovery of targeted Recyclables to be packaged and sold as ready-to-use raw materials, or other suitable alternative use, by recycling companies. Depending upon the operational needs of the Contractor, Contractor may elect to sell unsorted or partially sorted single-stream recycling materials to other materials recycling operators for processing. Contractor will document its election to sell unsorted or partially sorted recycling materials to third-parties in the Reporting documents described below.

## **6. LANDFILLING**

A. Contractor shall make commercially reasonable effort to maximize the capture of recoverable Recyclables from the single-stream recycling materials.

B. Recycling materials that are contaminated, disfigured, or deformed such that they cannot be detected/captured by normal industry sorting technology/processes and/or are not recovered after commercially reasonable efforts by Contractor shall be classified as Residual and disposed of at an appropriate landfill.

C. If a specific load(s) of recycling materials contains an excess of 50% contamination and/or containing liquid or hazardous materials, Contractor may divert and/or transfer that load(s) to the landfill ("Rejected Shipment").

D. If Contractor is unable to secure sufficient orders to sell the total quantity of a specific commodity generated within an individual month for two (2) consecutive months, the unsalable quantity of that commodity may be re-classified as Residue, and the material composition schedule and sorting process shall be updated accordingly until such time as a viable end-market able to consume the entire generation is secured.

E. If the volume of recycling materials at Contractor's Facility exceeds safe limits, as determined by City of Phoenix ordinance and/or Contractor's policies and procedures, Contractor will divert City hauls to an alternative Materials Recovery Facility (MRF) and remove the recycling materials from the premises in order to bring inventory levels down to sufficient level to comply with applicable safety policies, procedures, and/or ordinances. The City will pay Friedman standard transportation and processing rates to deliver City single-stream recyclables to alternative MRFs.

In the event that Contractor Facility is expected to be closed for thirty (30) or more days, City may consider alternative hauling companies to transport single-stream recyclables to alternative MRFs.

F. The cost to the City for Contractor to haul the recycling materials to a landfill shall comply with the fees identified in this Agreement. However, if Contractor is unable to secure sufficient orders to sell the total quantity of a specific commodity as contemplated in this Section for a period of greater than one (1) month, Contractor will not charge City any additional fees for hauling and/or processing any recycling materials that are deemed unsalable by Contractor.

G. If Contractor diverts the recycling materials to a landfill and/or suspends deliveries at any time, Contractor shall inform the City in writing within twenty-four (24) hours and shall communicate its best estimate as to when the diversion/suspension will end.

## **7. FEE SCHEDULE**

Contractor shall provide the Services described within this Agreement based upon the following fee schedule:

### **A. Hauling (40 Cubic-Yard Receiver Containers)**

1. The standard hauling fee for hauling two (2), 40 cubic-yard receiver containers is \$1,175 per trip. Each trip consists of dropping off two (2) empty 40 cubic-yard receiver containers and picking up two (2) loaded 40 cubic-yard receiver containers with compacted single-stream recyclables. The standard hauling fee applies to hauls conducted Monday-Friday, excluding holidays.
2. The weekend/holiday hauling fee for hauling two (2), 40 cubic-yard receiver containers is \$1,475 per trip. Each trip consists of dropping off two (2) empty 40 cubic-yard receiver containers and picking up two (2) loaded 40 cubic-yard receiver containers with compacted single-stream recyclables.

### **B. Hauling (53-ft Semi Dry Van Trailers) \***

1. The standard hauling fee for hauling baled single-stream recyclables using 53-ft Semi Dry Van Trailers (or equivalent) is \$925 per trip. Each trip consists of dropping off an empty 53-ft Semi Dry Van Trailer (or equivalent) and picking up a 53-ft Semi Dry Van Trailer (or equivalent) loaded with baled single-stream recyclables. The standard hauling fee applies to hauls conducted on Monday-Friday, excluding holidays.

2. The weekend/holiday hauling fee for hauling baled single-stream recyclables using 53-ft Semi Dry Van Trailers (or equivalent) is \$1,225 per trip. Each trip consists of dropping off an empty 53-ft Semi Dry Van Trailer (or equivalent) and picking up a 53-ft Semi Dry Van Trailer (or equivalent) loaded with baled single-stream recyclables.

\*This section is only applicable if the City switches to a baling operation. Pricing in this section is subject to the CPI adjustments discussed below.

C. Contingency Hauling Option

Contractor shall provide the following contingencies to minimize any impact from hauling delays.

- 1) Contractor shall provide two (2) additional 40yd Receiver containers on site for use by the City at no charge. Total receivers dedicated to the execution of this Agreement shall be ten (10).
- 2) If Contractor is unable to operate its doubles trailers, Contractor shall swap out single receivers at a charge of 50% of the then current double haul rates.
- 3) If Contractor utilizes large bulk trailers (i.e. transfer trailers, end dumps, etc.), Contractor shall charge a rate equal to the then current doubles haul rate divided by 80 (to convert the then current haul charge to cubic yard rate) and multiplied by the cubic yard capacity of the bulk trailer used to perform the haul. As an example, if the current doubles haul rate is \$1,175 then the charge for a contingency haul performed by a 60 cubic yard transfer trailer would be \$881.25.  $[(\$1175 / 80) * 60]$ .

D. Hauling to the Landfill

If necessary, Contractor shall charge a maximum of \$89 per ton to transport and/or dispose of recycling materials at an appropriate landfill if the recycling materials are deemed by the Contractor as a Rejected Shipment.

E. 40 Cubic-Yard Receiver Container Rentals

1. \$199 per receiver container/month.
2. Contractor shall provide ten (10) receiver containers for the City's use; however, City will only pay for eight (8).
3. Additional receiver containers in excess of ten (10) will be provided upon request at a cost of \$199 per month, per receiver container.

**8. REVENUE SHARING/TIP FEE**

A. General

1. The Revenue Share/Tip Fee shall be determined based upon the Average Market Value ("AMV") of the City's recycling materials and the MRF Operating Expense Threshold ("MOET") based upon the following formulas and as defined below:

2. When the AMV equals the MOET, the Revenue Share/Tip Fee shall be zero. (There will be no revenue paid to the City and no tip fee charged to the City.)

3. When the AMV is greater than the MOET, Contractor shall pay the City 60% of the difference between the AMV and the MOET (based upon the attached Schedule A) multiplied by the total tons of Recyclables picked up from the City in that month.

4. When the AMV is less than the MOET, the City shall pay Contractor the total difference between the AMV and the MOET multiplied by the total tons picked up from the City in that month.

B. MRF Operating Expense Threshold

The MOET to be used to calculate the Revenue Share/Tip Fee for the processing of the City's single-stream recycling materials shall be defined as **\$109.00** per ton.

C. Average Market Value

The AMV of the City's recycling materials shall be determined by the weighted average of value based upon the current market price of each individual commodity, as defined by the designated published price index listed below, and multiplied by the percent composition each commodity represents as determined by periodic material composition audits. The indices which shall determine current market price shall be the following:

<u>Commodity</u>	<u>Published Index</u>
Mixed Paper (#54)	RISI/PPI Southwest High Side Price for #54 Mixed Paper LESS \$25/ton.
OCC (#11)	RISI/PPI Southwest High Side Price for #11 OCC LESS \$20/ton.
PETE	80% of the Secondary Materials Pricing.com (www.RecyclingMarkets.net) for Pacific Northwest USA, Regional Average Price for Plastics #1 PET.
HDPE-Natural	80% of the Secondary Materials Pricing.com (www.RecyclingMarkets.net) for Pacific Northwest USA, Regional Average Price for Plastics #2 Natural HDPE.
HDPE-Color	80% of the Secondary Materials Pricing.com (www.RecyclingMarkets.net) for Pacific Northwest USA, Regional Average Price for Plastics #2 Colored HDPE.
Polypropylene	80% of the Secondary Materials Pricing.com (www.RecyclingMarkets.net) for Pacific Northwest USA, Regional Average Price for Plastics PP Post Consumer.
Tin Cans	80% of the Secondary Materials Pricing.com (www.RecyclingMarkets.net) for Pacific Northwest USA, Regional Average Price for Metals Steel Cans, Loose.
Aluminum Cans	80% of the Secondary Materials Pricing.com (www.RecyclingMarkets.net) for Pacific Northwest USA, Regional Average Price for Metals Aluminum Cans, Loose.

Rigid Plastics	80% of the Secondary Materials Pricing.com (www.RecyclingMarkets.net) for Pacific Northwest USA, Regional Average Price for Plastics Mixed Bulky Rigid.
Residual	Charge of \$69 per ton

The price published in the earliest edition/posting of the month shall be used to calculate pricing for the entire month. If a published price index (or indexes) indicated above fails to accurately reflect prevailing market conditions, upon agreement by the City which will not be unreasonably withheld, Contractor may use an alternative publication(s) or alternate method to determine the value of each affected commodity until such time that the published price index listed above returns to accurately reflect prevailing market conditions.

#### D. MRF Processing Fee Examples

##### MRF Processing Fees

- Processing Fee: The Processing Fee is \$109.00 per delivered ton.
- Average Market Value (AMV): The AMV of the City's Recyclables shall be determined by the weighted average of value based upon the current market price of each individual commodity, as defined by the designated published price index listed below, and multiplied by the percent composition each commodity represents as determined by periodic material composition audits.
- The Revenue Share Percentage is determined from Schedule A.

##### MRF Processing Fee Examples

###### Example #1 – Weak Market for Recyclables

- Processing Fee is \$109.00 per ton
- AMV is \$28.86 per ton
- 100 tons delivered
- AMV for all tons = 100 tons x \$28.86 = \$2,886
- Processing Fee for all tons = 100 tons x \$109.00 = \$10,900
- \$2,886 - \$10,900 = (\$8,014)
- City owes Contractor \$8,014

###### Example #2 – Strong Market for Recyclables

- Processing Fee is \$109.00 per ton
- AMV is \$150.00 per ton
- 100 tons delivered
- AMV for all tons = 100 tons x \$150.00 = \$15,000
- Processing Fee for all tons = 100 tons x \$109.00 = \$10,900
- \$15,000 - \$10,900 = \$4,100 available commodity value

- \$4,100 x 60% = \$2,460 (City base rebate)
- Contractor owes City \$2,460

## **9. RECORD KEEPING**

A. Contractor shall create, maintain, and provide records as defined in, and required by, all applicable local, state, and federal laws, rules, and regulations, and maintain any records as are reasonably necessary to document and track the information described herein.

B. Contractor shall maintain and allow access to books, records, data, documents, and reports relating to the Agreement for five (5) years following the conclusion or termination of the Agreement.

## **10. REPORTING**

A. Monthly Reports: By the 15th of each month, Contractor shall submit to the City an electronic report summarizing the records kept for processing the recycling materials during the previous calendar month to include:

1. Net total tons of City single-stream recyclables hauled and processed by Contractor, including delivery destination(s).
2. Total tons by commodity as determined by material composition audits.
3. Any payments due to the City.
4. Updated monthly AMVs.
5. Dates when recycling materials were diverted to another MRF or landfill, as a last resort (delineated as Residual, a Rejected Shipment, or because the recycling materials exceeded safe limits at Contractor's Facility), or was sold to a third-party.

B. Semi-Annual Reports: By the 15<sup>th</sup> of January and July, Contractor shall submit semi-annual reports that include the geographical area where each commodity has been shipped for end market processing for the preceding six (6) months.

## **11. COMPOSITION AUDIT**

A composition audit shall be performed by Contractor within sixty (60) days from execution of the Agreement, unless waived by both Parties. Audits will occur at least twice per year, thereafter. The City's representatives shall be invited to observe each audit with a minimum notice of five (5) business days to the City in writing by Contractor. Audited Recyclables shall be comprised of a representative sample captured from each of the City's routes and days and contain a representative sample size of approximately 50 to 100 tons per audit. Audits shall be scheduled in agreement with the City and Contractor at times to best represent the composition of the City's recyclables. Contractor shall use the City's most current composition audit results for the initial sixty (60) days of the Agreement or until such time as Contractor is able to complete its first composition audit. Composition audit data shall be provided to the City by Contractor in writing once completed no later than five (5) business days after completion of a composition audit.

Contractor shall provide a short narrative report with pictures to the City along with the composition audit data.

## **12. RATE ADJUSTMENTS**

A. For twelve (12) months from the effective date of this Agreement, the rate and/or fees charged by Contractor to the City will remain the same.

B. Beginning on July 1, 2025, and as of the first day of July during each subsequent year during the term of this Agreement, the MOET and all other Contractor charges & fees (haul fees, rental fees, processing fees/MOET, and residual charge) shall be subject to an annual inflation adjustment. Adjustment for inflation shall be limited to the percentage change in the Consumer Price Index ("CPI") for the twelve (12) month period ending the previous December 31st. At no time shall a single annual inflation adjustment exceed eight percent (8%) as per the aforementioned adjustment factors. For purposes of this Agreement, the Consumer Price Index means the West Urban Size A Consumer Price Index for All Urban Consumers (CPI-U-West Region), as published by United States Department of Labor, Bureau of Statistics, from time to time (or the Parties may agree in writing to use a similar index if publication of this particular index is terminated).

C. In addition to annual CPI increases, the MOET and adjustments to the published price indices may be adjusted as a result of an uncontrollable circumstance that would have a material adverse impact on the Contractor's ability to perform under this Agreement. All adjustments shall take effect based upon written approval of the City. Such uncontrollable circumstances may include, but are not limited to, significant increases with Contractor-demonstrated financial impacts in minimum wages, new and/or increased taxes, fees, or surcharges, national disaster, additional and/or altered governmental regulations, restraints by domestic and/or foreign governments, trade policies, etc. Contractor shall notify the City in writing of any such occurrence, setting forth in reasonable detail the uncontrollable circumstance of such occurrence and quantify the financial impact(s). The City and Contractor shall use commercially reasonable efforts to expeditiously mitigate the effects of any uncontrollable circumstance.

## **13. VOLUME**

A. The Fee Schedule presumes Contractor hauls a minimum of three hundred (300) tons per month of the City's single-stream recycling materials. If the City fails to make available for hauling a minimum of three hundred (300) tons of single-stream recycling materials in any single month, Contractor shall charge a minimum tonnage fee adjustment equal to 68% of the then current MOET multiplied by the total quantity of tons below three hundred (300) delivered within that month.

B. Contractor will apply the combined weight of the Residual and Recyclables towards the three hundred (300) minimum tonnage requirement.

## **14. SAFETY STANDARDS**

All items and services supplied in this agreement will comply with the current applicable federal and state Occupational Safety and Health Standards, the National Electric Code, the applicable waste and recycling American National Standards (ANSI), and the National Fire Protection Association Standards. The ANSI Z245 standards committee defines and sets the safety standards for the waste industry.

The Contractor will be responsible for ensuring that the above-referenced safety standards are met and acknowledges that the Contractor has general supervisory authority over the worksite, including the power to correct safety and health violations. This would include the power to require subcontractors to correct violations of the above-mentioned safety standards. The Contractor is responsible for how frequently and closely the Contractor needs to inspect to meet the standard of reasonable care for the above-referenced safety standards.

DRAFT

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Sarah Langley, Public Affairs Director  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



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**TITLE:**

**Consideration and Approval of Letter of Opposition:** Letter of opposition to UNS Electric, Inc. Arizona Power Plant and Transmission Line Siting Committee Application and Appeal to the Arizona Corporation Commission.

**STAFF RECOMMENDED ACTION:**

Retroactively approve the Letter of Opposition.

**Executive Summary:**

The City of Flagstaff's Sustainability Division requested that the Mayor and Council submit a letter of opposition to the Arizona Corporation Commission regarding the UNS Electric, Inc. Arizona Power Plant and Transmission Line Siting Committee Application and Appeal. The Arizona Corporation Commission was scheduled to hear an appeal related to the approval process for new gas peaker plants on Tuesday, June 11. The Sustainability Division noted that this decision could incentivize utilities to build more gas peaker plants without regard for the environmental or health and economic impacts on customers. Adding more gas peaker plants hinders cities' efforts across the state to cut greenhouse gas emissions and build a resilient city for the future. The City's 2024 State Legislative Priorities include the priority of "urging the Arizona Corporation Commission to adopt a statewide clean energy standard that achieves 100% carbon-free energy in our state".

The letter was submitted as a public comment to Docket No. L-00000F-24-0056-00230 on Monday, June 10. Staff is requesting retroactive Council approval of the letter.

**Financial Impact:**

None

**Policy Impact:**

None

**Previous Council Decision or Community Discussion:**

None

**Options and Alternatives to Recommended Action:**

None

**Connection to PBB Priorities and Objectives:**

Facilitate, develop, and encourage carbon-neutral energy opportunities.

**Connection to Regional Plan:**

N/A

**Connection to Carbon Neutrality Plan:**

FS-3: Support fuel switching in existing residential and commercial buildings.

**Connection to 10-Year Housing Plan:**

N/A

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**Attachments:**    Letter of Opposition



# CITY OF FLAGSTAFF

## OFFICE OF THE MAYOR

211 West Aspen Avenue, Flagstaff, Arizona 86001

Main Line: 928-213-2000

Website: <https://www.flagstaff.az.gov>

June 7, 2024

Arizona Corporation Commission  
1200 W Washington St.  
Phoenix, AZ 85007

RE: City of Flagstaff comment letter on the UNS Electric, Inc. Arizona Power Plant and Transmission Line Siting Committee Application and Appeal to the Arizona Corporation Commission.

Dear Chairman O'Connor and Commissioners,

The City of Flagstaff submits this comment letter in response to UNS Electric, Inc Arizona Power Plant and Transmission Line Siting Committee application and appeal to the Arizona Corporation Commission as published in [Docket No. L-00000F-24-0056-00230](#). Thank you for the opportunity to share our input.

The City of Flagstaff asks that you reject UNS Electric's request to create a loophole to avoid environmental reviews and scrutiny regarding the impact of siting large gas power plants. These major facilities must be required to get a Certificate of Environmental Compatibility (CEC), and the Arizona Corporation Commission must allow the AZ Power Plant and Transmission Line Siting Committee to do its job to evaluate the impacts of the proposed plants versus the need for these specific facilities.

The Commission's decision on UNS Electric's request will affect all of Arizona's utilities and developers going forward. The result would be the unchecked development of natural gas power plants in Arizona's communities with no accountability to Arizona's citizens. For fifty years the Line Siting Committee and this Commission has held that the law requires a CEC for facilities which have units that are individually less than 100 MW but collectively over 100 MW. The Commission should not suddenly reject that interpretation of the law.

If UNSE is successful, this sets a concerning precedence. The AZ Power Plant and Line Siting Committee and the Commission would only have authority over transmission lines from now on and the Commission will lose regulatory oversight of gas projects.

The City of Flagstaff urges the Arizona Corporation Commission to affirm the Arizona Power Plant and Transmission Line Siting order and reject UNS Electric's effort to evade a Certificate of Environmental Compatibility for its Black Mountain Generating Station Expansion Project. The Commission should support local government and communities and ensure that utilities are held accountable. Thank you for considering our comments on this important issue.

Best regards,

Becky Daggett,  
Mayor of Flagstaff, on behalf of the Flagstaff City Council

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Ryan Darr, Police Lieutenant  
**Co-Submitter:** Megan Dales  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



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**TITLE:**

**Consideration and Approval of Grant Award Ratification:** Approve the ratification of the U.S. Department of Justice, through the Arizona Criminal Justice Commission, for the Edward Byrne Justice Assistance Grant Agreement in the amount of \$292,485.09 for the Northern Arizona Street Crimes Task Force (METRO Unit).

**STAFF RECOMMENDED ACTION:**

Approve the ratification of the grant agreement from the U.S. Department of Justice, through the Arizona Criminal Justice Commission, Edward Byrne Justice Assistance Grant funds in the amount of \$292,485.09 for FY2024-FY2025.

**Executive Summary:**

The City of Flagstaff was awarded \$292,485.09 in grant funds from the U.S. Department of Justice, through the Arizona Criminal Justice Commission, for the Edward Byrne Justice Assistance Grant funds. This grant fully funds one Flagstaff Police Sergeant, and partially funds one Flagstaff Police investigator, and one Coconino County Sheriff's Deputy investigator. There is no cost to the City of Flagstaff.

Officers in the METRO Unit continuously provide support to numerous community groups including, local schools, Citizens Academy programs, local law enforcement training academies etc. in the form of training and educational presentations, drug awareness, and proactive investigations.

**Financial Impact:**

The grant award is in the amount of \$219,363.82 (75%) with required matching funds of \$73,121.27 (25%). The METRO board has authorized matching funds from the Rico account. The Rico account has provided matching funds in the previous years and the board has agreed to provide the above matching funds for this year's grant. This amount will include all city costs, estimated in kind and administrative costs if above normal departmental allocation. The grant award will be the 37<sup>th</sup> funding cycle (FY 2025) for the METRO unit. This grant is budgeted in Fiscal Year 2024-2025 for \$443,434 in account number 001-04-062-6050-2.

**Policy Impact:**

None

**Previous Council Decision or Community Discussion:**

Yes, the Flagstaff City Council has approved the acceptance of this grant money for the past thirty seven years.

**Options and Alternatives to Recommended Action:**

Approve the ratification of the grant or decline the grant.

**Background and History:**

As previously stated, this is the 37th cycle of this grant in which the Flagstaff City Council has approved the previous 37 cycles.

**Connection to PBB Priorities and Objectives:**

Safe & Healthy Community: Provide public safety services with resources, staff, and training responsive to the community's needs.

**Connection to Regional Plan:**

Effective Governance - Regional Plan (2030) - Planning, Public Safety, Goal PF.3 Provide high-quality emergency response and public safety services. Safe and healthy community: Provide public safety services with resources, staff, and training responsive to the community needs (for 2021)

**Connection to Carbon Neutrality Plan:**

No connection to the Carbon Neutrality Plan

**Connection to 10-Year Housing Plan:**

No connection to Housing plan

**Connection to Division Specific Plan:**

This grant and the investigative officers this funds is supported by nearly every law enforcement entity in Coconino County including the Coconino County Sheriff's Office, The Flagstaff Police Department, Northern Arizona University Police, ATF, FBI, DEA, Homeland Security and the Department of Public Safety. This grant provides specialized police investigations to all the communities located within Coconino County.

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**Attachments:**    [ACJC METRO FY25 Grant Agreement](#)



# Arizona Criminal Justice Commission

May 29, 2024

*Chairperson*

DAVID K. BYERS, Director  
Administrative Office of the Courts

*Vice-Chairperson*

STEVE STAHL  
Law Enforcement Leader

JEAN BISHOP  
Mohave County Supervisor

MICHELLE H. BURNS  
Former Judge

BRADLEY W. CARLYON  
Navajo County Attorney

LAURA CONOVER  
Pima County Attorney

JEFF GLOVER, Director  
Department of Public Safety

KRIS MAYES  
Attorney General

MINA MENDEZ, Chairperson  
Board of Executive Clemency

RACHEL MITCHELL  
Maricopa County Attorney

CHRIS NANOS  
Pima County Sheriff

RUSS SKINNER  
Maricopa County Sheriff

KARA RILEY  
Oro Valley Chief of Police

DAVID SANDERS  
Pima County Chief Probation Officer

ROBERT L. SPIVEY  
St. Johns Chief of Police

RYAN THORNELL, Director  
Department of Corrections,  
Rehabilitation, and Reentry

VACANT  
County Sheriff

VACANT  
Chief of Police

VACANT  
Mayor

*Executive Director*  
Andrew T. LeFevre

1110 West Washington, Suite 230  
Phoenix, Arizona 85007  
PHONE: (602) 364-1146  
FAX: (602) 364-1175  
[www.azcjc.gov](http://www.azcjc.gov)

Attn: Stacey Brechler-Knaggs, Grants and Contracts Manager  
City of Flagstaff  
211 West Aspen  
Flagstaff, AZ 86001

RE: Drug, Gang, and Violent Crime Control (DGVCC) FY 2025 Award, DC-25-002

Dear Stacey Brechler-Knaggs,

On behalf of the Arizona Criminal Justice Commission, it is my pleasure to inform you that your agency's application has been approved for funding under the FY 2025 Drug, Gang, and Violent Crime Control Program.

Paragraphs six and seven of the enclosed agreement provide the amount of funding awarded to your agency and the specific positions that have been funded. Below, please find additional information that will assist in the administration of your agency's grant award.

**Grant Agreement and Other Required Documents:** Please review the grantee agreement and accompanying instructions as revisions or new requirements may have been included. Please follow the directions outlined in the Grant Agreement instructions, as well as instructions received in DocuSign to execute the contract in its entirety with electronic authorized signatures. Agreements not returned within 90 days of the award date with authorized signatures may be canceled. Additionally, please refer to the Special Conditions section of the grant agreement for a listing of other required documents, as applicable.

**Administrative and Financial Requirements:** In addition to applicable uniform administrative requirements and cost principles, award recipients are required to adhere to grant specific program requirements as defined in the grant agreement.

**Reporting:** Activity and financial reports are required for this grant and the reporting schedules are contained in the agreement. Financial Reporting can be accessed at: <https://grantsportal.azcjc.gov/>. Activity reporting can be accessed at: <https://acjcreporting.azcjc.gov/>.

**Office of Civil Rights Requirements:** Annual Completion of Civil Rights Training is required for this grant. Grantees must contact the Grant Coordinator to obtain registration to access the training. If applicable, agencies awarded must complete an EEOC plan and submit it to the Office of Civil Rights, Office of Justice Programs. Link to helpful EEOC information: <https://www.ojp.gov/program/civil-rights-office/home>.

If you have any questions, please contact Siyeni Yitbarek at [siytbarek@azcjc.gov](mailto:siytbarek@azcjc.gov) or 602.364.1163. Our office looks forward to the continued partnership.

Sincerely,

A handwritten signature in black ink that reads "Tony Vidale".

Tony Vidale, Deputy Director  
Drug, Gang, and Violent Crime Control Program



ARIZONA CRIMINAL JUSTICE COMMISSION  
DRUG, GANG, AND VIOLENT CRIME CONTROL  
GRANT AGREEMENT

ACJC Grant Number DC-25-002  
Assistance Listings Number (ALN) Number 16.738

The following information is provided pursuant to 2 §C.F.R. 200.331(a)(1):

Grantee Name: City of Flagstaff  
Grantee's UEI Number: XMMUMPKTLVQ3  
Grantee Period of Performance Start and End Date: 07/01/2024 to 06/30/2025  
Amount of Federal Funds Obligated by this Agreement: \$125,768.58  
Total Amount of Federal Funds Obligated to the Grantee: \$125,768.58  
Indirect Cost Rate used by the Grantee under this Agreement: 0.0%  
ALN Number and Name: 16.738 - Edward Byrne Memorial Justice Assistance Grant (JAG) Program  
Name of Federal Awarding Agency: Department of Justice, Office of Justice Programs  
Total Amount of the Federal Award in this Agreement: \$4,183,559.00  
Federal Award Identification Number (FAIN): 15PBJA-22-GG-00662-JAGX  
Federal Award Date: 09/13/2021

Federal Award Project Description:

In general, JAG funds awarded to a state under this FY2025 solicitation may be used to provide additional personnel, equipment, supplies, contractual support, training, technical assistance, and information systems for criminal justice, including for any one or more of the following:

- Law enforcement programs
- Prosecution and court programs
- Prevention and education programs
- Corrections and community corrections programs
- Drug treatment and enforcement programs
- Planning, evaluation, and technology improvement programs
- Crime victim and witness programs (other than compensation)
- Mental health programs and related law enforcement and corrections programs

Name of Pass-Through Entity: Arizona Criminal Justice Commission  
Contact Information for Pass-Through Entity: Arizona Criminal Justice Commission, 1110 W. Washington Street,  
Suite 230, Phoenix, AZ, 85007  
Identification of Whether the Award is Research and Development: No  
Indirect Cost Rate for the Federal Award: 0.0%

This Grant Agreement is made this 29th day of May, 2024 by and between the ARIZONA CRIMINAL JUSTICE COMMISSION hereinafter called "COMMISSION" and COCONINO, through CITY OF FLAGSTAFF hereinafter called GRANTEE. The COMMISSION enters into this Agreement pursuant to its authority under the provisions of A.R.S. § 41-2405 (B)(6), and having satisfied itself as to the qualification of GRANTEE;

NOW, THEREFORE, it is agreed between the parties as follows:

1. This Agreement will commence on July 01, 2024 and terminate on June 30, 2025. This Agreement expires at the end of the award period unless prior written approval for an extension has been obtained from the COMMISSION. A request for an extension must be received by the COMMISSION sixty (60) days prior to the end of the award period. The COMMISSION in its sole discretion may approve an extension that furthers the goals and objectives of the program and shall determine the length of any extension.
2. GRANTEE agrees that grant funds will be used in accordance with applicable program rules, guidelines and special conditions.
3. The COMMISSION will monitor GRANTEE performance against program goals and performance standards and those outlined in the grant application. Substandard performance as determined by the COMMISSION will constitute noncompliance with this Agreement. If the COMMISSION finds noncompliance, the GRANTEE will receive a written notice which identifies the area of noncompliance, and the appropriate corrective action to be taken. If the GRANTEE does not respond within thirty (30) calendar days to this notice, and does not provide sufficient information concerning the steps which are being taken to correct the problem, the COMMISSION may suspend funding, permanently terminate this Agreement or revoke the grant.
4. Any deviation or failure to comply with the purpose and/or conditions of this Agreement without prior written COMMISSION approval may constitute sufficient reason for the COMMISSION to terminate this Agreement, revoke the grant, require the return of all unspent funds, perform an audit of expended funds, and require the return of any previously spent funds which are deemed to have been spent in violation of the purpose or conditions of this grant.
5. This Agreement may be modified only by a written amendment signed by the Executive Director or by persons authorized by the Executive Director on behalf of the COMMISSION and GRANTEE. Any notice given pursuant to this Agreement shall be in writing and shall be considered to have been given when actually received by the following addressee or their agents or employees:

A. If to the COMMISSION:

Arizona Criminal Justice Commission  
1110 W Washington St., Ste 230  
Phoenix, Arizona 85007

Attn: Program Manager

B. If to the GRANTEE:

City of Flagstaff  
211 West Aspen  
Flagstaff, AZ 86001

Attn: Grants and Contracts Manager , Stacey Brechler-Knaggs

6. For grant awards above \$100,000, GRANTEE may make budget adjustments of up to ten (10) percent of the total grant within any approved budget category excluding equipment. Written approval from the COMMISSION in advance is required if GRANTEE wishes to make adjustments or reprogram in excess of ten (10) percent or if GRANTEE wishes to purchase equipment not previously approved.

For grant awards less than \$100,000, the GRANTEE may make budget adjustments within approved categories excluding equipment as long as there are no changes to the purpose or scope of the project. If GRANTEE wishes to purchase equipment not previously approved, written approval from the COMMISSION in advance is required.

### APPROVED LINE ITEM PROGRAM BUDGET

<b>PERSONAL SERVICES</b>	
Salaries	\$133,993.45
Fringe Benefits*	\$100,501.24
<b>OVERTIME</b>	
Wages	\$0.00
Fringe Benefits*	\$0.00
<b>PROFESSIONAL CONSULTANT &amp; CONTRACTUAL SERVICES</b>	
Wages	\$57,990.40
Fringe Benefits*	\$0.00
<b>TRAVEL EXPENSES</b>	
In-State Travel	\$0.00
Out-of-State Travel	\$0.00
<b>EQUIPMENT</b>	
Capital	\$0.00
Non-Capital	\$0.00
<b>OPERATING EXPENSES</b>	
Supplies	\$0.00
Registration/Training	\$0.00
Other Operating Expenses	\$0.00
Confidential Funds	\$0.00
Additional Expenses	\$0.00
<b>TOTAL BUDGET</b>	<b>\$292,485.09</b>

POSITIONS FUNDED: Flagstaff PD Sergeant (1), Flagstaff Investigator (.73)

EQUIPMENT FUNDED:

7. The total to be paid by the COMMISSION under this Agreement shall not exceed \$125,768.58 in federal funds awarded to the COMMISSION by the U.S. Department of Justice (USDOJ), Office of Justice Programs (OJP) and \$93,595.24 in State Funds. If this grant has a matching requirement, GRANTEE understands that other federal grant funds cannot be used as a match for this grant. The matching amount for this award is \$73,121.27.

8. Every payment obligation of the COMMISSION under this Agreement is conditioned upon the availability of funds appropriated or allocated for the payment of such obligation. If funds are not allocated and available for the continuance of this Agreement, this Agreement may be terminated by the COMMISSION. No liability shall accrue to the COMMISSION in the event this provision is exercised, and the COMMISSION shall not be obligated or liable for any future payments or for any damages as a result of termination under this paragraph.

9. GRANTEE agrees that if it currently has an active award of federal funds or if it receives any other award of federal funds during the period of performance for this award, and those award funds have been, are being or are to be used, in whole or in part, for one or more of the identical cost items for which funds are being provided under this award, GRANTEE will promptly notify, in writing, the COMMISSION, of the potential of duplication, and if so requested by the COMMISSION, seek a budget modification or change-of-project-scope grant adjustment request (GAR) to eliminate any inappropriate duplication of funding.

10. GRANTEE agrees to retain all books, account reports, files and other records, (paper and/or electronic) relating to this Agreement and the performance of this Agreement for no less than five (5) years from the last financial report submitted to the COMMISSION. All such documents shall be subject to inspection and audit at reasonable times, including such records of any subgrantee, contractor, or subcontractor. GRANTEE also understands and agrees that USDOJ and the United States General Accounting Office (USGAO) are authorized to interview any officer or employee of the GRANTEE (or of any subgrantee, contractor, or subcontractor) regarding transactions related to this award.

11. GRANTEE agrees that activities funded under this award will be closely coordinated with related activities supported with Office of Justice Programs (OJP), State, local or tribal funds. Grant funds may only be used for the purposes in the GRANTEE's approved application. GRANTEE shall not undertake any work or activities not described in the grant application, including staff, equipment, or other goods or services without prior approval from the COMMISSION.

12. GRANTEE agrees to track, account for, and report on all funds (including specific outcomes and benefits) separately from all other funds for the same or similar purposes or programs.

Accordingly, the accounting systems of GRANTEE and all subgrantees must ensure that funds from this award are not commingled with funds from any other source.

13. GRANTEE agrees to abide by Federal and State laws and provide accounting, auditing and monitoring procedures to safeguard grant funds and keep such records to assure proper fiscal controls, management and the efficient disbursement of grant funds.

14. For the purposes of this grant, a capital expenditure means expenditures to acquire capital assets, as defined in 2 C.F.R. 200.12, or expenditures to make additions, improvements, modifications, replacements, rearrangements, reinstallations, renovations, or alterations to capital assets that materially increase their value or useful life, with a cost of \$5,000 or greater. If the GRANTEE's capitalization policy defines a capital expenditure as less than \$5,000, the GRANTEE will follow its own policy.

15. GRANTEE agrees to maintain property records for equipment purchased with grant funds and perform a physical inventory and reconciliation with property records at least every two years or more frequently if required by GRANTEE policy. GRANTEE agrees that funds will not be used for the construction of new facilities.

16. GRANTEE agrees to follow equipment disposition policies outlined in 2 C.F.R. 200.313(e)(1) through (4) *Uniform Administrative Requirements for Grants and Cooperative Agreements-Equipment*, when the equipment is no longer needed for the grant program **Link:** [e-CFR Navigation Aid](http://www.ecfr.gov/cgi-bin/ECFR?page=browse) at <http://www.ecfr.gov/cgi-bin/ECFR?page=browse>.

17. GRANTEE agrees that all salaried personnel (including subgrantee personnel) whose activities are to be charged to the award will maintain timesheets or certifications to document hours worked for activities related to this award and non-award related activities. GRANTEE agrees to keep time and attendance sheets for hourly employees signed by the employee and supervisory official having firsthand knowledge of the work performed by the grant-funded employees.

18. GRANTEE agrees that it will submit financial and activity reports to the COMMISSION in a format provided by the COMMISSION, documenting the activities supported by these grant funds and providing an assessment of the impact of these activities which may include documentation of project milestones. In the event reports are not received on or before the indicated date(s), funding may be suspended until such time as delinquent report(s) are received.

19. These reports are to be submitted according to the following schedule(s):

### ACTIVITY REPORTS

Report Period	Due Date
July 1st to September 30th	October 15th
October 1st to December 31st	January 15th
January 1st to March 31st	April 15th
April 1st to June 30th	July 15th

### FINANCIAL REPORTS

Report Period	Due Date
July 1st to July 31st	August 25th
August 1st to August 31st	September 25th
September 1st to September 30th	October 25th
October 1st to October 31st	November 25th
November 1st to November 30th	December 25th
December 1st to December 31st	January 25th
January 1st to January 31st	February 25th
February 1st to February 28/29th	March 25th
March 1st to March 31st	April 25th
April 1st to April 30th	May 25th
May 1st to May 31st	June 25th
June 1st to June 30th	July 25th

Additional reporting requirements may be required for GRANTEES who are considered high risk.

20. GRANTEE understands that financial reports are required as an accounting of expenditures for either reimbursement or COMMISSION-approved advance payments.

21. The final request for reimbursement of grant funds must be received by the COMMISSION no later than sixty (60) days after the last day of the award period.

22. All goods and services must be received or have reasonable expectations thereof and placed in service by GRANTEE by the expiration of this award.

23. GRANTEE agrees that all encumbered funds must be expended and that goods and services must be paid by GRANTEE within sixty (60) days of the expiration of this award.

24. GRANTEE agrees to remit all unexpended grant funds to the COMMISSION within thirty (30) days of written request from the COMMISSION.

25. GRANTEE agrees to account for interest earned on federal grant funds and shall manage interest income in accordance with the Cash Management Improvement Act of 1990 and as indicated in the Office of Justice Programs Financial Guide. Interest earned in excess of allowable limits must be remitted to the COMMISSION within 30 days after receipt of a written request from the COMMISSION. **Link:** [OJP Financial Guide](https://ojp.gov/financialguide/doj/pdfs/DOJ_FinancialGuide.pdf) at [https://ojp.gov/financialguide/doj/pdfs/DOJ\\_FinancialGuide.pdf](https://ojp.gov/financialguide/doj/pdfs/DOJ_FinancialGuide.pdf).

26. GRANTEE agrees to obtain written COMMISSION approval for all sole source procurements in excess of \$250,000.

27. GRANTEE agrees to obtain written COMMISSION approval prior to the expenditure of grant funds for consultant fees in excess of \$650 per day.

28. GRANTEE agrees to not use federal grant funds to pay cash compensation (salary plus bonuses) to any employee paid by the grant at a rate that exceeds 110% of the maximum annual salary payable to a member of the federal government's Senior Executive Service (SES) at an agency with a Certified SES Performance Appraisal System for that year. (An award recipient may compensate an employee at a higher rate, provided the amount in excess of this compensation limitation is paid with non-federal funds, unless otherwise noted in the grant solicitation.)

29. GRANTEE agrees not to use grant funds for food and/or beverage unless explicitly approved in writing by the COMMISSION.

30. GRANTEE agrees to comply with all applicable laws, regulations, policies and guidance (including specific cost limits, prior approvals and reporting requirements, where applicable) governing the use of grant funds for expenses related to conferences, meetings, trainings, and other events, including the provision of food and/or beverages at such events, and costs of attendance at such events unless explicitly approved in writing by the COMMISSION. Information on pertinent laws, regulations, policies, and guidance is available in the OJP Financial Guide (currently, as section 3.10 "Postaward Requirements" in the DOJ Grants Financial Guide).

31. No funds shall be used to supplant federal, state, county or local funds that would otherwise be made available for such purposes. Supplanting means the deliberate reduction of state or local funds because of the existence of any grant funds.

32. GRANTEE assigns to the COMMISSION any claim for overcharges resulting from antitrust violations to the extent that such violations concern materials or services applied by third parties to GRANTEE in exchange for grant funds provided under this Agreement.

33. The parties agree to use arbitration in the event of disputes in accordance with the provisions of A.R.S. § 12-1501-12-1518. The laws of the State of Arizona apply to questions arising under this Agreement and any litigation regarding this Agreement must be maintained in Arizona courts, except as pertaining to disputes which are subject to arbitration.

I. In the event of a dispute, controversy, or claim arising out of or relating in any way to the Agreement, the complaining Party shall notify the other Party in writing thereof. Within 30 calendar days of such notice, representatives of both Parties shall meet at an agreed location to attempt to resolve the dispute in good faith. Should the dispute not be resolved within 30 calendar days after such notice, the complaining Party shall seek remedies exclusively through arbitration, in accordance with the provisions of A.R.S. § 12-1501 through 12-1518.

II. The arbitration demand must be a clear and concise statement of the claim or dispute. The respondent's answer and any counterclaims must be filed within 20 calendar days of service of the demand.

III. The arbitration shall be conducted in Maricopa County.

IV. The arbitration shall be conducted by one arbitrator. If the Parties are not able to agree upon the selection of an arbitrator, within 20 calendar days of the commencement of an arbitration proceeding by service of a demand for arbitration, the court on application of a Party shall appoint the arbitrator.

V. The arbitrator must promptly set a conference to clarify the claims and defenses, to establish fair procedures, and to set a schedule for completing the arbitration.

VI. It is the intent of the parties that, barring extraordinary circumstances, arbitration proceedings will be concluded with 120 calendar days from the date the arbitrator is appointed. The arbitrator may extend the time limit in the interests of justice. Failure to adhere to this time limit shall not constitute a basis for challenging the award.

VII. The arbitrator must issue a written, reasoned award within 20 calendar days from the date the hearing is formally closed, or as soon after that as is feasible. The sole remedy will be actual damages; no punitive damages are allowed.

VIII. Unless the arbitrator orders otherwise, the Parties must share arbitration costs equally, including arbitrator's fees and expenses. Each party must pay its own expenses and attorney's fees.

34. GRANTEE understands that grant funds may not be released until all delinquent reports and reversion of funds from prior grants are submitted to the COMMISSION.

35. GRANTEE agrees that grant funds are not to be expended for any indirect costs that may be incurred by GRANTEE for administering these funds unless explicitly approved in writing by the COMMISSION. This may include, but is not limited to, costs for services such as accounting, payroll, data processing, purchasing, personnel, and building use which may have been incurred by the GRANTEE.

36. Each party (as "Indemnitor") agrees to defend, indemnify, and hold harmless the other party (as "Indemnitee") from and against any and all claims, losses, liability, costs, or expenses, (including reasonable attorney's fees) (hereinafter collectively referred to as "Claims") arising out of bodily injury of any person (including death) or property damage, but only to the extent that such Claims which result in vicarious/derivative liability to the Indemnitee are caused by the act, omission, negligence, misconduct, or other fault of the Indemnitor, its officers, officials, agents, employees, or volunteers. If the GRANTEE is a State agency, board, commission, or university of the State of Arizona, this paragraph shall not apply.

37. Should GRANTEE utilize a contractor(s) and subcontractor(s) the indemnification clause between GRANTEE and its contractor(s) and subcontractor(s) shall include the following:

Contractor shall defend, indemnify, and hold harmless the GRANTEE and the State of Arizona, and any jurisdiction or agency issuing any permits for any work arising out of this Agreement, and its departments, agencies, boards, commissions, universities, officers, officials, agents, and employees (hereinafter referred to as "Indemnitee") from and against any and all claims, actions, liabilities, damages, losses, or expenses (including court costs, attorneys' fees, and costs of claim processing, investigation and litigation) (hereinafter referred to as "Claims") for bodily injury or personal injury (including death), or loss or damage to tangible or intangible property caused, or alleged to be caused, in whole or in part, by the negligent or willful acts or omissions of the contractor or any of the directors, officers, agents, or employees or subcontractors of such contractor. This indemnity includes any claim or amount arising out of or recovered under the Workers' Compensation Law or arising out of the failure of such contractor to conform to any federal, state or local law, statute, ordinance, rule, regulation or court decree. It is the specific intention of the parties that the Indemnitee shall, in all instances, except for Claims arising solely from the negligent or willful acts or omissions of the Indemnitee, be indemnified by such contractor from and against any and all claims. It is agreed that such contractor will be responsible for primary loss investigation, defense and judgment costs where this indemnification is applicable. Additionally on all applicable insurance policies, contractor and its subcontractors shall name the State of Arizona, and its departments, agencies, boards, commissions, universities, officers, officials, agents, and employees as an additional insured and also include a waiver of subrogation in favor of the State. Insurance requirements for any contractor used by GRANTEE are incorporated herein by this reference and attached to this Agreement as Exhibit "A".

38. Restrictions and certifications regarding non-disclosure agreements and related matters

No GRANTEE under this award, or entity that receives a procurement contract or subcontract with any funds under this award, may require any employee or contractor to sign an internal confidentiality agreement or statement that prohibits or otherwise restricts, or purports to prohibit or restrict, the reporting (in accordance with law) of waste, fraud, or abuse to an investigative or law enforcement representative of a federal department or agency authorized to receive such information.

The foregoing is not intended, and shall not be understood by the agency making this award, to contravene requirements applicable to Standard Form 312 (which relates to classified information), Form 4414 (which relates to sensitive compartmented information), or any other form issued by a federal department or agency governing the nondisclosure of classified information.

I. In accepting this award, the GRANTEE--

a. represents that it neither requires nor has required internal confidentiality agreements or statements from employees or contractors that currently prohibit or otherwise currently restrict (or purport to prohibit or restrict) employees or contractors from reporting waste, fraud, or abuse as described above; and

b. certifies that, if it learns or is notified that it is or has been requiring its employees or contractors to execute agreements or statements that prohibit or otherwise restrict (or purport to prohibit or restrict), reporting of waste, fraud, or abuse as described above, it will immediately stop any further obligations of award funds, will provide prompt written notification to the federal agency making this award, and will resume (or permit resumption of) such obligations only if expressly authorized to do so by that agency.

II. If the GRANTEE does or is authorized under this award to make subawards ("subgrants"), procurement contracts, or both--

a. it represents that--

(1) it has determined that no other entity that the recipient's application proposes may or will receive award funds (whether through a subaward ("subgrant"), procurement contract, or subcontract under a procurement contract) either requires or has required internal confidentiality agreements or statements from employees or contractors that currently prohibit or otherwise currently restrict (or purport to prohibit or restrict) employees or contractors from reporting waste, fraud, or abuse as described above; and

(2) it has made appropriate inquiry, or otherwise has an adequate factual basis, to support this representation; and

b. it certifies that, if it learns or is notified that any subrecipient, contractor, or subcontractor entity that receives funds under this award is or has been requiring its employees or contractors to execute agreements or statements that prohibit or otherwise restrict (or purport to prohibit or restrict), reporting of waste, fraud, or abuse as described above, it will immediately stop any further obligations of award funds to or by that entity, will provide prompt written notification to the federal agency making this award, and will resume (or permit resumption of) such obligations only if expressly authorized to do so by that agency.

39. GRANTEE agrees to notify the COMMISSION within ten (10) days in the event that the project official is replaced during the award period.

40. No rights or interest in this Agreement shall be assigned by GRANTEE without prior written approval of the COMMISSION.

41. GRANTEE will comply with the audit requirements of Uniform Guidance (2 CFR 200 subpart F 200.500) and provide the COMMISSION with the audit report and any findings within 90 days of receipt of such finding. If the report contains no findings, the GRANTEE must provide notification that the audit was completed. **Link:** [Audit Requirements for OJP Awards](https://ojp.gov/funding/pdfs/AuditRequirementsPart200.pdf) at <https://ojp.gov/funding/pdfs/AuditRequirementsPart200.pdf>.

42. GRANTEE certifies that it will comply with the Uniform Administrative Requirements, Cost Principles, and Audit Requirements in 2 C.F.R. Part 200, as adopted and supplemented by DOJ in 2 C.F.R. Part 2800 (together, the "Part 200 Uniform Requirements") and the OJP Financial Guide. **Link:** [2 C.F.R Part 200 for OJP Awards](https://ojp.gov/funding/Part200UniformRequirements.htm) at <https://ojp.gov/funding/Part200UniformRequirements.htm> .

43. Compliance with general appropriations-law restrictions on the use of federal funds for awards made after FY 2018. GRANTEE or sub-grantee at any tier, must comply with all applicable restrictions on the use of federal funds set out in federal appropriations statutes. Should a question arise as to whether a particular use of federal funds by a GRANTEE would or might fall within the scope of an appropriations-law restriction, the recipient is to contact OJP for guidance, and may not proceed without the express prior written approval of OJP. Pertinent restrictions, including from various "general provisions" in the [Consolidated Appropriations Act, 2018](https://www.ojp.gov/funding/Explore/FY22AppropriationsRestrictions.htm) at <https://www.ojp.gov/funding/Explore/FY22AppropriationsRestrictions.htm> .

44. GRANTEE agrees that it cannot use any federal funds, either directly or indirectly, in support of any contract or sub award to either the Association of Community Organizations for Reform Now (ACORN) or its subsidiaries, without the express written approval of the Office of Justice Programs through the COMMISSION.

45. GRANTEE understands and agrees that misuse of award funds may result in a range of penalties, including suspension of current and future funds, suspension or debarment from federal grants, recoupment of monies provided under an award, and civil and/or criminal penalties.

46. GRANTEE agrees not to do business with any individual, agency, company or corporation listed in the Excluded Parties Listing Service. **Link:** [System for Award Management](https://www.sam.gov/SAM/) at <https://www.sam.gov/SAM/> .

47. GRANTEE agrees to ensure that, no later than the due date of the GRANTEE's first financial report after the award is made, GRANTEE and any subgrantees have a valid DUNS profile and active registration with the System for Award Management (SAM) database.

48. GRANTEE certifies that it presently has no financial interest and shall not acquire any financial interest, direct or indirect, which would conflict in any manner or degree with the performance of services required under this Agreement.

49. GRANTEE understands and agrees that any training or training materials developed or delivered with funding provided under this award must adhere to the OJP Training Guide Principles for Grantees and Subgrantees. **Link:** [OJP Training Guide Principles for Grantees and Subgrantees](https://www.ojp.gov/funding/implement/training-guiding-principles-grantees-and-subgrantees) at <https://www.ojp.gov/funding/implement/training-guiding-principles-grantees-and-subgrantees>.

50. GRANTEE agrees to cooperate and participate with any and all assessments, evaluation efforts or information and data collection requests, and acknowledges that the federal or state grantor agency has the right to obtain, reproduce, publish or use data provided under this award and may authorize others to receive and use such information.

51. GRANTEE shall provide the COMMISSION with a copy of all interim and final reports and proposed publications (including those prepared for conferences and other presentations) resulting from this Agreement. Submission of such materials must be prior to or simultaneous with their public release.

52. GRANTEE agrees that any publications (written, visual, or sound) excluding press releases and newsletters, whether published at the GRANTEE'S or COMMISSION'S expense, shall contain the following statement:

"This was supported by Award No. 15PBJA-22-GG-00662-JAGX awarded by the Department of Justice, Office of Justice Programs, Office of Justice Programs, U.S. Department of Justice. The opinions findings, and conclusions or recommendations expressed in this publication/program/exhibition are those of the author(s) and do not necessarily reflect the views of the Department of Justice."

53. GRANTEE shall comply with all federal, state, and local laws, rules, policies, or executive orders to prohibit discrimination.

54. GRANTEE agrees to comply with the non-discrimination requirements of the Omnibus Crime Control and Safe Streets Act (Safe Streets Act) of 1968, as amended, 34 U.S.C. § 10228(c); the Victims of Crime Act of 1984, as amended, 34 U.S.C. § 20110(e); the Juvenile Justice and Delinquency Prevention Act of 1974, as amended, 34 U.S.C. § 11182(b); and VAWA, as amended, 34 U.S.C. § 12291(b)(13), contain prohibitions against discrimination on the basis of religion in employment. Despite these nondiscrimination provisions, the DOJ has concluded that it may construe the Religious Freedom Restoration Act (RFRA) on a case-by-case basis to permit some faith-based organizations to receive DOJ funds while taking into account religion when hiring staff, even if the statute that authorizes the funding program generally forbids recipients from considering religion in employment decisions. Please consult with the OCR if you have any questions about the regulation or the application of RFRA to the statues that prohibit discrimination in employment. An organization that is a recipient of financial assistance subject to the nondiscrimination provisions of the Safe Streets Act, must meet two obligations: (1) complying with the federal regulation pertaining to the development of an EEO (see 28 C.F.R. pt. 42, subpt. E) and (2) submitting to the OCR findings of discrimination (see 28 C.F.R. §§ 42.204(c), .205(c)(5)). If in the three years prior to the date of the grant award a Federal or State Court or Federal or State administrative agency makes a finding of discrimination after a due process hearing against GRANTEE, GRANTEE will forward a copy of the findings to the Office for Civil Rights, Office of Justice Programs and the COMMISSION.

55. In accordance with DOJ guidance pertaining to Title VI of the Civil Rights Act of 1964, 42 U.S.C. § 2000d, recipients of federal financial assistance must take reasonable steps to provide meaningful access to their programs and activities for persons with limited English proficiency (LEP). See U.S. Department of Justice, Guidance to Federal Financial Assistance Recipient Regarding Title VI Prohibition Against National Origin Discrimination Affecting Limited English Proficient Persons, 67 Fed. Reg. 41,455 (2002). For more information on the civil rights responsibilities that recipients have in providing language services to LEP individuals, please see the website: **Link:** [Limited English Proficiency A Federal Interagency Website](http://www.LEP.gov) at <http://www.LEP.gov>.

56. GRANTEE agrees to comply with the applicable requirements of 28 CFR Part 38, the Department of Justice regulation governing "Partnerships with Faith - Based and Other Neighborhood Organizations" (the "PFNBO"). The PFNBO Regulation provides in part that Department of Justice financial assistance may not be used to fund any inherently religious activities, such as worship, religious instruction, or proselytization. Recipients of Department of Justice financial assistance may still engage in inherently religious activities, but such activities must be separate in time or place from the Department of Justice funded program, and participation in such activities by individuals receiving services from GRANTEE must be voluntary. The PFNBO Regulation also makes clear that organizations participating in programs receiving financial assistance from the Department of Justice are not permitted to discriminate in the provision of services on the basis of a beneficiary's religion. Notwithstanding any other special condition of this award, faith-based organizations may, in some circumstances, consider religion as a basis for employment. **Link:** <https://ojp.gov/funding/Explore/SolicitationRequirements/CivilRightsRequirements.htm#NDPFaith>.

57. Requirements pertaining to prohibited conduct related to trafficking in persons (including reporting requirements and OJP authority to terminate award)

The GRANTEE or subgrantee at any tier, must comply with all applicable requirements (including requirements to report allegations) pertaining to prohibited conduct related to the trafficking of persons, whether on the part of recipients, GRANTEES, or individuals defined (for purposes of this condition) as "employees" of the recipient or of any GRANTEE.

The details of the recipient's obligations related to prohibited conduct related to trafficking in persons are posted on the OJP web site at <http://ojp.gov/funding/Explore/ProhibitedConduct-Trafficking.htm> (Award condition: Prohibited conduct by recipients and GRANTEES related to trafficking in persons (including reporting requirements and OJP authority to terminate award)), and are incorporated by reference here.

58. GRANTEE should be mindful that the misuse of arrest or conviction records to screen either applicants for employment or employees for retention or promotion may have a disparate impact based on race or national origin, resulting in unlawful employment discrimination. As of June 2013 OJP has issued an advisory that grantees should consult local counsel in reviewing their employment practices. If warranted, grantees should also incorporate an analysis of the use of arrest and conviction records in their Equal Employment Opportunity Plan (EEO). See Advisory for Recipients of Financial Assistance from the U.S. Department of Justice on the U.S. Equal Employment Opportunity Commission's Enforcement Guidance: Consideration of Arrest and Conviction Records in Employment Decisions Under Title VII of the Civil Rights Act of 1964 (June 2013), available at [http://www.ojp.gov/about/ocr/pdfs/UseofConviction\\_Advisory.pdf](http://www.ojp.gov/about/ocr/pdfs/UseofConviction_Advisory.pdf).

59. GRANTEE assures that it will comply with all state and federal laws regarding privacy during the course of the award. All information relating to clients is to be treated with confidentiality in accordance with 42 USC section 3789g or 42 USC 14132(b)(3) that are applicable to the collection, disclosure, use and revelation of data information. GRANTEE further agrees to submit a privacy Certificate that is in accordance with requirements of 28 CFR Part 22 if applicable to the program.

60. GRANTEE agrees to formulate and keep on file an EEO (if GRANTEE is required pursuant to 28 CFR 42 Subpart E). GRANTEE certifies that they have forwarded to the Office for Civil Rights, Office of Justice Programs the EEO, or certifications that they have prepared and have on file an EEO, or that they are exempt from EEO requirements. Failure to comply may result in suspension of grant funds. Copies of all submissions such as certifications to or correspondence with the Office for Civil Rights, Office of Justice Programs regarding this requirement must be provided to the COMMISSION by GRANTEE. In the event a federal or state court or federal or state administrative agency makes an adverse finding of discrimination against GRANTEE after a due process hearing, on the ground of race, color, religion, national origin, or sex, GRANTEE will forward a copy of the findings to the Office for Civil Rights, Office of Justice Programs and the COMMISSION (see 28 CFR 42.204(c), .205(c)(5)).

61. GRANTEE agrees to participate in any required civil rights related training to ensure compliance with all federal and state civil rights laws. GRANTEE will inform the COMMISSION of the position responsible for civil rights compliance and will inform the COMMISSION of change in personnel responsible for civil rights compliance within ten days. **Link:** <https://www.azcjc.gov/Grants/Civil-Rights-Compliance>.

62. Compliance with 41 U.S.C. 4712 (including prohibitions on reprisal; notice to employees) GRANTEE must comply with, and is subject to, all applicable provisions of 41 U.S.C. 4712, including all applicable provisions that prohibit, under specified circumstances, discrimination against an employee as reprisal for the employee's disclosure of information related to gross mismanagement of a federal grant, a gross waste of federal funds, an abuse of authority relating to a federal grant, a substantial and specific danger to public health or safety, or a violation of law, rule, or regulation related to a federal grant. GRANTEE also must inform its employees, in writing (and in the predominant native language of the workforce), of employee rights and remedies under 41 U.S.C. 4712. Should a question arise as to the applicability of the provisions of 41 U.S.C. 4712 to this award, the recipient is to contact the DOJ awarding agency (OJP or OVW, as appropriate) for guidance.

63. To support public safety and justice information sharing, GRANTEE, if a governmental subdivision, shall use the National Information Exchange Model (NIEM) specifications and guidelines for this grant. GRANTEE shall publish and make available without restrictions all schemas generated as a result of this grant to the component registry as specified in the guidelines. **Link:** <http://niem.github.io/reference/specifications/>.

64. In order to promote information sharing and enable interoperability among disparate systems across the justice and public safety community, OJP requires the grantee to comply with DOJ's Global Justice Information Sharing Initiative (DOJ's Global) guidelines and recommendations for this particular grant. Grantee shall conform to the Global Standards Package (GSP) and all constituent elements, where applicable, as described at [https://it.ojp.gov/gsp\\_grantcondition](https://it.ojp.gov/gsp_grantcondition).

Grantee shall document planned approaches to information sharing and describe compliance to the GSP and appropriate privacy policy that protects shared information, or provide detailed justification for why an alternative approach is recommended.

65. To avoid duplicating existing networks or IT systems in any initiatives for law enforcement information sharing systems which involve interstate connectivity between jurisdictions, such systems shall employ, to the extent possible, existing networks as the communication backbone to achieve interstate connectivity, unless GRANTEE can demonstrate to the satisfaction of the COMMISSION that this requirement would not be cost beneficial or would impair the functionality of an existing or proposed IT system.

66. If GRANTEE is a governmental political subdivision, the GRANTEE should, to the extent possible and practical, share criminal justice information with other authorized criminal justice agencies. The process control number (PCN) shall be used in accordance with A.R.S. § 41-1750 when sharing data with other criminal justice agencies as electronic data systems are developed or improved.

67. If GRANTEE is a state agency and the award is for the development of information technology projects for more than \$25,000, GRANTEE must complete a Project Investment Justification (PIJ) and submit the justification to the Arizona Department of Administration (ADOA), with a copy to the COMMISSION. GRANTEE agrees to submit required project status reports to ADOA by the due dates and submit copies to the COMMISSION.

If GRANTEE is not a state agency and the award is for the development of information technology projects, GRANTEE will follow local technology policies and guidelines.

68. GRANTEE must promptly refer to the COMMISSION any credible evidence that a principal, employee, agent, contractor, subgrantee, contractor, subcontractor, or other person has, in connection with funds under this award, has either 1) submitted a false claim that violates the False Claims Act; or 2) committed a criminal or civil violation of laws pertaining to fraud, conflict of interest, bribery, gratuity, or similar misconduct. The COMMISSION shall forward the referral to the Department of Justice, Office of the Inspector General.

69. The COMMISSION encourages GRANTEE to establish workplace safety policies and conduct education, awareness and other outreach to decrease crashes caused by distracted drivers, including adopting and enforcing policies banning employees from text messaging while driving any vehicle during the course of performing work funded by this grant. Executive Order 13513, "Federal Leadership on Reducing Text Messaging While Driving," 74 Fed. Reg. 51225 (October 2009).

70. GRANTEE certifies to comply with the Drug-Free Workplace Act of 1988, and implemented in 28 CFR Part 83, Subpart F, for grantees, as defined in 28 CFR, Part 83 Sections 83.620 and 83.650.

71. GRANTEE agrees to complete and keep on file, as appropriate, Immigration and Naturalization Form (I-9). This form is to be used by recipients to verify that persons are eligible to work in the United States. Additionally GRANTEE ensures compliance with A.R.S. § 41-4401.

72. GRANTEE acknowledges that immigration laws require them to register and participate with the E-Verify program (employment verification program administered by the United States Department of Homeland Security and the Social Security Administration or any successor program) as they both employ one or more employees in this state. GRANTEE warrants that they have registered with and participate with E-Verify. If the COMMISSION later determines that the GRANTEE has not complied with E-Verify, it will notify the non-compliant GRANTEE by certified mail of the determination and of the right to appeal the determination.

73. GRANTEE certifies that no federal funds will be paid, by or on behalf of, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into any cooperative agreement, and for the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan or cooperative agreement. If any funds other than Federal funds are paid or will be paid to any person for influencing or attempting to influence an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal award, grant loan, or cooperative agreement, the GRANTEE will complete and submit to the COMMISSION Standard Form-LLL, "Disclosure Form to Report Lobbying" in accordance with its instructions.

74. GRANTEE understands and agrees that it cannot use any federal funds, either directly or indirectly, in support of the enactment, repeal, modification or adoption of any law, regulation or policy at any level of government, without the express prior written approval of the Commission.

75. GRANTEE agrees that no funds provided, or personnel employed under this Agreement shall be in any way, or to any extent, engaged in conduct of political activities in violation of USC Title 5, Part II, Chapter 15, section 1502.

76. GRANTEE understands and agrees that award funds may not be used to discriminate against or denigrate the religious or moral beliefs of students who participate in programs for which financial assistance is provided from those funds, or of the parents or legal guardians of such students.

77. GRANTEE understands and agrees that- (a) no award funds may be used to maintain or establish a computer network unless such network blocks the viewing, downloading and exchanging or pornography, and (b) nothing in subsection (a) limits the use of funds necessary for any Federal, State, tribal or local law enforcement agency or any other entity carrying out criminal investigations, prosecution, or adjudication activities.

78. GRANTEE agrees to comply with all federal, state and local environmental laws and regulations applicable to the development and implementation of activities to be funded under this award. Additional requirements may be found in Grant Agreement Continuation Sheet.

79. GRANTEE agrees that all gross income earned by the GRANTEE that is directly generated by a supported activity or earned as a result of this award during the period of performance shall be deemed program income. All program income must be accounted for and used for the purpose under the conditions applicable for the use of funds under this award, including the effective edition of the OJP Financial Guide and, as applicable in 2 C.F.R. Part 200 Uniform Requirements.

80. This Agreement is subject to cancellation pursuant to the provision of A.R.S. § 38-511. This Agreement may also be cancelled at the COMMISSION'S discretion if not returned with authorized signatures to the COMMISSION within 90 days of commencement of the award.

81. If any provision of this Agreement is held invalid, the remainder of the Agreement shall not be affected thereby and all other parts of this Agreement shall be in full force and effect.

82. GRANTEE agrees to comply with all Special Condition(s) included with this Agreement on the Grant Agreement Continuation Sheet.

83. GRANTEE understands that grant funds may not be released until GRANTEE is compliant with all requirements of grant agreement.

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**ARIZONA CRIMINAL JUSTICE COMMISSION**  
**DRUG, GANG, AND VIOLENT CRIME CONTROL**  
**GRANT AGREEMENT CONTINUATION SHEET**  
**SPECIAL CONDITION(S)**

ACJC Grant Number DC-25-002

1. GRANTEE must verify the Agency Official, Financial Official, Project Official, and Authorized Official including telephone number and e-mail address. If any information is incorrect or has changed, a Grant Adjustment Request (GAR) must be submitted via the ACJC Grants Portal to document changes. In addition, the Agency Point of Contact for the grant record must assign the Financial Points of Contact and the Program Points of Contact in the Grants Portal prior to payments being made and update those contacts when necessary.

2. GRANTEE must submit the following documents within 45 days of award. Failure to submit the documents will result in a hold of grant funding. Documents must be submitted through the GRANTEE's Grants Portal "Attachment" section.

a. ACJC Subgrantee Self-Assessment Questionnaire can be completed in Grants portal at:  
<https://grantsportal.azcjc.gov/>

b. Benchmark Worksheet can be submitted through Grants Portal at: <https://grantsportal.azcjc.gov/>

c. For any agency that is eligible to receive income as a result of grant-funded activities, it must complete the ACJC program income worksheet on Grants Portal under Manage Personnel.

Before the COMMISSION may transmit Federal funds from FY 2022 Byrne/JAG grant the GRANTEE is required to submit the properly executed certification and assurance by the Chief Executive of the Applicant Government.

d. Certifications and Assurances by the Chief Executive of the Applicant Government. Failure to submit the certification will result in a hold of Federal funds. Certification can be obtained at:  
<https://bja.ojp.gov/doc/fy-22-local-jag-ce-certification.pdf>

3. GRANTEE agrees to comply with the requirements of 28 C.F.R. Part 46 and all Office of Justice Programs policies and procedures regarding the protection of human research subjects, including obtainment of Institutional Review Board approval, if appropriate, and subject informed consent.

4. GRANTEE agrees to comply with all confidentiality requirements of 34 U.S.C. and 28 C.F.R. Part 22 that are applicable to collection, use, and revelation of data or information. GRANTEE further agrees, as a condition of grant approval, to submit a Privacy Certificate that is in accord with requirements of 28 C.F.R. Part 22 and, in particular, section 22.23.

5. GRANTEE ensures that it uses generally accepted laboratory practices and procedures as established by accrediting organizations or appropriated certifying bodies.

6. Absent prior express written approval from the COMMISSION, rates for any lodging charged to the grant may not exceed the posted GSA rate for the location. If the GRANTEE opts to obtain lodging at a higher rate, the cost differential, including associated taxes may not be charged to the award.

7. GRANTEE acknowledges that OJP reserves a royalty-free, non-exclusive, and irrevocable license to reproduce, publish, or otherwise use, and authorize others to use (in whole or in part, including in connection with derivative works), for Federal purposes: (1) any work subject to copyright developed under an award or subaward; and (2) any rights of copyright to which a recipient or subrecipient purchases ownership with Federal support.

8. GRANTEE agrees to comply with the Government Performance and Results Act (Pub. L. No. 103-62) and the GRPA Modernization Act of 2010 (Pub. L. No. 111-352). Performance for current year award is measured by: 1) percent reduction in the average number of days from the submission of a sample to a forensic science laboratory to the delivery of test results to a requesting office or agency (calculated by reporting the average

## SPECIAL CONDITION(S) (Continued):

number of days to process a sample at the beginning of a grant period versus the average number of days to process a sample at the end of the grant period; 2) percent reduction in the number of backlogged forensic cases (calculated by reporting the number of backlogged forensic cases at the beginning of the award period versus the number of backlogged forensic cases at the end of the award period), if applicable to the grant; and 3) number of forensic science or medical examiner personnel who completed appropriate training or educational opportunities with current year Coverdell funds, if applicable to the award. GRANTEE is required to collect and report data relevant to these measures.

9. GRANTEE understands and agrees that program income earned during the award period and expenditures from program income must be reported on the monthly financial report. These funds are subject to audit. Program income that is earned during the final sixty (60) days of the award period, if appropriate, be obligated and expended for permissible uses during the sixty-day (60-day) period following the award period. Any program income that is earned, but not obligated or expended within sixty (60) days of the end of the award period must be returned to the COMMISSION.

10. GRANTEE agrees that within 120 days of award, for any law enforcement task force funded with these funds, the task force commander, agency executive, task force officers and other task force members of equivalent rank, will complete required online (internet-based) task force training to be provided free of charge through BJA's Center for Task Force Integrity and Leadership ([www.ctfli.org](http://www.ctfli.org)). Task force members need only take the training once every four years. GRANTEE will compile and maintain a task force personnel roster and course completion certificates.

11. Quarterly performance metrics reports must be submitted through BJA's Performance Measurement Tool (PMT) website (<https://ojpsso.ojp.gov/>) and ACJC Reporting tool website (<https://acjcreporting.azcjc.gov/>). For more detailed information on reporting and other JAG requirements, refer to the AJG reporting requirements webpage. Failure to submit required JAG reports by established deadlines may result in the freezing of grant funds and future High Risk designation.

12. Any law enforcement agency receiving direct or sub-awarded JAG funding must submit quarterly accountability metrics data related to training that officers have received on the use of force, racial and ethnic bias, de-escalation of conflict, and constructive engagement with the public.

13. GRANTEE assures if they are a state agency that the State Information Technology Point of Contact receive written notification regarding any information technology project funded by this grant. GRANTEE agrees to keep on file documentation showing that it has met this requirement.

14. GRANTEE agrees and understands that funded activities may require the preparation of an Environmental Assessment (EA) as defined by the Council of Environmental Quality's Regulations for implementing the Procedural Provisions of the National Environmental Policy Act (NEPA), found at 40 CFR Part 1500.

15. GRANTEE agrees to comply with all federal, state and local environmental laws and regulations applicable to the development and implementation of activities to be funded under this award. The GRANTEE agrees and understands that complying with NEPA may require the preparation of an Environmental Assessment and/or an Environmental Impact Statement, as directed by BJA. The GRANTEE further understands and agrees to requirements for implementation of a Mitigation Plan, as detailed at <https://www.bja.gov/Funding/nepa.html> for programs relating to methamphetamine laboratory operations.

16. GRANTEE agrees that any information technology system developed or supported by funds will comply with 28 CFR Part 23, Criminal Intelligence Systems Operating Policies, if OJP determines this regulation be applicable. Should OJP determine 28 CFR Part 23 to be applicable, OJP may at its discretion, perform audits of the system, as per 28 CFR 23.20(g). Should any violation of 28 CFR Part 23 occur, GRANTEE may be fined as per 42 USC 3789g(c)-(d). GRANTEE may not satisfy such a fine with federal funds.

17. GRANTEE agrees that no JAG funds may be expended on unmanned aircraft, unmanned aircraft systems, or aerial vehicles (US, UAS, or UAV) without prior express written approval from Commission.

## SPECIAL CONDITION(S) (Continued):

18. If JAG Program funds will be used for DNA testing of evidentiary materials, any resulting eligible DNA profiles must be uploaded to the Combined DNA Index System (CODIS, the national DNA database operated by the Federal Bureau of Investigation (FBI)) by a government DNA lab with access to CODIS. No profiles generated with JAG funding may be entered into any other non-governmental DNA database without prior express written approval from BJA. For more information, refer to the NIJ DNA Backlog Reduction Program, available at [www.nij.gov/topics/forensics/lab-operations/evidence-backlogs/Pages/backlogreduction-program.aspx](http://www.nij.gov/topics/forensics/lab-operations/evidence-backlogs/Pages/backlogreduction-program.aspx).

19. Unreasonable restrictions on competition und the award; association with federal government

SCOPE. This condition applies with respect to any procurement of property or services that is funded (in whole or in part) by this award, regardless of the dollar amount of the purchase or acquisition, the method of procurement, or the nature of any legal instrument used. The provisions of this condition must be among those included in any award.

1. No discrimination, in procurement transactions, against associates of the federal government

Consistent with the (DOJ) Part 200 Uniform Requirements - including as set out at 2 C.F.R. 200.300 (requiring awards to be "manage[d] and administer[ed] in a manner so as to ensure that Federal funding is expended and associated programs are implemented in full accordance with U.S. statutory and public policy requirements") and 200.319(a) (generally requiring "[a]ll procurement transactions [to] be conducted in a manner providing full and open cometition 'and forbidding practices "restrictive of competition," such as "[p]lacing unreasonable requirements on firms in order for them to qualify to do business' and taking "[a]ny arbitrary action in the procurement process") -no the basis of such person or entity's status as an "associate of the federal government" (or on the basis of such person or entity's status as a 200.319(a) or as specifically authorized by USDOJ.

2. Rules of construction

a. The term "associate of the federal government" means any person or entity engaged or employed (in the past or at the present) by or on behalf of the federal government- as an employee, contractor or subcontractor (at any tier), grant recipient or- subgrantee (at any tier), agenty, or otherwise- in undertaking any work, project, or activity for or on behalf of (or in providing goods or services to or on behalf of) the federal government, and includes any applicant for such employment or engagement, and any person or entity committed by legal instrument to undertake any such work project, or activity (or to provide such goods or services) in future.

b. Nothing in this condition shall be understood to authorize or require any grantee, any subgrantee at any tier, or any person or other entity, to violate any federal law, including any applicable civil rights or nondiscrimination law.

20. GRANTEE must comply with all applicable requirements to obtain specific advance approval to use a noncompetitive approach in any procurement contract that would exceed the Simplified Acquisition Threshold (currently, \$250,000). The details of the requirement for advance approval to use a noncompetitive approach in a procurement contract under an OJP award are posted on the OJP web site at <https://ojp.gov/funding/Explore/NoncompetitiveProcurement.htm>.

21. GRANTEE acknowledges the requirements of the award; remedies for non-compliance or for materially false statements. The conditions of this award are material requirements of the award. Compliance with any certifications or assurances submitted by or on behalf of the recipient that relate to conduct during the period of performance also is a material requirement of this award.

Failure to comply with any or more of these award requirements-whether a condition set out in full below, a condition incorporated by the reference below, or a certification or assurance related to conduct during the award period may result in the Office of Justice Programs ("OJP") taking appropriate action with respect to the recipient and the award. Among other things, the OJP may withhold finds, disallow costs, or suspend or terminate the award. The Department of Justice ("DOJ"), including OJP, also may take other legal action as appropriate.

Any materially false, fictitious, or fraudulent statement to the federal government related to this award (or concealment or omission of a material fact) may be the subject of criminal prosecution (including under 18

## SPECIAL CONDITION(S) (Continued):

U.S.C 1001 and/or 1621, and/or 34 U.S.C. 10271-10273), and also may lead to imposition of civil penalties and administrative remedies for false claims or otherwise (including under 31 U.S.C 3729-3730 and 3801-3812).

Should any provision of a requirement of this award be held to be invalid or unenforceable by its terms, that provision shall first be applied with limited construction so as to give it the maximum effect permitted by law. Should it be held, instead, that the provision is utterly invalid or unenforceable, such provision shall be deemed severable from this award.

22. If the recipient is designated "high risk" by a federal grant-making agency currently or at any time during the period of performance under this award, the GRANTEE must disclose that fact and certain related information to the COMMISSION by e-mail at dcaadmin@azcjc.gov. For purposes of this disclosure, high risk includes any status under which a federal awarding agency provides additional oversight due to the GRANTEE'S past performance, or other programmatic or financial concerns with the GRANTEE. The GRANTEE'S disclosure must include the following: 1. The federal awarding agency that currently designates the GRANTEE high risk, 2. The date the GRANTEE was designated high risk, 3. The high-risk point of contact at that federal awarding agency (name, phone number, and e-mail address), and 4. The reasons for the high-risk status as set out by the federal awarding agency.

23. Consonant with federal statutes that pertain to firearms and background checks -- including 18 U.S.C. 922 and 34 U.S.C. ch. 409 -- if the GRANTEE uses this award to fund (in whole or in part) a specific project or program (such as a law enforcement, prosecution, or court program) that results in any court dispositions, information, or other records that are "eligible records" (under federal or State law) relevant to the National Instant Background Check System (NICS), or that has as one of its purposes the establishment or improvement of records systems that contain any court dispositions, information, or other records that are "eligible records" (under federal or State law) relevant to the NICS, the GRANTEE must ensure that all such court dispositions, information, or other records that are "eligible records" (under federal or State law) relevant to the NICS are promptly made available to the NICS or to the "State" repository/database that is electronically available to (and accessed by) the NICS, and -- when appropriate -- promptly must update, correct, modify, or remove such NICS relevant "eligible records". In the event of minor and transitory non-compliance, the GRANTEE may submit evidence to demonstrate diligent monitoring of compliance with this condition. COMMISSION will give great weight to any such evidence in any express written determination regarding this condition.

24. GRANTEE acknowledges JAG funds may not be used as the 50% match for purposes of the DOJ Bulletproof Vest Partnership (BVP) program.

25. GRANTEE must have written procedures in place to respond in the event of an actual or imminent "breach" (OMB M-17-12) if it 1) creates, collects, uses, processes, stores, maintains, disseminates, discloses, or disposes of "personally identifiable information (PII)" (2 CFR 200.79) within the scope of an OJP grant-funded program or activity, or 2) uses or operates a "Federal information system" (OMB Circular A-130). The GRANTEE'S breach procedures must include a requirement to report actual or imminent break of PII to the COMMISSION no later than 24 hours after an occurrence of an actual breach, or the detection of an imminent breach.

26. The GRANTEE warrants its compliance with all federal immigration laws and regulations that relate to its employees and A.R.S. § 23-214(A). If a grantee uses any subcontractors in performance of this contract, subcontractors shall warrant their compliance with all federal immigration laws and regulations that relate to their employees and A.R.S. § 23-214(A). A breach of this warranty shall be deemed a material breach of the contract subject to penalties up to and including termination of this contract. The Commission retains the legal right to inspect the papers of the grantee and its subcontractors who work on the contract to ensure that it or its subcontractors are complying with this warranty.

Authorized Official Initials: \_\_\_\_\_

IN WITNESS WHEREOF, the parties have made and executed the Agreement the day and year first above written.

**FOR GRANTEE:**

\_\_\_\_\_  
Authorized Signatory Date

\_\_\_\_\_  
Printed Name & Title

\_\_\_\_\_  
Additional signature(s) if required by political subdivision Date

\_\_\_\_\_  
Printed Name & Title

ATTEST:  
\_\_\_\_\_  
Clerk Date

**Note:** If applicable, the Agreement must be approved by the appropriate county supervisory board or municipal council and appropriate local counsel (i.e., county or city attorney). Furthermore, if applicable, resolutions and meeting minutes must be forwarded to the Commission with the signed Agreement.

**Approved as to form and authority to enter into Agreement:**

\_\_\_\_\_  
Legal Counsel for GRANTEE Date

\_\_\_\_\_  
Printed Name & Title

**Statutory or other legal authority to enter into Agreement:**

\_\_\_\_\_  
Appropriate A.R.S., Ordinance, or Charter Reference

**FOR CRIMINAL JUSTICE COMMISSION:**

\_\_\_\_\_  
Andrew T. LeFevre, Executive Director Date  
Arizona Criminal Justice Commission



## ARIZONA CRIMINAL JUSTICE COMMISSION GRANT AGREEMENT

### INSURANCE REQUIREMENTS EXHIBIT "A"

**Insurance Requirements for Governmental Parties to a Grant Agreement:**

None.

**Insurance Requirements for Any Contractors Used by a Party to the Grant Agreement:**

*(Note: this applies only to Contractors used by a governmental entity, not to the governmental entity itself.)*  
The insurance requirements herein are minimum requirements and in no way limit the indemnity covenants contained in the Intergovernmental Agreement. The State of Arizona in no way warrants that the minimum limits contained herein are sufficient to protect the governmental entity or Contractor from liabilities that might arise out of the performance of the work under this Contract by the Contractor, his agents, representatives, employees or subcontractors, and Contractor and the governmental entity are free to purchase additional insurance.

**A. MINIMUM SCOPE AND LIMITS OF INSURANCE:** Contractor shall provide coverage with limits of liability not less than those stated below.

**1. Commercial General Liability - Occurrence Form**

Policy shall include bodily injury, property damage, and broad form contractual liability.

General Aggregate	\$2,000,000
Products – Completed Operations Aggregate	\$1,000,000
Personal and Advertising Injury	\$1,000,000
Fire Legal Liability	\$50,000
Each Occurrence	\$1,000,000

a. The policy shall be endorsed, as required by this written agreement, to include the State of Arizona, and its departments, agencies, boards, commissions, universities, officers, officials, agents, and employees as additional insureds with respect to liability arising out of the activities performed by or on behalf of the Contractor.

(Note that the other governmental entity(ies) is/are also required to be additional insured(s) and they should supply the Contractor with their own list of persons to be insured.)

b. Policy shall contain a waiver of subrogation endorsement, as required by this written agreement, in favor of the State of Arizona, and its departments, agencies, boards, commissions, universities, officers, officials, agents, and employees for losses arising from work performed by or on behalf of the Contractor.

**2. Business Automobile Liability**

Bodily Injury and Property Damage for any owned, hired, and/or non-owned vehicles used in the performance of this Contract.

Combined Single Limit (CSL)	\$1,000,000
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a. The policy shall be endorsed, as required by this written agreement, to include the State of Arizona, and its departments, agencies, boards, commissions, universities, officers, officials, agents, and employees as additional insureds with respect to liability arising out of the activities performed by or on behalf of, the Contractor involving automobiles owned, hired and/or non-owned by the Contractor.

b. Policy shall contain a waiver of subrogation endorsement as required by this written agreement in favor of the State of Arizona, and its departments, agencies, boards, commissions, universities, officers, officials, agents, and employees for losses arising from work performed by or on behalf of the Contractor.

(Note that the other governmental entity(ies) is/are also required to be additional insured(s) and they should supply the Contractor with their own list of persons to be insured.)

Exhibit "A" Page 2

### 3. Worker's Compensation and Employers' Liability

Workers' Compensation	Statutory
Employers' Liability	
Each Accident	\$1,000,000
Disease - Each Employee	\$1,000,000
Disease - Policy Limit	\$1,000,000

a. Policy shall contain a waiver of subrogation endorsement, as required by this written agreement, in favor of the State of Arizona, and its departments, agencies, boards, commissions, universities, its officers, officials, agents, and employees for losses arising from work performed by or on behalf of the Contractor.

b. This requirement shall not apply to each contractor or subcontractor that is exempt under A.R.S. § 23-901, and when such contractor or subcontractor executes the appropriate waiver form (Sole Proprietor or Independent Contractor).

#### **Additional Insurance Requirements:**

The policies shall include, or be endorsed to include, as required by this written agreement, the following provisions:

The Contractor's policies shall stipulate that the insurance afforded the Contractor shall be primary and that any insurance carried by the Department, its agents, officials, employees or the State of Arizona shall be excess and not contributory insurance, as provided by A.R.S. § 41-621 (E).

Insurance provided by the Contractor shall not limit the Contractor's liability assumed under the indemnification provisions of this Contract.

#### **Notice of Cancellation:**

For each insurance policy required by the insurance provisions of this Contract, the Contractor must provide to the State of Arizona, within two (2) business days of receipt, a notice if a policy is suspended, voided, or cancelled for any reason. Such notice shall be mailed, emailed, hand delivered or sent by facsimile transmission to (Enter Contracting Agency Representative's Name, Address, and Fax Number Here).

#### **Acceptability of Insurers:**

Contractor's insurance shall be placed with companies licensed in the State of Arizona or hold approved non-admitted status on the Arizona Department of Insurance List of Qualified Unauthorized Insurers. Insurers shall have an "A.M. Best" rating of not less than A- VII. The State of Arizona in no way warrants that the above-required minimum insurer rating is sufficient to protect the Contractor from potential insurer insolvency.

#### **Verification of Coverage:**

Contractor shall furnish the State of Arizona with certificates of insurance (valid ACORD form or equivalent approved by the State of Arizona) as required by this Contract. An authorized representative of the insurer shall sign the certificates.

All certificates and endorsements, as required by this written agreement, are to be received and approved by the State of Arizona before work commences. Each insurance policy required by this Contract must be in effect at, or prior to, commencement of work under this Contract. Failure to maintain the insurance policies as required by this Contract, or to provide evidence of renewal, is a material breach of contract.

All certificates required by this Contract shall be sent directly to the Department. The State of Arizona project/contract number and project description shall be noted on the certificate of insurance. The State of Arizona reserves the right to require complete copies of all insurance policies required by this Contract at any time.

Exhibit "A" Page 3

**Subcontractors:**

Contractor's certificate(s) shall include all subcontractors as insureds under its policies or Contractor shall be responsible for ensuring and/or verifying that all subcontractors have valid and collectable insurance as evidenced by the certificates of insurance and endorsements for each subcontractor. All coverages for subcontractors shall be subject to the minimum Insurance Requirements identified above. The Department reserves the right to require, at any time throughout the life of the Contract, proof from the Contractor that its subcontractors have the required coverage.

**Approval and Modifications:**

The Contracting Agency, in consultation with State Risk, reserves the right to review or make modifications to the insurance limits, required coverages, or endorsements throughout the life of this contract, as deemed necessary. Such action will not require a formal Contract amendment but may be made by administrative action.

**Exceptions:**

In the event the Contractor or subcontractor(s) is/are a public entity, then the Insurance Requirements shall not apply. Such public entity shall provide a certificate of self-insurance. If the Contractor or subcontractor(s) is/are a State of Arizona agency, board, commission, or university, none of the above shall apply.

END OF GRANT AGREEMENT DOCUMENTS

**Certificate Of Completion**

Envelope Id: D51A91ACD9544473A4A6B0746D40DFD9	Status: Sent
Subject: Please DocuSign: FY 2025 Drug Program Grant Agreement	
Source Envelope:	
Document Pages: 23	Signatures: 0
Certificate Pages: 5	Initials: 0
AutoNav: Enabled	Envelope Originator:
Envelopeld Stamping: Enabled	Rhaja Beck
Time Zone: (UTC-07:00) Arizona	rbeck@azcjc.gov
	IP Address: 174.73.129.85

**Record Tracking**

Status: Original	Holder: Rhaja Beck	Location: DocuSign
5/30/2024 12:47:12 PM	rbeck@azcjc.gov	
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**Signer Events**

Signature	Timestamp
Marianne Sullivan msullivan@flagstaffaz.gov Security Level: Email, Account Authentication (None)	Sent: 6/14/2024 9:19:40 AM

**Electronic Record and Signature Disclosure:**  
 Accepted: 7/10/2023 2:39:14 PM  
 ID: c1b6f694-1ddf-47a9-a64b-54869419b457  
 Company Name: Arizona Criminal Justice Commission

Greg Clifton  
greg.clifton@flagstaffaz.gov  
Security Level: Email, Account Authentication (None)

**Electronic Record and Signature Disclosure:**  
 Not Offered via DocuSign

Andrew LeFevre  
alefevre@azcjc.gov  
Security Level: Email, Account Authentication (None)

**Electronic Record and Signature Disclosure:**  
 Not Offered via DocuSign

**In Person Signer Events**

Signature	Timestamp

**Editor Delivery Events**

Status	Timestamp
Stacey Brechler-Knaggs sknaggs@flagstaffaz.gov Security Level: Email, Account Authentication (None)	Sent: 5/30/2024 1:10:28 PM Viewed: 6/6/2024 8:16:38 AM Completed: 6/14/2024 9:19:40 AM



Using IP Address: 207.246.9.250

**Electronic Record and Signature Disclosure:**  
 Accepted: 6/6/2024 8:16:38 AM  
 ID: 3661f976-608a-4d94-bcb1-2c205bf37b38  
 Company Name: Arizona Criminal Justice Commission

**Intermediary Delivery Events**

Status	Timestamp

**Certified Delivery Events**

Status	Timestamp

<b>Carbon Copy Events</b>	<b>Status</b>	<b>Timestamp</b>
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Stacey Brechler-Knaggs  
sknaggs@flagstaffaz.gov  
Security Level: Email, Account Authentication  
(None)

**Electronic Record and Signature Disclosure:**  
Accepted: 6/6/2024 8:16:38 AM  
ID: 3661f976-608a-4d94-bcb1-2c205bf37b38  
Company Name: Arizona Criminal Justice Commission

<b>Witness Events</b>	<b>Signature</b>	<b>Timestamp</b>
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<b>Notary Events</b>	<b>Signature</b>	<b>Timestamp</b>
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<b>Envelope Summary Events</b>	<b>Status</b>	<b>Timestamps</b>
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Envelope Sent	Hashed/Encrypted	5/30/2024 1:10:28 PM
Envelope Updated	Security Checked	5/30/2024 2:33:34 PM
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Envelope Updated	Security Checked	6/14/2024 9:19:40 AM
Envelope Updated	Security Checked	6/14/2024 9:19:40 AM
Envelope Updated	Security Checked	6/14/2024 9:19:40 AM

<b>Payment Events</b>	<b>Status</b>	<b>Timestamps</b>
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<b>Electronic Record and Signature Disclosure</b>
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## **ELECTRONIC RECORD AND SIGNATURE DISCLOSURE**

From time to time, Arizona Criminal Justice Commission (we, us or Company) may be required by law to provide to you certain written notices or disclosures. Described below are the terms and conditions for providing to you such notices and disclosures electronically through the DocuSign system. Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction and agree to this Electronic Record and Signature Disclosure (ERSD), please confirm your agreement by selecting the check-box next to 'I agree to use electronic records and signatures' before clicking 'CONTINUE' within the DocuSign system.

### **Getting paper copies**

At any time, you may request from us a paper copy of any record provided or made available electronically to you by us. You will have the ability to download and print documents we send to you through the DocuSign system during and immediately after the signing session and, if you elect to create a DocuSign account, you may access the documents for a limited period of time (usually 30 days) after such documents are first sent to you. After such time, if you wish for us to send you paper copies of any such documents from our office to you, you will be charged a \$0.00 per-page fee. You may request delivery of such paper copies from us by following the procedure described below.

### **Withdrawing your consent**

If you decide to receive notices and disclosures from us electronically, you may at any time change your mind and tell us that thereafter you want to receive required notices and disclosures only in paper format. How you must inform us of your decision to receive future notices and disclosure in paper format and withdraw your consent to receive notices and disclosures electronically is described below.

### **Consequences of changing your mind**

If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. Further, you will no longer be able to use the DocuSign system to receive required notices and consents electronically from us or to sign electronically documents from us.

### **All notices and disclosures will be sent to you electronically**

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through the DocuSign system all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures electronically from us.

### **How to contact Arizona Criminal Justice Commission:**

You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:

To contact us by email send messages to: [alefevre@azcjc.gov](mailto:alefevre@azcjc.gov)

### **To advise Arizona Criminal Justice Commission of your new email address**

To let us know of a change in your email address where we should send notices and disclosures electronically to you, you must send an email message to us at [alefevre@azcjc.gov](mailto:alefevre@azcjc.gov) and in the body of such request you must state: your previous email address, your new email address. We do not require any other information from you to change your email address.

If you created a DocuSign account, you may update it with your new email address through your account preferences.

### **To request paper copies from Arizona Criminal Justice Commission**

To request delivery from us of paper copies of the notices and disclosures previously provided by us to you electronically, you must send us an email to [alefevre@azcjc.gov](mailto:alefevre@azcjc.gov) and in the body of such request you must state your email address, full name, mailing address, and telephone number. We will bill you for any fees at that time, if any.

### **To withdraw your consent with Arizona Criminal Justice Commission**

To inform us that you no longer wish to receive future notices and disclosures in electronic format you may:

- i. decline to sign a document from within your signing session, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;
- ii. send us an email to [alefevre@azcjc.gov](mailto:alefevre@azcjc.gov) and in the body of such request you must state your email, full name, mailing address, and telephone number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

### **Required hardware and software**

The minimum system requirements for using the DocuSign system may change over time. The current system requirements are found here: <https://support.docusign.com/guides/signer-guide-signing-system-requirements>.

### **Acknowledging your access and consent to receive and sign documents electronically**

To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please confirm that you have read this ERSD, and (i) that you are able to print on paper or electronically save this ERSD for your future reference and access; or (ii) that you are able to email this ERSD to an email address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format as described herein, then select the check-box next to ‘I agree to use electronic records and signatures’ before clicking ‘CONTINUE’ within the DocuSign system.

By selecting the check-box next to ‘I agree to use electronic records and signatures’, you confirm that:

- You can access and read this Electronic Record and Signature Disclosure; and
- You can print on paper this Electronic Record and Signature Disclosure, or save or send this Electronic Record and Disclosure to a location where you can print it, for future reference and access; and
- Until or unless you notify Arizona Criminal Justice Commission as described above, you consent to receive exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you by Arizona Criminal Justice Commission during the course of your relationship with Arizona Criminal Justice Commission.

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Stacey Brechler-Knaggs, Grants, Contracts & Emergency Management Director  
**Co-Submitter:** Brian Gall, Airport Director  
**Co-Submitter:** Adam Miele  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



---

**TITLE:**

**Consideration and Approval of Contract:** Construction Manager at Risk (CMAR) Design Phase Services Contract with Loven-Fann Joint Venture in an amount not to exceed \$700,000 for the Airport Snow Removal Equipment Building Project.

**STAFF RECOMMENDED ACTION:**

1. Award the CMAR Design Phase Services contract with Loven-Fann Joint Venture in an amount not to exceed \$700,000, subject to approval by the Federal Aviation Administration (FAA) and Arizona Department of Transportation (ADOT) Multi-Modal Transportation Division; and
2. Authorize Change Order Authority of \$70,000 (10%) to cover potential costs associated with unanticipated or additional items of work. This change order amount is included in the total not to exceed amount of \$700,000; and
3. Authorize the City Manager to execute the necessary documents.

**Executive Summary:**

This Project consists of pre-construction design services, including generating one or more Guaranteed Maximum Price(s) (GMP), for the Snow Removal Equipment Building (SREB) project located at the Flagstaff Pulliam Airport that is currently under design.

This Design Phase Services Contract is for the CMAR to assist in the development of the final Project design. The Project will ultimately include the construction of the SREB, which will be presented as a separate item later this year. The SREB will be approximately 25,000 SF and consists of vehicle storage bays and a maintenance bay, equipment and material storage, and associated support areas. The SREB will be capable of supporting the Flagstaff Airport's Snow and Ice Control Plan for multiple 24-hour operational periods. The development site is 6200 S. Pulliam Dr. (APN 116-61-004) of the Airport in the PF (Public Facility) Zone. The SREB will direct access for snow clearing crews to respond to snow and ice conditions at the Airport. The entire Project site area is approximately 4.5 acres within the larger parcel, which is 31.1 acres. The scope of work includes construction of a new SREB and associated site improvements. The Project also includes realignment of the existing road to the Airport Traffic Control Tower (S. Liberator Lane) (ATCT), a new stormwater basin, space for equipment turning movements, an equipment yard, and parking for employees.

**\*\*\* The final Contract will be attached for review prior to the scheduled City Council meeting.**

**Financial Impact:**

Project Name: Airport Snow Removal Equipment Building  
Total Project Estimated Cost: \$24,780,722  
Account Number Budgeted: 221-07-222-3583-0 and 221-07-222-6271-0

FY2024-25 Budgeted Amount: \$18,312,221

Grant Funded: Yes

Funding Source: U.S. Department of Transportation, Federal Aviation Administration and Arizona Department of Transportation

The total Project budget is estimated to be approximately \$24,780,722 (including additive alternate(s) provided by the funding from City of Flagstaff, FAA, and ADOT. Funding for the project will come from multiple grant awards from the Federal Aviation Administration (FAA), matching funds from Arizona Department of Transportation (ADOT) and City funding.

The City has received one of the FAA grants (Airport Improvement Program (AIP) 51) and the ADOT matching grant for a total of \$4,861,391. We are anticipating two additional FAA and ADOT grants for the Project. The City has requested a letter of commitment to the Project from the FAA, however the full federal funding/grant award for the total project cost will not be considered for award until the GMP(s) is available and award is anticipated around June 2025.

The grant monies are anticipated to be dispersed from April 2023 through June 2025. The total Project budget covers all costs to deliver the Project including but not limited to; itemized proposed equipment to aid in the operation of the facility, landscaping, startup and training. If federal discretionary funds are not authorized, the City would use our federal entitlement funds to cover this work initiative. Based on the GMP, the FAA grant will provide 91.06% of total project funding, ADOT grant will provide 4.47% of funding, with the City grant match of 4.47% at the time of grant award.

**Policy Impact:**

None.

**Previous Council Decision or Community Discussion:**

- On August 18, 2020, Council approved a design services grant contract for APMI for the Project.
- On October 17, 2023, Council approved the FAA AIP 51 grant agreement.

**Options and Alternatives to Recommended Action:**

1. Approve the CMAR Design Phase Services Contract with Loven-Fann Joint Venture, as presented. This will allow timely execution of the Project; or
2. Reject approval of the contract and direct staff to pursue traditional design-bid-build project delivery. This would effectively delay progress on the project by one year and jeopardize the grant funding.

**Background and History:**

On August 18, 2020, the City Council approved a design services grant for APMI for the design of the Snow Removal Equipment Building Project. City staff, the design consultants, and representatives from the FAA and ADOT developed several alternative concepts. Preliminary design is complete and the Project is transitioning to final construction documentation. Pursuant to the Construction Manager at Risk (CMAR) Design Phase Services Contract, Loven-Fann Joint Venture will provide pre-construction design services, including confirmation of the constructability of the APMI plans for the Snow Removal Equipment Building (SREB), development of the schedule for construction, and generation of the GMP.

In recent years, the Arizona State Legislature and Federal Aviation Administration have both authorized the use of Alternative Project Delivery Methods (APDM) in lieu of the traditional Design-Bid-Build method of project delivery. These alternative methods allow a contracting agency the opportunity to select a construction team utilizing a qualifications-based selection process to procure construction services from a firm deemed most qualified to perform the work.

On April 13 and 20, 2024, a Request for Statements of Qualifications (RSOQ) for Construction Manager at Risk (CMAR) services was published in the Arizona Daily Sun and was posted on the Purchasing PlanetBids

web site on April 4, 2024. On April 30, 2024, the City of Flagstaff received five Statements of Qualifications that were responsive to the requirements of the RSOQ for providing CMAR services for this project. A selection committee of five members independently reviewed and evaluated those statements in accordance with the evaluative criteria established in the RSOQ. The evaluation committee consisted of three City staff, one local contractor, and one design professional. Based on numerical evaluation of the statements received, Loven-Fann Joint Venture received the highest ranking and was deemed the most qualified among those submitting proposals to provide CMAR services.

The selection committee final scores were:

Firm	Score	Ranking
Agate	293	4
Core Construction	445	3
Kinney Construction	469	2
Loven- Fann Joint Venture	509	1
Sundt	445	3

Airport snow removal equipment is currently stored in the airport's Aircraft Rescue and Fire Fighting (ARFF) building and other locations across the facility. This Project will allow the Airport to store and respond with the snow removal equipment and additional deicing materials from one centralized location. The site for the new SREB is adjacent to the ARFF building and air traffic control tower and across from Taxiway A at a location previously identified in the Airport Master Plan. The construction of the Project will include:

1. The construction of approx. 25,000-sf SREB with a maximum height of approximately 28 feet.
2. The construction of approx. 1,680-square-foot parking lot.
3. The construction of approx. 30,000-sf low impact development (LID) basin to manage stormwater runoff. (Per FAA requirements, water collected in the stormwater basin will be drained within 48 hours.)

The Project will also involve the paving of a small parking lot on the southwest side of the SREB. The parking lot will consist of nine parking spaces including an electric vehicle stall and an American with Disabilities Act (ADA) compliant space. Trenching will be necessary for utilities to connect to existing infrastructure from the southwestern corner of the proposed SREB, and the Project will relocate portions of existing fencing along the western side of the SREB.

**Connection to PBB Priorities and Objectives:**

Safe & Healthy Community

- Ensure the build environment is safe through the use of consistent standards, rules and regulations, and land use practices.
- Promote physical health through providing recreation opportunities, parks, open space & multiple transportation options.

Sustainable, Innovative Infrastructure

- Deliver outstanding services to residents through a healthy, well maintained infrastructure system.
- Provide effective management of the infrastructure for all modes of transportation.

**Connection to Regional Plan:**

**REGIONAL PLAN GOALS AND POLICIES --**

Goal T.10. Strengthen and expand the role of Flagstaff Pulliam Airport as the dominant hub for passenger, air freight, public safety flights, and other services in northern Arizona.

Policy T.10.1. Maintain and expand Flagstaff Pulliam Airport as an important link to the national air transportation system.

Policy T.10.3. Seek opportunities to expand destinations and frequency of regional air service throughout the southwest and west.

This Project will facilitate improved responsiveness to snowfall at the airport by reducing staff time needed to deploy snow removal equipment and improving access for equipment maintenance. The improved response to snow events will place the airport in a better position to support current airport operations, tenants, and air service, and will be a selling point for additional air service.

**Connection to Carbon Neutrality Plan:**

CLIMATE CHANGE AND ADAPTATION GOALS AND POLICIES -- This facility will be an all-electric, high performance green building (standards of the GSA) and be designed to meet the City of Flagstaff carbon neutrality goals.

**Connection to 10-Year Housing Plan:**

N/A

**Connection to Division Specific Plan:**

N/A

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**Attachments:**    CMAR Design Phase Snow Building  
                          Exhibit B - Loven- Fann COF SREB Design Assist Proposal  
                          Exhibit E - Grant Provisions-FAA Building



# City of Flagstaff, Arizona

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## FLAGSTAFF PULLIAM AIRPORT SNOW REMOVAL EQUIPMENT BUILDING PROJECT CONSTRUCTION MANAGER AT RISK

### DESIGN PHASE SERVICES

Agreement No. 2024-114

**Mayor**

*Becky Daggett*

**Council**

*Austin Aslan  
Deborah Harris  
Khara House*

*Lori Matthews  
Jim McCarthy  
Miranda Sweet*

**City Manager**

*Greg Clifton*

**Water Services Director**

*Shannon Jones*

**Community  
Development Director**

*Dan Folke*

**Public Works Director**

*Scott Overton*

**Engineering & Capital Improvements Director**

*Paul Mood*

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# City of Flagstaff, Arizona

## FLAGSTAFF PULLIAM AIRPORT SNOW REMOVAL EQUIPMENT BUILDING PROJECT CONSTRUCTION MANAGER AT RISK

### DESIGN PHASE SERVICES Agreement No. 2024-114

This Design Phase Services Agreement (“Agreement”), made and entered by and between City of Flagstaff, a political subdivision of the State of Arizona (“Owner”) and Loven-Fann Joint Venture, an Arizona joint-venture (“Construction Manager at Risk” or “CMAR”) is entered into on this \_\_\_ day of \_\_\_\_\_, 20\_\_.

#### RECITALS

- A. The City Manager of the City of Flagstaff, Arizona, is authorized and empowered by provisions of the City Charter to execute agreements for professional services and construction services.
- B. The Owner intends to construct the **Flagstaff Pulliam Airport – Snow Removal Equipment Building Project**, as more fully described in Exhibit “A,” attached (“Project”).
- C. This Project is financed with grant funds primarily from by U.S. Department of Transportation, Federal Aviation Administration, Airport Improvement Program.
- D. To undertake the construction administration of the Project, the Owner has entered into separate agreements with APMI Architecture. (“Design Professional(s)”).
- E. CMAR has represented to the Owner the ability to provide design phase services the Project, and based on this representation, the Owner hereby engages CMAR to provide these services and design the Project.
- F. At the end of the design phase, at the Owner’s discretion, the Owner may enter into a separate Construction Phase Services Agreement with CMAR for construction phase services.

#### AGREEMENT

**NOW THEREFORE**, for and in consideration of the mutual covenants and considerations hereinafter contained, it is agreed by and between the Owner and CMAR as follows:

#### ARTICLE 1 - TERMS AND DEFINITIONS

“Addenda” - Written or graphic instruments issued prior to the submittal of the GMP Proposal(s), which clarify, correct or change the GMP Proposal(s) requirements.

“Agreement (Contract)” - This written document signed by the Owner and CMAR covering the design phase of the Project, and including other documents itemized and referenced in or attached to and made part of this Agreement.

“Alternate Systems Evaluations” - Alternatives for design, means and methods or other scope considerations that are evaluated using value engineering principles which have the potential to reduce construction costs while still delivering a quality and functional Project that meets the Owner requirements.

“Change Directive” - A written order prepared and signed by the Owner, directing a change in the Work prior to agreement on an adjustment in the Contract Price and the Contract Time.

“Change Order” - A type of contract amendment issued after execution of the Contract Documents where unanticipated or unforeseen circumstances in the Work have been encountered. Each Change Order shall be signed by the Owner and CMAR, stating their agreement upon all of the following: the addition, deletion or revision in the scope of services or Deliverables; the amount of the adjustment to the Contract Price; the amount of the adjustment to the Contract Time; or other modifications of other Agreement terms.

“City (Owner)” - The City of Flagstaff, a political subdivision of the State of Arizona, with whom CMAR has entered into this Agreement and for whom the services are to be provided pursuant to said Agreement.

“CMAR” - Loven Contracting, Inc. and Fann Contracting, Inc., as participants in the Loven-Fann Joint Venture, who have been selected by the Owner to provide design phase services as detailed in this Agreement.

“CMAR Representative” - The designated CMAR Representative.

“CMAR Senior Representative” - The designated CMAR Senior Representative.

“Construction Documents” - Certain plans, specifications and drawings prepared by the Design Professionals after correcting for permit review requirements or dated plans and specifications specifically identified as the “Construction Documents” herein or in an Exhibit or Addendum which is attached hereto.

“Construction Fee” - CMAR’s administrative costs for providing off-site management, supervision, General Conditions support, support of construction activities, home office overhead, and profit, as applicable to this Project, whether at CMAR’s principal or branch offices.

“Contingency, CMAR’s” - A fund to cover cost growth during the Project, legitimate unforeseen construction expenses, or expenses otherwise agreed to by the Owner to be used at the discretion of CMAR usually for costs that result from Project circumstances. The amount of CMAR’s Contingency shall be negotiated as a separate line item in each GMP package. Use and management of CMAR’s Contingency is described in this Agreement.

“Contingency, Owner’s” - A fund to cover cost growth during the Project used at the discretion of the Owner usually for costs that result from the Owner-directed changes or unforeseen Site conditions. The amount of the Owners’ Contingency shall be set solely by the Owner and shall be in addition to the CMAR’s GMP.

“Contract Documents” - The following items and documents in descending order of precedence executed by the Owner and CMAR: (i) all written modifications, amendments and Change Orders; (ii) this Agreement, including all exhibits and attachments; (iii) Construction Documents; and (iv) GMP Plans and Specifications.

“Contract Price” - The cost for services for this Agreement.

“Contract Time(s)” - The number of days or the dates related to the construction phase, including authorized adjustments, allotted in the Construction Documents for Substantial and final Completion of the Work, subject to Winter Shutdown.

“Cost Models” - Cost tabulation for the construction of the Project developed by the CMAR and continually updated throughout the preconstruction phase fee and utilized to develop the Guaranteed Maximum Price Proposal. The Cost Model is created using the Design Professionals list of standard pay items.

“Cost of the Work” - The direct costs necessarily incurred by CMAR in the proper performance of the Work. The Cost of the Work shall include direct labor costs, subcontract costs, costs of materials and equipment incorporated in the completed construction, costs of other materials and equipment, temporary facilities, permit and license fees, materials testing, and related items. The Cost of the Work shall not include CMAR’s Construction Fee, General Conditions Cost, bonds, insurance, or taxes.

“Critical Path Method” or “CMP” - A scheduling technique used to predict project duration by analyzing which sequence of activities has the least amount of scheduling flexibility thus identifying the path (sequence) of activities which represent the longest time required to complete the Project. Delay in completion of the identified activities shall cause a delay in achieving Substantial Completion.

“Day(s)” - Calendar days unless otherwise specifically noted in the Contract Documents.

“Deliverables, Construction Phase Services Agreement” - The Work conducted by CMAR during the construction phase which may include, but is not limited to: Construction Management Plan, Project Schedule, Schedule of Values, alternative system evaluations, procurement strategies and plans, cost models, construction market surveys, cash flow projections, GMP Proposals, Subcontractor procurement plan, Statement of Proposed Minority Business Enterprise/Women’s Business Enterprise (“MBE/WBE”) Utilization as may be required or appropriate, Subcontractor agreements, Subcontractor bid packages, Supplier agreements, and others as indicated in this Agreement or required by the Project Team and other services set forth in this Agreement or reasonably inferable therefrom.

“Deliverables, Design Phase Services Agreement” - The Work conducted by CMAR during the design phase which may include, but is not limited to: design recommendations, Project scheduling, constructability reviews, alternate systems evaluation, cost estimate, Minority Business Enterprise/Woman’s Business Enterprise/Small Business Enterprise (“MBE/WBE/SBE”) utilization, Subcontractor agreements, Subcontractor bid packages, GMP preparations and other services set forth in this Agreement or reasonably inferable therefrom.

“Design Professional(s)” - A qualified, licensed design professional who furnishes design, construction documents, and/or construction administration services required for the Project.

“Drawings (Plans)” - Documents, which visually represent the scope, extent and character of the Work to be furnished and performed by CMAR during the construction phase, and which have been prepared or approved by the Design Professional(s) and the Owner. Includes Drawings that have reached a sufficient stage of completion and released by the Design Professional(s) solely for the purposes of review and/or use in performing constructability or biddability reviews and in preparing cost models (e.g., conceptual design Drawings, preliminary design Drawings, detailed design Drawings at 30%, 60%, 90% or 100% or schematic, design development, construction documents), but *“not for construction”*. Shop Drawings are not Drawings as so defined.

“Differing Site Conditions” - Concealed or latent physical conditions or subsurface conditions at the Site that: (i) materially differ from the conditions indicated in the Contract Documents; or (ii) are of an unusual nature, differing materially from the conditions ordinarily encountered and generally recognized as inherent in the Work.

“Final Completion” - 100% completion of all construction Work noted in, or reasonably inferred from, the Contract Documents, including but not limited to, all Punch Lists work, all record and close-out documents specified in Owner’s Project specifications and Owner training/start up activities.

“Float” - The number of Days by which an activity can be delayed without lengthening the CMP and extending the Substantial Completion date.

“General Conditions Costs” - All on-site Project-specific costs required to perform the Work, but not itemized or included in the Cost of the Work. Includes, but is not limited to, the following types of costs for CMAR during the construction phase: (i) payroll costs for Project manager or CMAR for Work conducted at the Site, (ii) payroll costs for the superintendent and full-time general foremen, (iii) payroll costs for other management personnel resident and working at the Site, (iv) workers not included as direct labor costs engaged in support (e.g. loading/unloading, clean-up, etc.), (v) costs of offices and temporary facilities setup solely for this Project including office materials, office supplies, office equipment and minor expenses, (vi) cost of utilities, fuel, sanitary facilities and telephone services at the Site; (vii) costs of liability and other applicable insurance premiums not include in labor burdens for direct labor costs; (viii) costs of bonds premiums; (ix) costs of consultants not in the direct employ of CMAR or Subcontractors.

“Guaranteed Maximum Price” (“GMP”) - The sum of the maximum Cost of the Work; the Construction Fee, General Conditions Costs, taxes, and CMAR’s Contingency.

“GMP Plans and Specifications” - Plans and specifications upon which the Guaranteed Maximum Price Proposal is based.

“Grant Provisions” - This Project is financed with grant funds primarily from by U.S. Department of Transportation, Federal Aviation Administration, Airport Improvement Program.

“Guaranteed Maximum Price (GMP) Proposal” - The offer or proposal of CMAR submitted on the prescribed form setting forth the GMP prices for the entire Work or portions of the Work to be performed during the construction phase. The GMP Proposal(s) are to be developed pursuant to Article 2 of this Agreement.

“Legal Requirements” - All applicable federal, state and local laws, codes, ordinances, rules, regulations, orders and decrees of any government or quasi-government entity having jurisdiction over the Project or Site, the practices involved in the Project or Site, or any Work.

“Notice to Proceed” or “NTP” - The directive issued by the Owner, authorizing CMAR to start Work.

“Opening Physical Conditions” - The current physical conditions present on the Site as jointly documented by an inspection of the Site by Owner and CMAR at the Pre-construction Conference.

“Owner’s Representative” - The designated City Project Manager.

“Owner’s Senior Representative” - The City of Flagstaff’s designated Division/Department Head.

“Performance Period” - The period of time allotted in the Contract Documents to complete the Work comprised within a GMP. The Performance Period shall be stated with each GMP and shown on the Project Master Schedule.

“Payment Request” - The form used by CMAR in requesting progress payments or final payment and which shall include such supporting documentation as is required by the Contract Documents and or the Owner.

“Pre-construction Conference” - A Conference held between Owner and CMAR prior to the commencement of any Work, as scheduled by the Owner’s Representative or designee.

“Product Data” - Illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by CMAR to illustrate materials or equipment for some portion of the Work.

“Project” - The Work to be completed in the execution of this Agreement, as amended, and as described in the Recitals above and in Exhibit “A” attached.

“Project Team” - The design phase services team consisting of the Design Professional(s), CMAR, the Owner’s Representative, the Owner’s Client Department representatives and other stakeholders who are responsible for making decisions regarding the Project.

“Schedule of Values (SOV)” - A statement furnished by CMAR to the Owner’s Representative for approval, reflecting the portions of the GMP allotted for the various parts of the Work and used as the basis for evaluating CMAR’s applications for progress payments.

“Shop Drawings” - All drawings, diagrams, schedules and other data specifically prepared for the Work by CMAR or a Subcontractor, Sub-Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

“Site” - Land or premises on which the Project is located.

“Specifications” - The part(s) of the Contract Documents for the construction phase consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship, as applied to the Work, and certain administrative details applicable thereto.

“Subconsultant” - A person, firm or corporation having an agreement with CMAR to furnish services required as its independent professional associate or consultant with respect to the Project.

“Subcontractor” - An individual or firm having a direct agreement with CMAR or any other individual or firm having an agreement with the aforesaid contractors at any tier, who undertakes to perform a part of the design phase services or construction phase Work at the Site for which CMAR is responsible.

“Submittals” - Documents and/or things that may be produced or presented by one party for consideration, review, or such other actions as may be required by this Agreement by another party, entity or person. Examples of Submittals include, but are not limited to, preliminary or evolving drafts, product data samples, etc.

“Substantial Completion” - The construction services for the Work (or a specified part thereof) has progressed to the point where, in the opinion of the Owner’s Representative, as evidenced by a Certificate of Substantial Completion, such construction services are sufficiently complete in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; without any outstanding concurrent Work at the site, except as may be required to complete or correct Punch List items. If no such certificate is issued, Substantial Completion takes place when the construction services Work or a Construction Phase is complete and ready for final payment as evidenced by the written recommendation of final payment by the Owner’s Representative. The terms “substantially complete” and “substantially completed” as applied to all or part of the construction Work refers to Substantial Completion thereof.

“Supplier” - A manufacturer, fabricator, supplier, distributor, materialman or vendor having a direct agreement with CMAR or with any Subcontractor to furnish materials or equipment to be incorporated in the construction phase Work by CMAR or any Subcontractor.

“Winter Shutdown” - The period of time typically including December through March during which no Work will be performed by any person or entity (including, but not limited to, the CMAR) on the Project and CMAR shall shutdown, properly insulate and shelter the Project in a safe and workmanlike manner pursuant to local, state and federal laws. Although December through March is typically the time frame, the Owner reserves the right to initiate and terminate a Winter Shutdown at the Owner’s sole discretion in the event of adverse weather conditions. A Winter Shutdown may be declared by the Owner despite delays, *for any reason*, on the Project.

“Work” - The entire completed construction or the various separately identifiable parts thereof, required to be furnished during the construction phase. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials, resources and equipment into the construction, and performing or furnishing services and documents as required by the Contract Documents for the construction phase.

## **ARTICLE 2 – BASIC DESIGN PHASE SERVICES**

### **2.1 GENERAL**

2.1.1 CMAR, to further the interests of the Owner, shall perform the services required by, and in accordance with this Agreement, to the satisfaction of the Owner, exercising the degree of care, skill and judgment a professional construction manager performing similar services in Flagstaff, Arizona would exercise at such time, under similar conditions. CMAR shall, at all times, perform the required services consistent with sound and generally accepted construction management and construction contracting practice.

2.1.2 Program Evaluation. As a participating member of the Project Team, CMAR shall provide to the Owner and Design Professional(s) a written evaluation of the Owner’s Project Program and Project Budget, each in terms of the other, with recommendations as to the appropriateness of each.

- 2.1.3 Project Meetings. CMAR shall attend Project Team meetings which may include, but are not limited to, monthly Project management meetings, Project workshops, special Project meetings, construction document rolling reviews and partnering sessions.
- 2.1.4 CMAR shall provide design phase services, described herein, in a proactive manner and consistent with the intent of the most current Drawings and Specifications. CMAR shall promptly notify the Owner in writing whenever CMAR determines that any Drawings or Specifications are inappropriate for the Project and/or cause changes in the scope of Work requiring an adjustment in the cost models, Project Schedule, GMP Proposals and/or in the Contract Time for the Work, to the extent such are established.
- 2.1.5 CMAR, when requested by the Owner, shall attend, make presentations and participate as may be appropriate in public agency and or community meetings, germane to the Project. CMAR shall provide drawings, schedule diagrams, budget charts and other materials describing the Project, when their use is required or apropos in any such public agency meetings.

## **2.2 CONSTRUCTION MANAGEMENT PLAN**

- 2.2.1 CMAR may, and at the written request of the Owner, shall prepare a Construction Management Plan ("CMP"), which, at the written request of the Owner, shall include CMAR's professional opinions concerning: (a) Project milestone dates and the Project Schedule, including the broad sequencing of the design and construction of the Project, (b) investigations, if any, to be undertaken to ascertain subsurface conditions and physical conditions of existing surface and subsurface facilities and underground utilities, (c) alternate strategies for fast-tracking and/or phasing the construction, (d) the number of separate subagreements to be awarded to Subcontractors and Suppliers for the Project construction, (e) permitting strategy, (f) safety and training programs, (g) construction quality control, (h) a commissioning program, (i) the cost models and basis of the GMP Proposal, and (j) a matrix summarizing each Project Team member's responsibilities and roles.
- 2.2.2 CMAR may, and at the written request of the Owner, shall add detail to its previous version of the CMP to keep it current throughout the design phase, so that the CMP is ready for implementation at the start of the construction phase. The update/revisions may, and at the written request of the Owner shall, take into account (a) revisions in Drawings and Specifications; (b) the results of any additional investigatory reports of subsurface conditions, drawings of physical conditions of existing surface and subsurface facilities and documents depicting underground utilities placement and physical condition, whether obtained by the Owner, Design Professional(s) or CMAR, (c) unresolved permitting issues, and significant issues, if any, pertaining to the acquisition of land and right of way, (d) the fast-tracking if any of the construction, or other chosen construction delivery methods, (e) the requisite number of separate bidding documents to be advertised, (f) the status of the procurement of long-lead time equipment (if any) and/or materials, and (g) funding issues identified by the Owner.

## **2.3 PROJECT MASTER SCHEDULE**

- 2.3.1 The fundamental purpose of the "Project Master Schedule" is to identify, coordinate and record the tasks and activities to be performed by all of the Project Team members and then for the Project Team to utilize that Deliverable as a basis for managing and monitoring all member's compliance with the schedule requirements of the Project. Each Project Team member is responsible for its compliance with the Project Master Schedule requirements. CMAR shall develop and maintain the "Project Master Schedule" on behalf of and to be used by the Project Team based on input from the other Project Team members. The Project Master Schedule shall be consistent with the most recent revised/updated CMP. The Project Master Schedule shall use the Critical Path Method (CPM) technique, unless required otherwise, in writing by the Owner. CMAR shall use scheduling software to develop the Project Master Schedule that is acceptable to the Owner. The Project Master Schedule shall be presented in graphical and tabular reports as agreed upon by the Project Team. If Project phasing as described below is required, the Project Master Schedule shall indicate milestone dates for the phases once determined.
- 2.3.2. The Project Master Schedule shall include a CPM diagram schedule that shall show the sequence of activities, the interdependence of each activity and indicate the CPM.

- 2.3.2.1 The CPM diagram schedule shall be in Days and indicate duration, earliest and latest start and finish dates for all activities, and total Float times for all activities except critical activities. The CPM diagram schedule shall be presented in a time scaled graphical format for the Project as a whole.
- 2.3.2.2 The CPM diagram schedule shall indicate all relationships between activities.
- 2.3.2.3 The activities making up the CPM diagram schedule shall be in sufficient detail to assure that adequate planning has been done for proper execution of the Work and such that it provides an appropriate basis for monitoring and evaluating the progress of the Work. Formulation of the Project Master Schedule must also be based on the Opening Physical Conditions of the Site and any potential Winter Shutdown in the event the Work on the Project is delayed for any reason.
- 2.3.2.4 The CPM diagram schedule shall be based upon activities, which would coincide with the schedule of values.
- 2.3.2.5 The CPM diagram schedule shall show all Submittals associated with each work activity and the review time for each submittal.
- 2.3.2.6 The CPM diagram schedule shall show milestones, including milestones for Owner-furnished information, and shall include activities for Owner-furnished equipment and furniture when those activities are interrelated with CMAR activities.
- 2.3.2.7 The schedule shall include a CPM activity that reflects anticipated weather delay during the performance of this Agreement. The duration shall reflect the average climatic range and usual industrial conditions prevailing in the locality of the Site. Weather data shall be based on the information set forth on the City of Flagstaff's Table of "Monthly Anticipated Adverse Weather Calendar Days" Exhibit "D" attached, and the explanatory paragraphs attached thereto.
- 2.3.3 The Project Schedule shall consider the Owner's and the tenants' occupancy requirements showing portions of the Project having occupancy priority, and Contract Time.
- 2.3.4 Float time shall be as prescribed below:
  - 2.3.4.1 The total Float within the overall schedule, is not for the exclusive use of either the Owner or CMAR, but is jointly owned by both and is a resource available to and shared by both parties as needed to meet Agreement milestones and the Project completion date.
  - 2.3.4.2 CMAR shall not sequester shared Float through such strategies as extending activity duration estimates to consume available Float, using preferential logic, or using extensive crew/resource sequencing, etc. Since Float time within the schedule is jointly owned, no time extensions shall be granted nor delay damages paid until or unless a delay occurs which extends the Work beyond the Substantial Completion date.
  - 2.3.4.3 Since Float time within the schedule is jointly owned, it is acknowledged that the Owner-caused delays on the Project may be offset by Owner-caused time savings (e.g., CPM Submittals returned in less time than allowed by the Agreement, approval of substitution requests and credit changes which result in savings of time to CMAR, etc.). In such an event, CMAR shall not be entitled to receive a time extension or delay damages until all Owner-caused time savings are exceeded, and the Substantial Completion date is also exceeded.
- 2.3.5 The Project Schedule shall be updated and maintained by CMAR throughout the design phase such that it shall not require major changes at the start of the construction phase to incorporate CMAR's plan for the performance of the construction phase Work. CMAR shall provide updates and/or revisions to the Project Schedule for use by the Project Team, whenever required, but no less often than at the monthly Project Team meetings. CMAR shall include with such Submittals a narrative describing its analysis of the progress achieved to-date vs. that planned, any concerns regarding delays or potential delays, and any recommendations regarding mitigating actions.

2.3.6 If phased construction is deemed appropriate and the Owner and Design Professional(s) approve, CMAR shall review the design and make recommendations regarding the phased issuance of Construction Documents to facilitate phased construction of the Work, with the objective of reducing the Project Schedule and/or Cost of the Work. CMAR shall take into consideration such factors as natural and practical lines of Work severability, sequencing effectiveness, access and availability constraints, total time for completion, construction market conditions, labor and materials availability, and any other factors pertinent to saving time and cost.

## **2.4 DESIGN DOCUMENT REVIEWS**

2.4.1 CMAR shall evaluate periodically the availability of labor, materials/equipment, building systems, cost-sensitive aspects of the design; and other factors that may impact the cost models, GMP Proposals and/or the Project Master Schedule.

2.4.2 CMAR shall recommend, in conjunction with the Project Team, those additional surface and subsurface investigations that, in its professional opinion, are required to provide the necessary information for CMAR to construct the Project. Before initiating construction operations, CMAR may request additional investigations in their GMP Proposal to improve the adequacy and completeness of the Site condition information and data made available with the Construction Documents.

2.4.3 CMAR shall meet with the Project Team, as required, to review designs during their development. CMAR shall familiarize itself with the evolving documents through the various design phases. CMAR shall proactively advise the Project Team and make recommendations on factors related to construction costs, and concerns pertaining to the feasibility and practicality of any proposed means and methods, selected materials, equipment and building systems, and, labor and material availability. CMAR shall advise the Project Team on proposed Site improvements, excavation and foundation considerations, as well as, concerns that exist with respect to coordination of the Drawings and Specifications. CMAR shall recommend cost effective alternatives.

2.4.4 CMAR shall conduct constructability and bidability reviews of the Drawings and Specifications as necessary to satisfy the needs of the Project Team and at a minimum as scheduled and identified by milestones in the Project Master Schedule. The reviews shall attempt to identify all discrepancies and inconsistencies in the Construction Documents especially those related to clarity, consistency, and coordination of Work of Subcontractors and Suppliers.

2.4.4.1 Constructability Reviews. CMAR shall evaluate whether (a) the Drawings and Specifications are configured to enable efficient construction, (b) design elements are standardized, (c) construction efficiency is properly considered in the Drawings and Specifications, (d) module/preassembly design are prepared to facilitate fabrication, transport and installation, (e) the design promotes accessibility of personnel, material and equipment and facilitates construction under adverse weather conditions, (f) sequences of Work required by or inferable from the Drawings and Specifications are practicable, and (g) the design has taken into consideration, efficiency issues concerning; access and entrance to the Site, laydown and storage of materials, staging of Site facilities, construction parking, and other similar pertinent issues.

2.4.4.2 Bidability Reviews. CMAR shall check cross-references and complementary Drawings and sections within the Specifications, and in general evaluate whether (a) the Drawings and Specifications are sufficiently clear and detailed to minimize ambiguity and to reduce scope interpretation discrepancies, (b) named materials and equipment are commercially available and are performing well or otherwise, in similar installations, (c) Specifications include alternatives in the event a requirement cannot be met in the field, and (d) in its professional opinion, the Project is likely to be subject to differing Site conditions.

2.4.4.3 Results of the reviews shall be provided to the Owner in formal, written reports clearly identifying all discovered discrepancies and inconsistencies in the Drawings and Specifications with notations and recommendations made on the Drawings, Specifications and other documents. If requested by the Owner, CMAR shall meet with the Owner and Design Professional(s) to discuss any findings and review reports.

- 2.4.4.4 CMAR's reviews shall be from a contractor's perspective, and though it shall serve to reduce the number of Requests for Information (RFI) and changes during the construction phase, responsibility for the Drawings and Specifications shall remain with the Design Professional(s) and not CMAR.
- 2.4.5 Notification of Variance or Deficiency. It is CMAR's responsibility to assist the Design Professional(s) in ascertaining that, in CMAR's professional opinion, the Construction Documents are in accordance with applicable laws, statutes, ordinances, building codes, rules and regulations. If CMAR recognizes that portions of the Construction Documents are at variance with applicable laws, statutes, ordinances, building codes, rules and regulations, it shall promptly notify the Design Professional(s) and Owner in writing, describing the apparent variance or deficiency. However, the Design Professional(s) is ultimately responsible for the compliance with those laws, statutes, ordinances, building codes, rules and regulations.
- 2.4.6 Alternate Systems Evaluations. The Project Team shall routinely identify and evaluate using value engineering principles any alternate systems, approaches, design changes that have the potential to reduce Project costs while still delivering a quality and functional product. If the Project Team agrees, CMAR in cooperation with the Design Professional(s) shall perform a cost/benefit analysis of the alternatives and submit such in writing to the Project Team. The Project Team shall decide which alternatives shall be incorporated into the Project. The Design Professional(s) shall have full responsibility for the incorporation of the alternatives into the Drawings and Specifications. CMAR shall include the cost of the alternatives into the cost models and any GMP Proposals.

## **2.5 COST MODEL**

- 2.5.1 Unless otherwise agreed by both parties, within fourteen (14) days after receipt of the documents for the various phases of design, CMAR shall develop a detailed Cost Model for the entire Project for review by the Owner and the Design Professional(s). The Cost Model shall be prepared in a format agreed upon in advance by the Owner and the CMAR. It will be based on the Design Professional(s)' list of standard pay items.
- 2.5.2 During the review period, the Cost Model will be compared with the estimates prepared by the CMAR and the Owner. The Design Professional(s) and CMAR shall reconcile any disagreements on the estimate to arrive at an agreed cost. If no consensus is reached, the Owner shall make the final determination. Once approved by the Owner, the Cost Model will be continually updated and kept current as the design progresses throughout the Preconstruction Phase until a GMP is agreed upon by both the CMAR and the Owner.
- 2.5.3 The Cost Model shall not include the CMAR's preconstruction services fee, sums due to CMAR, the cost of land, right of way, or other costs which are the responsibility of the Owner. The CMAR shall communicate to the Project Team any assumptions made in preparing the Cost Model.
- 2.5.4 Each Cost Model submitted shall be accompanied by backup documentation which shall include, but not be limited to the following:
- 2.5.4.1 Unit prices and quantity take-offs using the Design Professional(s)' standard pay items;
  - 2.5.4.2 Details of all allowances and unit price work shown and specified in the detailed design documents;
  - 2.5.4.3 Include a list of all assumptions and description and breakdown of all allowances;
  - 2.5.4.4 Material costs, equipment costs, labor costs, General Conditions costs, hourly labor rates, and total cost;
  - 2.5.4.5 Copies of quotations from subcontractors and suppliers;
  - 2.5.4.6 Portion of the work to be performed by subcontractors including subcontractors overhead and profit;

- 2.5.4.7 Production rates, transportation, and other facilities and services necessary for the proper execution of the work, whether temporary or permanent, and whether or not incorporated or to be incorporated into the work;
  - 2.5.4.8 All fixed equipment, site improvements, utility and equipment installations;
  - 2.5.4.9 Project overhead;
  - 2.5.4.10 Allocated general and administrative expenses;
  - 2.5.4.11 Bonds, taxes, insurance;
  - 2.5.4.12 The CMAR's profit; and
  - 2.5.4.13 Memoranda, narratives, reports, and all other information included by the CMAR to arrive at the price shown in the Cost Model or GMP.
- 2.5.5 If any Cost Model submitted to the Owner exceeds previously accepted Cost Models or the Owner's Project budget, CMAR shall make appropriate recommendations on methods and materials to the Owner and Design Professional(s) that CMAR believes shall bring the Project back into the Project budget.
- 2.5.6 In between these milestone estimates, CMAR shall periodically provide a tracking report, which identifies the upward or downward movements of costs due to value engineering or scope changes. It shall be the responsibility of CMAR to keep the Owner and Design Professional(s) informed as to the major trend changes in costs relative to the Owner's budget.
- 2.5.7 If requested by the Owner, CMAR shall prepare a preliminary "cash flow" projection based upon historical records of similar type projects to assist the Owner in the financing process.

**2.6 SECTION LEFT INTENTIONALLY BLANK**

**2.7 GUARANTEED MAXIMUM PRICE (GMP) PROPOSALS**

- 2.7.1 The proposed GMP for the entire Work (or portions thereof) shall be presented in a format acceptable to the Owner and utilizing the formulas as shown in Exhibit "C" attached. The Owner may request a GMP Proposal for all or any portion of the Project and at any time during the design phase. Any GMP Proposals submitted by CMAR shall be based on and consistent with the current update/revised cost model at the time of the request and shall include any clarifications or assumptions upon which the GMP Proposal(s) are based. CMAR guarantees to complete the Project at or less than the final approved GMP Proposal amount, plus approved Change Orders, and agrees that it shall be responsible for any increase in the actual cost of the Work above that amount.
- 2.7.2 The Contract Price is the sum of the GMP and the Owner's Contingency. The Contract Price is comprised of the following actual costs and is a not-to-exceed, reimbursable amount.
- 2.7.2.1 The General Conditions will be included in the GMP as a not-to-exceed, reimbursable amount paid for on actual costs based on submitted and approved invoices.
  - 2.7.2.2 The Construction Fee is a firm fixed lump sum and shall be paid monthly in accordance with the percentage of completion of the work.
  - 2.7.2.3 Bonds are actual costs and are a not-to-exceed reimbursable amount.
  - 2.7.2.4 Insurance is actual costs and is a not-to-exceed reimbursable amount.

- 2.7.2.5 Taxes are deemed to include all sales, use, consumer and other taxes, which are legally enacted when negotiations of the GMP were concluded, whether or not yet effective, or merely scheduled to go into effect. Taxes are actual costs and are a not-to-exceed reimbursable amount.
- 2.7.2.6 CMAR's Contingency is an amount CMAR may use at its sole discretion for increases in the Cost of the Work, legitimate unforeseen construction expenses, or expenses otherwise agreed to by the Owner, and for increases in General Condition Costs with written approval of the Owner. CMAR's Contingency shall be included in the GMP amount provided by the CMAR, but all appropriate markups shall not be applied to the CMAR's Contingency at the time of GMP submission. At the time that the CMAR's Contingency is used the appropriate markups shall be applied, which shall only include Construction Fees, Bonds, Insurance, and Sales Tax. CMAR shall submit a Field Order Proposal, with supporting itemized schedule and pricing documentation, for Owner review and confirmation of appropriate CMAR's Contingency use for the project and for verification that appropriate markups are applied. The Owner has the authority to reject any use of the CMAR's Contingency if the Owner believes in its reasonable judgement that a portion or all the proposed amount is not a legitimate expense for the Project.
- 2.7.2.7 Owner's Contingency are funds to be used at the sole discretion of the Owner to cover any increases in Project costs that result from Owner directed changes or unforeseen Site conditions. Owner's Contingency shall be added to the GMP amount provided by the CMAR, the sum of which shall be the Contract Price for construction. At the time that Owner's Contingency is used, the appropriate markups shall be applied and shall only include Construction Fees, Bonds Insurance, and Sales Tax.
- 2.7.3 GMP amendments are cumulative except for CMAR's Contingency. The amount of CMAR's Contingency for each GMP shall be negotiated separately.
- 2.7.4 CMAR, in preparing any GMP Proposal, shall obtain from the Design Professional(s), three (3) sets of signed, sealed, and dated plans and specifications (including all addenda). CMAR shall prepare its GMP in accordance with the Owner's request for GMP Proposal requirements based on the most current completed plans and specifications at that time. CMAR shall mark the face of each document of each set upon which its proposed GMP is based. These documents shall be identified as the GMP Plans and Specifications. CMAR shall send one set of those documents to the Owner's Representative, keep one set and return the third set to the Design Professional(s).
- 2.7.5 An updated/revised Project Master Schedule shall be included with any GMP Proposal(s) that reflects the GMP Plans and Specifications. Any such Project Master Schedule updates/revisions shall continue to comply with the requirements of Section 2.3 above.
- 2.7.6 The Project Master Schedule required above shall include a preliminary Construction Schedule developed in a CPM with the first requested GMP. If subsequent GMP's are requested, CMAR shall include an updated CPM Construction Schedule with their GMP submittal.
- 2.7.7 GMP savings resulting from a lower actual Project cost than anticipated by CMAR remaining at the end of the project, shall revert to the Owner.
- 2.7.8 GMP Proposal(s) Review and Approval Process
- 2.7.8.1 The Owner may request a GMP from CMAR at any time during the performance of the design phase services. It is the Owner's expectation that the GMP shall not exceed the Owner-stated Project budget.
- 2.7.8.2 CMAR shall meet with the Owner and Design Professional(s) to review the GMP Proposal(s) and the written statement of its basis. In the event the Owner or Design Professional(s) discovers inconsistencies, inaccuracies or confusion in the information presented, CMAR shall make adjustments as necessary to the GMP Proposal, its basis or both.
- 2.7.8.3 CMAR's detailed cost model and GMP shall be reviewed by the Design Professional(s) and the Owner for reasonableness and compatibility with the Owner's Project and the Owner's budget. CMAR shall provide a response to the Design Professional(s) and Owner's questions and an explanation of

differences between the Owner's Project budget and CMAR's cost model and corresponding GMP. Owner may require that such responses and explanations be submitted in writing. CMAR, Owner and Design Professional(s) shall engage in a mutually agreeable process in an effort to achieve a clearly understood mutually acceptable GMP.

- 2.7.8.4 If the GMP exceeds the Owner's Project budget, the Owner reserves the right to direct CMAR (and CMAR shall) work in conjunction with the Design Professional(s) to assist in the redesign of the Project as necessary to meet the agreed upon program and the stated Project budget as follows:
  - 2.7.8.4.1 After direction from the Owner, CMAR shall coordinate and cooperate with the Project Team to assist the Design Professional(s) in altering and re-drafting Construction Documents as necessary to accomplish the required reduction in cost.
  - 2.7.8.4.2 CMAR shall develop and provide to the Owner a GMP in connection with the altered Construction Documents to accomplish the necessary reductions in cost.
  - 2.7.8.4.3 CMAR shall analyze the Design Professional(s)' original submittal and as altered and redrafted Construction Documents and make recommendations to the Owner as to ways and methods to reduce the costs of constructing the Project to a sum which does not exceed the stated Project budget.
  - 2.7.8.4.4 CMAR shall perform the work set forth in this Agreement without additional compensation.
  - 2.7.8.4.5 The Owner, upon receipt of any GMP proposal from CMAR, may submit the GMP Plans and Specifications to a third-party for review and verification.
- 2.7.8.4 If the GMP Proposal is greater than the third-party estimate or if the Owner, for some other stated reason may desire, the Owner may require CMAR to reconfirm its GMP Proposal. CMAR shall accept the third-party's estimate for the cost of Work as part of its GMP Proposal or present a report within seven (7) days of a written request by the Owner for such a report identifying, explaining, and substantiating the differences and/or explaining other concerns the Owner may raise. CMAR may be requested to, or at its own discretion, submit a revised GMP Proposal for consideration by the Owner.
- 2.7.8.5 If during the review and negotiation of GMP Proposals design changes are required, the Owner shall authorize and cause the Design Professional(s) to revise the Construction Documents to the extent necessary to reflect the agreed-upon assumptions and clarifications contained in the final approved GMP Proposal. Such revised Construction Documents shall be furnished to CMAR. CMAR shall promptly notify the Design Professional(s) and Owner in writing if any such revised Construction Documents are inconsistent with the agreed-upon assumptions and clarifications.
- 2.7.8.6 After final submission of the GMP Proposal, the Owner may do any of the following:
  - 2.7.8.7.1 Accept the CMAR original or revised GMP Proposal, if within the Owner's budget, without comment;
  - 2.7.8.7.2 Accept the CMAR original or revised GMP Proposal that exceeds the Owner's budget, and indicate in writing to CMAR that the Project Budget has been increased to fund the differences; or
  - 2.7.8.7.3 Reject the CMAR original or revised GMP Proposal in which event, the Owner may terminate this Agreement and/or elect to not enter into a separate Agreement with CMAR for the construction phase services associated with the scope of Work reflected in the GMP Proposal.
- 2.7.8.7 Upon acceptance by the Owner of a GMP Proposal, the Owner shall prepare, and CMAR shall execute, the Owner's specified form of Agreement to reflect the GMP, and the GMP as approved shall become part of the Construction Services Agreement. Within ten (10) days after execution of the Construction Services Agreement, CMAR shall provide to the Procurement Section a Performance Bond and a Labor and Material Payment Bond, each for 100% of the full Agreement price.

## **2.8 SUBCONTRACTORS AND MAJOR SUPPLIERS SELECTION**

- 2.8.1 There are three (3) ways to select Subcontractors and Major Suppliers prior to submission of any GMP Proposal. They are:
- 2.8.1.1 A combination of qualifications and price derived through competitive bidding.
  - 2.8.1.2 Qualitative selection with the subsequent negotiation of a price that is reasonable, a prudent use of public funds and in the Owner's best interest.
  - 2.8.1.3 Absent special circumstances documented in writing by CMAR as set forth below, the combination of qualifications and price derived through the competitive bidding process shall be used to select Subcontractors and Major Suppliers. The Owner has the sole discretion as to whether to allow the purely qualitative selection of Subcontractors and Major Suppliers. In any event, CMAR shall ensure compliance with A.R.S. § 34-603 et seq.
- 2.8.2 The Owner may approve the selection of Subcontractors and Major Suppliers based only on their qualifications when CMAR can demonstrate, in writing, that it is in the best interest of the Project and that the selection process shall constitute a prudent use of public funds.
- 2.8.2.1 A purely qualification-based selection of Subcontractors and Major Suppliers shall only occur prior to the submittal of any applicable GMP Proposal.
  - 2.8.2.2 CMAR shall prepare a Subcontractor and Supplier selection plan and submit the plan to the Owner for approval. CMAR shall apply the plan in the evaluation of the qualifications of Subcontractors and Major Suppliers and provide the Owner with its review and recommendation.
  - 2.8.2.3 CMAR shall obtain Owner approval of the selected Subcontractors and Major Suppliers. If CMAR is to self-perform under this alternative, CMAR shall submit a detailed explanation and demonstration of the cost of the Work it shall self-perform. CMAR shall further provide documentation to demonstrate that for any Work that is self-performed, the cost of any such Work is a reasonable and prudent use of public funds. The Owner shall approve CMAR self-performance of any part of the Work and the cost therefore prior to accepting any GMP Proposal.
  - 2.8.2.4 CMAR shall negotiate costs for services/supplies from each of the Subcontractors and Major Suppliers selected under this method.
  - 2.8.2.5 Within three (3) days of negotiating cost for services/supplies from all Subcontractors and Major Suppliers selected under this method, CMAR shall then prepare a report for the Owner's approval identifying the recommended Subcontractors and Major Suppliers for each category of the Work to be performed. The report shall be in a format approved by the Owner's Representative and shall include, among other things, the amount of each such cost. CMAR shall, at its discretion or at the request of the Owner's Representative, request written verification of any costs selected. CMAR shall provide an explanation of the qualifying factors for each selection.
- 2.8.3 In all other cases, CMAR shall select Subcontractors and Major Suppliers pursuant to the following process, which includes a combination of qualifications and price, derived through competitive bidding or as may otherwise be agreed in writing by the parties. CMAR shall ensure that any such process is fully compliant with Arizona law.
- 2.8.3.1 CMAR shall develop the interest of Subcontractors and Major Suppliers, submit the names of a minimum of three (3) qualified Subcontractors and Major Suppliers selected pursuant to a qualifications-based procedure, for each trade in the Project for approval by the Owner and solicit bids for the various construction categories. If there are not three (3) qualified Subcontractors or Major Suppliers available for a specific trade or there are extenuating circumstances warranting such, CMAR may request approval by the Owner to submit less than three (3) names. Without prior written approval by the Owner, no change in the Owner-approved Subcontractors shall be allowed.

- 2.8.3.2 If CMAR desires to self-perform certain portions of the Work, it shall comply with, and be subject to, the requirements set forth in this Agreement.
- 2.8.3.3 If the Owner objects to any nominated Subcontractors and Major Suppliers to any nominated self-performed Work for good reason, CMAR shall nominate substitute Subcontractors or Major Suppliers.
- 2.8.3.4 CMAR shall distribute drawings and specifications, and when appropriate, conduct a pre-bid conference with prospective Subcontractors and Major Suppliers.
- 2.8.3.5 CMAR shall receive, open, record and evaluate the bids. The apparent low bidders shall be interviewed to determine the responsiveness of their proposals. In evaluating the responsiveness of bid proposals, CMAR, in addition to bid price, shall consider the following factors: past performance on similar projects, qualifications and experience of personnel assigned, quality management plan, approach or understanding of the Work to be performed, and performance schedule to complete the Work. The final evaluation of Subcontractors' and Major Suppliers' bids shall be done with the Owner representative in attendance to observe and witness the process. CMAR shall resolve any Subcontractors' or Major Suppliers' bid withdrawal, protest or disqualification in connection with the award at no increase in the cost of the Work.
- 2.8.4 Upon completion of the Subcontractors or Major Suppliers' selection process, CMAR shall submit a summary report to the Owner of the entire Subcontractor selection process, including, the selected Subcontractors for each category of Work. The report shall indicate, by bid process, all Subcontractors contacted to determine interest, the Subcontractors solicited, the bids received and costs negotiated, compliance with Arizona law.
- 2.8.5 The selected Subcontractors and Major Suppliers shall provide a schedule of values, which shall be used to create the overall Project schedule of values.
- 2.8.6 CMAR shall contract with only Subcontractors and Major Suppliers who are duly licensed in Arizona and qualified to perform the Work per the requirements of the Contract Documents.
- 2.8.7 Regardless of the selection procedure, CMAR is responsible for ensuring that the costs of the Subcontractor's and Major Supplier's services are reasonable and a prudent use of public funds.
- 2.8.8 Regardless of the selection procedure, and in any case, CMAR is solely responsible for the cost and performance of the selected Subcontractors and Major Suppliers. The Owner's approvals under this Agreement are not, and shall not, be construed to be a waiver, in part or in whole, of CMAR's responsibility and obligation to perform as set forth in this Agreement or any subsequent construction agreement or GMP and for the cost, or less than the cost, set forth in any GMP to which the parties agree.

### **ARTICLE 3 - PERIOD OF SERVICES**

- 3.1 The design phase services described in this Agreement shall be performed by CMAR in accordance with the most current updated/revised Project Master Schedule. Failure on the part of CMAR to adhere to the Project Master Schedule requirements for activities for which it is responsible shall be sufficient grounds for termination of this Agreement by the Owner.
  - 3.1.1 If CMAR fails to adhere to the approved Project Master Schedule, the Owner may provide written notice to CMAR that it intends to terminate this Agreement unless the problem cited is cured, or commenced to be cured, within three (3) days of CMAR's receipt of such notice.
- 3.2 If the date of performance of any obligation or the last day of any time period provided for herein should fall on a Saturday, Sunday, or holiday for the Owner, then said obligation shall be due and owing, and said time period shall expire, on the first day thereafter which is not a Saturday, Sunday or legal City holiday. Except as may otherwise be set forth herein, any performance provided for herein shall be timely made if completed no later than 4:00 p.m. (Flagstaff time) on the day of performance.

## ARTICLE 4 - CONTRACT PRICE AND PAYMENTS

### 4.1 CONTRACT PRICE

4.1.1 The Owner shall pay CMAR a Contract Price for the design phase services Work as proposed by CMAR and accepted by the Owner:

Basic Design Phase Services	\$ 700,000.00
Additional Design Phase Services	\$ 0.00
Total Design Phase Services Agreement Contract Price Not to Exceed	\$ 700,000.00

### 4.2 PAYMENTS

4.2.1 Requests for monthly payments by CMAR for design phase services shall be submitted on the Owner's "Contract Payment Request" form and shall be accompanied by a progress report, detailed invoices and receipts, if applicable. Any requests for payment shall include, as a minimum, a narrative description of the tasks accomplished during the billing period, a listing of any Deliverables submitted, and copies of any Subconsultants' requests for payment, plus similar narrative and listings of Deliverables associated with their Work. Payment for services negotiated as a lump sum shall be made in accordance with the percentage of Work completed during the preceding month. Services negotiated as a not-to-exceed fee shall be paid in accordance with the Work effort expended on that service during the preceding month.

4.2.2 Fees for CMAR and any Subconsultants shall be based upon the Hourly Rate Schedule included as Exhibit "B" attached hereto.

4.2.3 CMAR shall pay all sums due Subconsultants for services and reimbursable expenses within fourteen (14) calendar days after CMAR has received payment for those services from the Owner.

4.2.4 CMAR agrees that no charges or claims for costs or damages of any type shall be made by it for any delays or hindrances beyond the reasonable control of the Owner during the progress of any portion of the services specified in this Agreement. Such delays or hindrances, if any, shall be solely compensated for by an extension of time for such reasonable period as may be mutually agreed between the parties. It is understood and agreed, however, that permitting CMAR to proceed to complete any services, in whole or in part after the date to which the time of completion may have been extended, shall in no way act as a waiver on the part of the Owner of any of its legal rights herein.

4.2.5 No compensation to CMAR shall be allowed contrary to Article I, Chapter I, Title 34 of the Arizona Revised Statutes.

4.2.6 If any service(s) executed by CMAR is delayed or suspended in whole or in part, for a period of more than one hundred eighty (180) days through no fault of CMAR, CMAR shall be paid for the services performed prior to the delay or suspension.

4.2.7 In no event shall the Owner pay more than ninety percent (90%) of the Contract Price until final acceptance of all design phase services, and award of the final approved GMP for the entire Project by City Council.

### 4.3 ADDITIONAL DESIGN PHASE SERVICES

4.3.1 CMAR may be required to provide services in excess of those identified in this Agreement. Mark-ups are not authorized and only the reimbursables specifically identified below shall be reimbursed as authorized herein. Any additional services shall be requested by the Owner, in writing, prior to the delivery of said services. There shall be no payment by the Owner for any additional services provided prior to or without the written request of the Owner for said services.

- 4.3.2 When authorized by the Owner, CMAR shall be entitled to reimbursement at cost of design phase services related expenses incurred for the following items:
  - 4.3.2.1 Reasonable charges for air transportation (not to exceed standard coach rates), ground travel (for automobile rental, taxi, parking, etc. not to exceed \$50 per day), and authorized expenses while traveling (not to exceed the corporate rate at major business hotels in the area and a per diem for meal and miscellaneous business expenses of \$45) shall be reimbursed. CMAR shall provide detailed receipts for all reimbursable charges. Travel expenses shall not exceed \$0.00 without further approval of the Owner.
  - 4.3.2.2 Non-overhead printing expenses incurred including the printing of Construction Documents for bidding, courier services or other Project-related services that may be requested by the Owner. The cost of such service shall not exceed \$ 0.00 (reimbursable allowance) without further approval by the Owner.

## **ARTICLE 5 - OWNER'S RESPONSIBILITIES**

- 5.1 The Owner, at no cost to CMAR, shall furnish the following information:
  - 5.1.1 One (1) copy of data the Owner determines pertinent to the work. However, CMAR shall be responsible for searching the records and requesting information it deems reasonably required for the Project.
  - 5.1.2 All available data and information pertaining to relevant policies, standards, criteria, studies, etc.
  - 5.1.3 The name of the person designated to be the Owner's representative during the term of this Agreement. The Owner's Representative has the authority to administer this Agreement and shall monitor CMAR's compliance with all terms and conditions stated herein. All requests for information from or decisions by the Owner on any aspect of the work or Deliverables shall be directed to the Owner's Representative.
- 5.2 The Owner additionally shall:
  - 5.2.1 Contract separately, with one or more Design Professional(s), to provide architectural and/or engineering design services for the Project. The scope of services for the Design Professional(s) shall be provided to CMAR for its information. CMAR shall have no right, to limit or restrict any changes of such services that are otherwise mutually acceptable to the Owner and Design Professional(s).
  - 5.2.2 Supply, without charge, all necessary copies of programs, reports, drawings, and specifications reasonably required by CMAR except for those copies whose cost has been reimbursed by the Owner.
  - 5.2.3 Provide CMAR with adequate information in its possession or control regarding the Owner's requirements for the Project.
  - 5.2.4 Give prompt written notice to CMAR when the Owner becomes aware of any default or defect in the Project or non-conformance with the Drawings and Specifications, or any of the services required hereunder. Upon notice of failure to perform, the Owner may provide written notice to CMAR that it intends to terminate this Agreement unless the problem cited is cured, or commenced to be cured, within three (3) days of CMAR's receipt of such notice.
  - 5.2.5 Notify CMAR of changes affecting the budget allocations or schedule.
- 5.3 The Owner's Representative shall have authority to approve the Project Budget and Project Master Schedule and render decisions and furnish information the Owner's Representative deems appropriate to CMAR.

## ARTICLE 6 - AGREEMENT CONDITIONS

### 6.1 PROJECT DOCUMENTS AND COPYRIGHTS

- 6.1.1 Owner Ownership of Project Documents. All work products (electronically or manually generated) including but not limited to: cost estimates, studies, design analyses, original mylar drawings, Computer Aided Drafting and Design (CADD) file diskettes, and other related documents which are prepared specifically in the performance of this Agreement (collectively referred to as Project Documents) are to be and remain the property of the Owner and are to be delivered to the Owner's Representative before the final payment is made to CMAR. Nonetheless, in the event these Projects Documents are altered, modified or adapted without the written consent of CMAR, which consent CMAR shall not unreasonably withhold, the Owner agrees to hold CMAR harmless to the extent permitted by law, from the legal liability arising out of and or resulting from the Owner's alteration, modification or adaptation of the Project Documents.
- 6.1.2 CMAR to Retain Copyrights. The copyrights, patents, trade secrets or other intellectual property rights associated with the ideas, concepts, techniques, inventions, processes or works of authorship developed or created by CMAR, its Subcontractors or personnel, during the course of performing this Agreement or arising out of the Project shall belong to CMAR.
- 6.1.3 License to Owner for Reasonable Use. CMAR hereby grants, and shall require its Subcontractors to grant, a license to the Owner, its agents, employees, and representatives for an indefinite period of time to reasonably use, make copies, and distribute as appropriate the Project Documents, works or Deliverables developed or created for the Project and this Agreement. This license shall also include the making of derivative works as guided by this Agreement.
- 6.1.4 Documents to Bear Seal. When applicable and required by state law, CMAR and its Subcontractors shall endorse by an Arizona professional seal all plans, works, and Deliverables prepared by them for this Agreement.
- 6.1.5 Records Inspection. The Owner and its employees, agents, and authorized representatives shall have the right at all reasonable times and during all business hours to inspect and examine CMAR's records related to this Agreement.
- 6.1.6 Record Retention. CMAR shall comply with the Owner's record retention policy regarding all records associated with the Project. This record retention requirement shall remain in effect following expiration of the Agreement or termination of the Agreement by either Party.

### 6.2 COMPLETENESS AND ACCURACY OF CMAR'S WORK

- 6.2.1 CMAR shall be responsible for the completeness and accuracy of its reviews, reports, supporting data, and other design phase Deliverables prepared or compiled pursuant to its obligations under this Agreement and shall at its sole expense correct its work or Deliverables. Any damage incurred by the Owner as a result of additional construction cost caused by such willful or negligent errors, omissions or acts shall be chargeable to CMAR to the extent that such willful or negligent errors, omissions and acts fall below the standard of care and skill that a professional CMAR in Flagstaff, Arizona would exercise under similar conditions. The fact that the Owner has accepted or approved CMAR's Work or Deliverables shall in no way relieve CMAR of any of its responsibilities under this Agreement, nor does this requirement to correct the Work or Deliverables constitute a waiver of any claims or damages otherwise available by law or this Agreement to the Owner. Correction of errors, omissions and acts discovered on architectural or engineering plans and specifications shall be the responsibility of the Design Professional(s).

### **6.3 ALTERATION IN CHARACTER OF WORK**

- 6.3.1 In the event an unanticipated or unforeseen alteration or modification in the character of Work or Deliverables results in a substantial change in this Agreement, thereby materially increasing or decreasing the scope of services, cost of performance, or Project Master Schedule, the Work or Deliverables shall nonetheless be performed as directed by the Owner. However, before any altered or modified Work begins, a Change Order or Amendment shall be approved and executed by the Owner and CMAR. Such Change Order or Amendment shall not be effective until approved by the Owner.
- 6.3.2 Additions to, modifications, or deletions from the Project provided herein may be made, and the compensation to be paid to CMAR may accordingly be adjusted by mutual agreement of the contracting parties.
- 6.3.3 No claim for extra work done, or materials furnished, by CMAR shall be allowed by Owner except as provided herein, nor shall CMAR do any work or furnish any material(s) not covered by this Agreement unless such work or material is first authorized in writing. Work or material(s) furnished by CMAR without such prior written authorization shall be at CMAR's sole jeopardy, cost, and expense, and CMAR hereby agrees that without prior written authorization no claim for compensation for such work or materials furnished shall be made.

### **6.4 DATA CONFIDENTIALITY**

- 6.4.1 As used in this Agreement, data ("Data") means all information, whether written or verbal, including plans, photographs, studies, investigations, audits, analyses, samples, reports, calculations, internal memos, meeting minutes, data field notes, work product, proposals, correspondence and any other similar documents or information prepared by or obtained by CMAR in the performance of this Agreement.
- 6.4.2 The parties agree that all Data, including originals, images, and reproductions, prepared by, obtained by, or transmitted to CMAR in connection with CMAR's performance of this Agreement is confidential and proprietary information belonging to the Owner.
- 6.4.3 CMAR shall not divulge Data to any third party without prior written consent of the Owner. CMAR shall not use the Data for any purposes except to perform the services required under this Agreement. These prohibitions shall not apply to the following Data:
- 6.4.3.1 Data, which was known to CMAR prior to its performance under this Agreement unless such data was acquired in connection with work performed for the Owner;
- 6.4.3.2 Data which was acquired by CMAR in its performance under this Agreement and which was disclosed to CMAR by a third party, who to the best of CMAR's knowledge and belief, had the legal right to make such disclosure and CMAR is not otherwise required to hold such data in confidence; or
- 6.4.3.3 Data which is required to be disclosed by CMAR by virtue of law, regulation, or court.
- 6.4.4 In the event CMAR is required or requested to disclose Data to a third party, or any other information to which CMAR became privy because of any other Agreement with the Owner, CMAR shall first notify the Owner as set forth in this Article of the request or demand for the Data. CMAR shall timely give the Owner sufficient facts, such that the Owner can have a meaningful opportunity to either first give its consent or take such action that the Owner may deem appropriate to protect such Data or other information from disclosure.
- 6.4.5 CMAR, unless prohibited by law, within ten (10) calendar days after completion of services for a third party on real or personal property owned or leased by the Owner, shall promptly deliver, as set forth in this section, a copy of all Data to the Owner. All Data shall continue to be subject to the confidentiality agreements of this Agreement.

6.4.6 CMAR assumes all liability for maintaining the confidentiality of the Data in its possession and agrees to compensate the Owner if any of the provisions of this section are violated by CMAR, its employees, agents or Subconsultants. Solely for the purposes of seeking injunctive relief, it is agreed that a breach of this section shall be deemed to cause irreparable harm that justifies injunctive relief in court.

## **6.5 PROJECT STAFFING**

6.5.1 Prior to the start of any work or Deliverables under this Agreement, CMAR shall submit to the Owner, an organization chart for CMAR staff and Subcontractors and detailed resumes of key personnel listed in its response to the Owner's Request for Qualifications or subsequent fee proposals (or revisions thereto), that shall be involved in performing the services prescribed in this Agreement. Unless otherwise informed, the Owner hereby acknowledges its acceptance of such personnel to perform such services under this Agreement. In the event CMAR desires to change such key personnel from performing such services under this Agreement, CMAR shall submit the qualifications of the proposed substituted personnel to the Owner for prior approval. Key personnel shall include, but are not limited to, principal-in-charge, project manager, superintendent, project director or those persons specifically identified to perform services of cost estimating, scheduling, value engineering, and procurement planning.

6.5.2 CMAR shall maintain an adequate number of competent and qualified persons, as determined by the Owner, to ensure acceptable and timely completion of the scope of services described in this Agreement throughout the period of those services. If the Owner objects, with reasonable cause, to any of CMAR's staff, CMAR shall take prompt corrective action acceptable to the Owner and, if required, remove such personnel from the Project and replace with new personnel acceptable to the Owner.

## **6.6 INDEPENDENT CONTRACTOR**

6.6.1 CMAR is and shall be an independent contractor and whatever measure of control the Owner exercises over the work or Deliverables pursuant to this Agreement shall be as to the results of the Work only. No provision in this Agreement shall give, or be construed to give, the Owner the right to direct CMAR as to the details of accomplishing the work or Deliverables. These results shall comply with all applicable laws and ordinances.

## **6.7 SUBCONTRACTORS**

6.7.1 Prior to beginning the work or Deliverables, CMAR shall furnish, for the Owner's approval, the names of all Subcontractors to be used on this Project. All subsequent changes shall be subject to the approval of the Owner.

## **6.8 TERMINATION**

6.8.1 The Owner and CMAR hereby agree to the full performance of the covenants contained herein, except that the Owner reserves the right, at its discretion and without cause, to terminate any or all services provided for in this Agreement or terminate any portion of the Project for which services have been performed by CMAR.

6.8.2 In the event the Owner terminates any or all of the services or any part of the services as herein provided, the Owner shall so notify CMAR in writing, and CMAR shall immediately after receiving such notice, discontinue advancing the Work specified under this Agreement and mitigate the expenditure, if any, of costs resulting from such termination.

6.8.3 CMAR, upon such termination, shall promptly deliver to the Owner all reports, estimates and other Work or Deliverables entirely or partially completed, together with all unused materials supplied by the Owner.

6.8.4 CMAR shall appraise the Work completed and submit an appraisal to the Owner for evaluation. The Owner shall have the right to inspect CMAR's Work or Deliverables to appraise the Work completed.

6.8.5 CMAR shall receive compensation in full for services satisfactorily performed to the date of such termination and the reasonable direct costs and direct expenses attributable to such termination. The fee shall be paid in accordance with this Agreement and shall be an amount mutually agreed upon by CMAR and the Owner. The Owner shall make the final payment within sixty (60) days after CMAR has delivered the last of the partially or otherwise completed Work items and the final fee has been agreed upon.

## **6.9 DISPUTE AVOIDANCE AND RESOLUTION**

6.9.1 The parties are fully committed to working with each other throughout the Project and agree to communicate regularly with each other at all times so as to avoid or minimize disputes or disagreements. If disputes or disagreements do arise, CMAR and Owner each commit to resolving such disputes or disagreements in an amicable, professional and expeditious manner so as to avoid unnecessary losses, delays and disruptions to the Work.

6.9.2 CMAR and the Owner shall first attempt to resolve disputes or disagreements at the field level through discussions between CMAR's Representative and the Owner's Representative.

6.9.3 If a dispute or disagreement cannot be resolved through CMAR's Representative and the Owner's Representative, CMAR's Senior Representative and the Owner's Senior Representative, upon the request of either party, shall meet as soon as conveniently possible, but in no case later than thirty (30) days after such a request is made, to attempt to resolve such dispute or disagreement. Prior to any meetings between the Senior Representatives, the parties shall exchange relevant information that shall assist the parties in resolving their dispute or disagreement.

6.9.4 Except as otherwise agreed by the parties, any litigation brought by either party against the other to enforce the provisions of this Agreement shall be filed in the Coconino County Superior Court and Arizona law shall apply and control. In the event any action at law or in equity is instituted between the parties in connection with this Agreement, the prevailing party in the action shall be entitled to its costs including reasonable attorneys' fees and court costs from the non-prevailing party.

## **6.10 WITHHOLDING PAYMENT**

6.10.1 The Owner reserves the right to withhold funds from the Owner's progress payments up to the amount equal to the claims the Owner may have against CMAR, until such time that a settlement on those claims has been reached.

## **6.11 RECORDS/AUDIT**

6.11.1 Records of CMAR's direct personnel payroll, reimbursable expenses pertaining to the Project and records of accounts between the Owner and CMAR shall be kept on a generally recognized accounting basis and shall be available for up to three (3) years following final completion of the Project. The Owner, its authorized representative, and/or the appropriate federal agency, reserve the right to audit CMAR's records to verify the accuracy and appropriateness of all pricing data, including data used to negotiate this Agreement and any Change Orders. The Owner reserves the right to decrease the Contract Price and/or payments made under this Agreement if, upon audit of CMAR's records, the audit discloses that CMAR has provided false, misleading, or inaccurate cost and pricing data.

6.11.2 CMAR shall include a provision identifying that generally recognized accounting practices shall be included in all of its agreements with Subconsultants, Subcontractors, and Suppliers providing services under this Agreement to ensure the Owner, its authorized representative, and/or the appropriate federal agency, has access to the Subconsultants', Subcontractors', and Suppliers' records to verify the accuracy of cost and pricing data. The Owner reserves the right to decrease the Contract Price and/or payments made under this Agreement if the above provision is not included in Subconsultant, Subcontractor, and Supplier Agreements, and one or more of those parties do not allow the Owner to audit their records to verify the accuracy and appropriateness of pricing data.

## 6.12 INDEMNIFICATION

- 6.12.1 To the fullest extent permitted by law, CMAR agrees to defend, indemnify and hold harmless the Owner, its officers, agents and employees, and any jurisdiction or agency issuing permits for any Work included in the Project, their officers, agents and employees, hereinafter individually and collectively referred to as "indemnitee", from all suits and claims, including attorney's fees and cost of litigation, actions, losses, damage, expenses, costs or claims of any character or any nature relating to, arising out of, or alleged to have resulted from the negligent, reckless, or intentional acts, errors, mistakes, omissions, work or services of the CMAR related to the Work or Deliverables done in fulfilling the terms of this Agreement, or on account of any act, claim or amount arising out of or recovered under Workmen's Compensation Law, or arising out of the failure of CMAR to conform to any statutes, ordinances, regulation, law or court decree. It is agreed that CMAR shall be responsible for primary loss investigation, defense and judgment costs where this Agreement of indemnity applies.

## 6.13 NOTICES

- 6.13.1 Notices or demands required to be given under this Agreement, may be given in writing, delivered in person, sent by facsimile transmission, emailed, deposited in the United States mail, postage prepaid, or deposited with any commercial air courier or express service at the addresses set forth below, or to such other address as the Parties may substitute by written notice. However, notices of termination, notices of default and any notice regarding warranties shall be sent via registered or certified mail, return receipt requested at the address set forth below **and** to legal counsel for the party to whom the notice is being given.

to CMAR:

Loven-Fann Joint Venture  
1100 S. Pinnacle St  
Flagstaff, AZ 86001  
Attn: Jon Hansen  
Phone: 928-310-8031  
[jhansen@lovencontracting.com](mailto:jhansen@lovencontracting.com)

to Owner:

City of Flagstaff  
211 West Aspen Avenue  
Flagstaff, Arizona 86001  
Attn: Emily Markel, Purchasing Manager  
Phone: (928) 213-2276  
[emarkel@flagstaffaz.gov](mailto:emarkel@flagstaffaz.gov)

With a copy to:

City of Flagstaff  
6200 S. Pulliam Dr. Ste. 204  
Flagstaff, AZ 86005  
Attn: Adam Miele, P.E., Airport Programs Manager  
Phone: (928) 213-2933  
[AMiele@flagstaffaz.gov](mailto:AMiele@flagstaffaz.gov)

With a copy to Design Professionals:

Adam Siros  
APMI Architecture  
3003 N Central Ave #1100  
Phoenix, AZ 85012  
480-226-0185  
[asiros@apmi.com](mailto:asiros@apmi.com)

Or to other such place and with such other copies as either party may designate as to itself by written notice to the other party. Rejection, any refusal to accept, or the inability to deliver because of changed address of which no notice was given shall be deemed to be receipt of the notice as of the date of such rejection, refusal, or inability to deliver.

#### **6.14 COMPLIANCE WITH ALL LAWS**

6.14.1 CMAR will comply with all applicable Federal, State, County and City laws, regulations and policies. CMAR understands and acknowledges the applicability of the Americans with Disabilities Act, the Immigration Reform and Control Act of 1986 and the Drug Free Workplace Act of 1989. CMAR agrees to comply with these laws in performing the Contract Documents and to permit the Owner to verify such compliance.

#### **6.15 CONFLICT OF INTEREST**

6.15.1 To evaluate and avoid potential conflicts of interest, CMAR shall provide written notice to the Owner of any work or services performed by CMAR for third-parties that may involve or be associated with any real property or personal property owned or leased by the Owner. Such notice shall be given at least seven (7) business days prior to commencement of the Project by CMAR for a third party, or at least seven (7) business days prior to an adverse action as defined below. Written notice and disclosure shall be sent to:

Patrick Brown  
Purchasing Director  
City of Flagstaff  
211 West Aspen Avenue  
Flagstaff, Arizona 86001

6.15.2 Actions considered to be adverse to the Owner under this Agreement include but are not limited to:

6.15.2.1 Using Data, as defined in this Agreement, acquired in connection with this Agreement to assist a third party in pursuing administrative or judicial action against the Owner;

6.15.2.2 Filing a notice of claim or lawsuit against the City of Flagstaff, testifying or providing evidence on behalf of any person in connection with an administrative or judicial action against the City of Flagstaff; or

6.15.2.3 Using Data to produce income for CMAR or its employees independently of performing the services under this Agreement, without the prior written consent of the Owner.

6.15.3 CMAR represents that except for those persons, entities and projects previously identified in writing to the Owner, the services to be performed by CMAR under this Agreement are not expected to create an interest with any person, entity, or third-party project that is or may be adverse to the interests of the Owner.

6.15.4 CMAR's failure to provide a written notice and disclosure of the information as set forth in this section shall constitute a material breach of this Agreement.

## **6.16 CONTRACTOR'S LICENSE**

- 6.16.1 Prior to award of this Agreement, CMAR shall provide to the Procurement Section, its Contractor's License Classification and number and its Federal Tax I.D. number.

## **6.17 SUCCESSORS AND ASSIGNS**

- 6.17.1 The Owner and CMAR and their partners, successors, assigns, and legal representatives shall each be bound to the other party to this Agreement and to the partners, successors, assigns, and legal representatives of such other party in respect to all covenants of this Agreement. Neither the Owner nor CMAR shall assign, sublet, or transfer its interest in this Agreement without the written consent of the other. In no event shall any contractual relationship be created or be construed to be created as between any third party and the Owner. Notwithstanding the Owner's consent to assignment, CMAR as Assignor, and the Assignee shall both remain liable under all rights, obligations, terms, and conditions of this Agreement.

## **6.18 FORCE MAJEURE**

- 6.18.1 The parties acknowledge that there may be events that occur during the term of this Agreement that are beyond the control of both the Owner and the CMAR, including events of war, floods, labor, disputes, earthquakes, epidemics, pandemics, adverse weather conditions not reasonably anticipated, forest fires, and other acts of God. These events may result in temporary delay or permanent shut down of the work that is the subject of this Agreement. This may be caused by such things as stay-at-home orders, loss of labor force, supply chain delays, and other impediments to timely delivery of the Agreement.
- 6.18.2 The parties agree that there will be no claims arising from a temporary delay or permanent shut down caused by the events described above and that the Owner will pay no additional costs incurred because of such events.
- 6.18.3 The parties agree to act in good faith to extend the Contract completion date without any penalty to the Contractor and that the extension will be in an amount of time equal to any temporary delay. This term supersedes all other terms regarding temporary delay, permanent shut down, or increased costs.

## **6.19 COVENANT AGAINST CONTINGENT FEES**

- 6.19.1 CMAR warrants that no person has been employed or retained to solicit or secure this Agreement upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, and that no member of the City Council, or any employee of the Owner has any interest, financially, or otherwise, in CMAR. The Owner shall in the event of the breach or violation of this warranty, have the right to annul this Agreement without liability, or at its discretion to deduct from the Contract Price or consideration, the full amount of such commission, percentage, brokerage, or contingent fee.

## **6.20 NON-WAIVER PROVISION**

- 6.20.1 The failure of either party to enforce any of the provisions of this Agreement or to require performance by the other party of any of the provisions hereof shall not be construed to be a waiver of such provisions, nor shall it affect the validity of this Agreement or any part thereof, or the right of either party to thereafter enforce each and every provision.

## **6.21 JURISDICTION**

- 6.21.1 This Agreement shall be deemed to be made under, and shall be construed in accordance with, and governed by the laws of the State of Arizona, without regard to the conflicts or choice of law provisions thereof. An action to enforce any provision of this Agreement or to obtain any remedy with respect hereto shall be brought in the Superior Court, Coconino County, Arizona, and for this purpose, each party hereby expressly and irrevocably consents to the jurisdiction and venue of such Court.

## **6.22 SURVIVAL**

6.22.1 All warranties, representations and indemnifications by CMAR shall survive the completion or termination of this Agreement.

## **6.23 MODIFICATION**

6.23.1 No supplement, modification, or amendment of any term of this Agreement shall be deemed binding or effective unless in writing and signed by the parties hereto and in conformation with provisions of this Agreement, except as expressly provided herein to the contrary.

## **6.24 SEVERABILITY**

6.24.1 If any provision of this Agreement or the application thereof to any person or circumstance shall be invalid, illegal or unenforceable to any extent, the remainder of this Agreement and the application thereof shall not be affected and shall be enforceable to the fullest extent permitted by law.

## **6.25 INTEGRATION**

6.25.1 This Agreement contains the full agreement of the parties hereto. Any prior or contemporaneous written or oral agreement between the parties regarding the subject matter hereof is merged and superseded hereby.

## **6.26 TIME IS OF THE ESSENCE**

6.26.1 Time of each of the terms, covenants, and conditions of this Agreement is hereby expressly made of the essence.

## **6.27 THIRD PARTY BENEFICIARY**

6.27.1 This Agreement shall not be construed to give any rights or benefits in the Agreement to anyone other than the Owner and CMAR. All duties and responsibilities undertaken pursuant to this Agreement shall be for the sole and exclusive benefit of the Owner and CMAR and not for the benefit of any other party.

## **6.28 COOPERATION AND FURTHER DOCUMENTATION**

6.28.1 CMAR agrees to provide the Owner such other duly executed documents as may be reasonably requested by the Owner to implement the intent of this Agreement.

## **6.29 CONFLICT IN LANGUAGE**

6.29.1 All Work or Deliverables performed shall conform to all applicable Owner codes, ordinances and requirements as outlined in this Agreement. If there is a conflict in interpretation between provisions in this Agreement and any Exhibits, the provisions in this Agreement shall prevail.

## **6.30 CANCELLATION FOR CONFLICT OF INTEREST**

6.30.1 All parties hereto acknowledge that this Agreement is subject to cancellation for conflict of interest by the Owner pursuant to the provisions of A.R.S. Section 38-511.

## **6.31 CONFIDENTIALITY OF PLANS & SPECIFICATIONS**

6.31.1 Any plans or specifications received by CMAR regarding the Project are for official use only. CMAR may not share them with others except as required to fulfill Agreement obligations with the Owner.

**6.32 NO BOYCOTT OF ISRAEL**

6.32.1 Pursuant to A.R.S. §§ 35-393 and 35-393.01, if a Party has over ten (10) employees and the Agreement is worth at least one-hundred thousand dollars and no cents (\$100,000), the Party shall certify that it is not currently engaged in, and agrees, for the duration of the Agreement, will not engage in a boycott of Israel.

**6.33 FORCED LABOR OF ETHNIC UYGHURS**

6.33.1 If CMAR engages in for-profit activity and has ten (10) or more employees, pursuant to A.R.S. §35-394, CMAR certifies that it does not currently, and agrees for the duration of the contract that it will not, use: 1) the forced labor of ethnic Uyghurs in the People’s Republic of China; 2) any goods or services produced by the forced labor of ethnic Uyghurs in the People’s Republic of China; and 3) any contractors, subcontractors or suppliers that use the forced labor or any goods or services produced by the forced labor of ethnic Uyghurs in the People’s Republic of China. If CMAR becomes aware during the term of the Contract that the company is not in compliance with the written certification, CMAR shall notify the Owner within five business days after becoming aware of the noncompliance. If CMAR does not provide the Owner with a written certification that CMAR has remedied the noncompliance within 180 days after notifying the Owner of the noncompliance, this Contract terminates, except that if the Contract termination date occurs before the end of the remedy period the Contract terminations on the Contract termination date.

**ARTICLE 7 - INSURANCE**

CMAR shall procure and maintain for the duration of this Agreement, insurance against claims for injury to persons or damage to property which may arise from or in connection with the performance of the Work or Deliverables hereunder by CMAR, its agents, representatives, employees, Subconsultants, Subcontractors, and/or Suppliers. Insurance requirements related to any construction Work done during the design phase or during the construction phase shall be defined in a separate Agreement associated with the construction phase. CMAR shall cause all Subcontracts to contain identical terms and conditions to those included in this Article.

The insurance requirements herein are minimum requirements for this Agreement and in no way limit the indemnity covenants that might arise out of the performance of the Work or Deliverables under this Agreement by CMAR, its agents, representatives, employees, Subconsultants, Subcontractors, or Suppliers and CMAR is free to purchase such additional insurance as it may determine necessary.

**7.1 MINIMUM SCOPE AND LIMITS OF INSURANCE**

7.1.1 Loven Contracting, Inc. and Fann Contracting, Inc., as participants in the Loven-Fann Joint Venture, shall provide coverage at least as broad and with limits of liability not less than those stated below.

7.1.1.1 Commercial General Liability-Occurrence Form

General Aggregate/per project	\$10,000,000/ <del>\$5,000,000</del>
Products-Completed Operations Aggregate	\$1,000,000
Each Occurrence	\$1,000,000

7.1.1.2 Automobile Liability-Any Auto or Owned, Hired and Non-Owned Vehicles

Combined Single Limit Per Accident for Bodily Injury and Property Damage	\$2,000,000
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The policy shall be endorsed to include the following additional insured language:

**"The City of Flagstaff shall be named as an additional insured with respect to liability arising out of the activities performed by, or on behalf of Loven Contracting, Inc., including automobiles owned, leased, hired or borrowed by Loven Contracting, Inc."**

**"The City of Flagstaff shall be named as an additional insured with respect to liability arising out of the activities performed by, or on behalf of Fann Contracting, Inc., including automobiles owned, leased, hired or borrowed by Fann Contracting, Inc."**

7.1.1.3 Workers Compensation and Employers Liability

CMAR shall carry Workers' Compensation insurance to cover obligations imposed by federal and state statutes.

7.1.2 Self-Insured Retentions

Any self-insured retentions and deductibles greater than \$10,000 shall be declared to and approved by the Owner.

**7.2 OTHER INSURANCE REQUIREMENTS**

7.2.1 The Commercial General Liability and Automobile Liability policies are to contain, or be endorsed to contain, the following provisions:

**"The City of Flagstaff, its officers, officials, agents, volunteers, and employees, are to be named as additional insureds with respect to liability arising out of: activities performed by or on behalf of Loven Contracting, Inc., including the City of Flagstaff's general supervision of Loven Contracting, Inc.; products and completed operations of Loven Contracting, Inc.; and automobiles owned, leased, hired, or borrowed by Loven Contracting, Inc."**

**"The City of Flagstaff, its officers, officials, agents, volunteers, and employees, are to be named as additional insureds with respect to liability arising out of: activities performed by or on behalf of Fann Contracting, Inc., including the City of Flagstaff's general supervision of Fann Contracting, Inc.; products and completed operations of Fann Contracting, Inc.; and automobiles owned, leased, hired, or borrowed by Fann Contracting, Inc."**

7.2.1.2 The Commercial General Liability Insurance shall contain broad form contractual liability coverage and shall not exclude liability arising out of the explosion, collapse, or underground hazard ("EXU").

7.2.1.3 The City, its officers, officials, agents, and employees shall be additional insureds to the full limits of liability purchased by CMAR, even if those limits of liability are in excess of those required by this Agreement. The Commercial General Liability additional insured endorsement shall be at least as broad as the Insurance Service Office, Inc.'s Additional Insured, Form B CG 20 10 11 85.

7.2.2 CMAR's insurance coverage shall be primary insurance with respect to the City, its officers, officials, agents, and employees. Insurance or self-insurance maintained by the City, its officers, officials, agents, and employees shall be in excess of CMAR's insurance and shall not contribute to it.

7.2.3 CMAR's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability. The coverage provided by CMAR and its Subcontractors shall not be limited to the liability assumed under the indemnification provisions of this Agreement.

7.2.4 The policies shall contain a waiver of subrogation against the City, its officers, officials, agents, and employees for losses arising from Work performed for the Owner.

7.2.5 Workers' Compensation and Employers Liability policies are to contain, or be endorsed to contain, the following: The insurer shall agree to waive all rights of subrogation against the City, its officers, officials, agents, and employees for losses arising from work performed for the Owner.

### **7.3 SUBCONTRACTOR INSURANCE**

7.3.1 CMAR's certificate(s) shall include all Subcontractors as insureds under its policies. All coverages for Subcontractors shall be subject to the minimum requirements identified above.

### **7.4 NOTICE OF CANCELLATION**

7.4.1 Each insurance policy required by the insurance provisions of this Agreement shall provide the required coverage and not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days prior written notice has been given, by certified mail, return receipt requested to:

Emily Markel  
Purchasing Manager  
City of Flagstaff  
211 West Aspen Avenue  
Flagstaff, Arizona 86001  
emarkel@flagstaffaz.gov

### **7.5 ACCEPTABILITY OF INSURERS**

7.5.1 Insurance is to be placed with insurers duly licensed companies in the State of Arizona, and with an A.M. Best's rating of no less than A-,7, or as approved by the City and licensed in the State of Arizona with policies and forms satisfactory to the City. The Owner in no way warrants that the above required minimum insurer rating is sufficient to protect CMAR from potential insurer insolvency.

### **7.6 VERIFICATION OF COVERAGE**

7.6.1 CMAR shall furnish the Owner, Certificates of Insurance (ACORD form or equivalent approved by the Owner) with original endorsements effecting coverage as required by this Agreement. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. Any policy endorsement(s) that restricts or limits coverages shall be clearly noted on the Certificate of Insurance.

7.6.2 All certificates and endorsements are to be received and approved by the Owner before work commences. Each insurance policy required by this Agreement shall be in effect at or prior to the earlier of commencement of work under this Agreement or signing of this Agreement, and remain in effect for the duration of the Project. Failure to maintain the insurance policies as required by this Agreement or to provide evidence of renewal shall constitute a material breach of this Agreement.

7.6.3 All Certificates of Insurance required by this Agreement shall be sent directly to the Contracts Division. The Project Number and Project description shall be included on the Certificates of Insurance. The Owner reserves the right to require complete, certified copies of all insurance policies required by this Agreement at any time.

### **7.7 APPROVAL**

7.7.1 Any modification or variation from the insurance requirements in this Agreement shall be approved by the City Attorney's Office, whose decision shall be final. Such action shall not require a formal Agreement amendment but may be made by administrative action.

This Agreement shall be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**IN WITNESS WHEREOF**, the parties hereto have executed this Agreement on \_\_\_\_\_.

CONSTRUCTION MANAGER AT RISK

\_\_\_\_\_

Print name: \_\_\_\_\_

Title: \_\_\_\_\_

CITY OF FLAGSTAFF

\_\_\_\_\_

Print name: \_\_\_\_\_

Title: \_\_\_\_\_

Attest:

\_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney's Office

Notice to Proceed issued: \_\_\_\_\_, 20\_\_

## EXHIBIT A – PROJECT DESCRIPTION

The City (Owner) is planning to develop a portion of the Flagstaff Pulliam Airport (Airport) for the Snow Removal Equipment Building (SREB). New construction of the SREB will be approximately 25,000 SF to support vehicle storage and a maintenance shop. The SREB will be capable of supporting the Flagstaff Airport's Snow and Ice Control Plan for multiple 24-hour operational periods. The development site is 6200 S. Pulliam Dr (APN 116-61-004) of the Airport in the PF (Public Facility) Zone. The SREB will provide easy and swift response by snow clearing crews to control snow and ice conditions at the Airport. The entire Project site area is approximately 4.5 acres within the larger Airport site, which is 31.1 acres. The scope of work includes construction of a new SREB and associated site improvements. The SREB will include a maintenance bay, equipment and material storage and associated support areas. It will be necessary to re-work the existing road to the Airport Traffic Control Tower (S. Liberator Lane) (ATCT), a new detention basin, space for equipment turning movements, equipment yard and parking for employees.

The Contractor shall coordinate with Design Professionals selected by the Owner and assist in: (1) the design of the Airport SREB Project (Project); and (2) to construct the Project. The region surrounding Flagstaff, Arizona averages 100 inches of snow annually (NCDC/NOAA archives). Under FAA Advisory Circular (AC) 150/5200-30D, snow and ice should be removed as quickly as possible, with a goal to maintain runways, taxiways, and high-speed turnoffs in a "no worse than wet" condition. Currently, the Airport does not have a large capacity to store snow removal equipment. As a result, the Airport is unable to return the runway to conditions that are compliant with AC 15/5200-30D during winter storms.

The existing snow removal equipment is stored in the airport's Aircraft Rescue and Fire Fighting (ARFF) building. Thus, the Project will allow the Airport to store equipment and additional materials to manage and maintain upkeep of the Airport during winter months. The site for the new SRBE is adjacent to the ARFF building and ATCT and across from Taxiway A. The construction of the Project will include:

1. The construction of approx. 25,000-sf SREB with a maximum height of 28 feet.
2. The construction of approx. 1,680-sf parking lot.
3. The construction of approx. 30,000-sf low impact development (LID) basin to manage stormwater runoff. (Per FAA requirements, water collected in the stormwater basin will be drained within 48 hours.)

The Project will also involve the paving of a small parking lot on the southwest side of the SREB. The parking lot will consist of nine parking spaces including an electric vehicle stall and an American with Disabilities Act (ADA) compliant space. Trenching will be necessary for utilities to connect to existing infrastructure from the southwestern corner of the proposed SREB, and the Project will relocate portions of existing fencing along the western side of the SREB.

## **EXHIBIT B – PROPOSAL AND HOURLY RATE SCHEDULE**

(See Attached Fee Sheet)

## EXHIBIT C - SUBMITTAL REQUIREMENTS FOR THE GMPs

Submit an electronic/(PDF) GMP Proposal or Proposals to the Owner's Project Representative.

Table of Contents:

1. Scope of Work
2. Summary of the GMP
3. Schedule of Values
4. List of Plans and Specifications
5. List of Clarifications and Assumptions
6. Project Master Schedule

### 1. Scope of work

Include the Contract 2024-114, Project Name, and submittal date. Provide a brief description of the work to be performed by CMAR and major points that CMAR and the Owner shall be aware of pertaining to the scope.

### 2. Summary of the GMP

Include a total cost for each of the cost components of the GMP requested under this Agreement. The CMAR shall present this information in the format shown on the attached table. All costs should be listed individually for future use. The General Conditions Costs shall include a detailed breakdown of itemized costs separate but similar to the Schedule of Values.

### 3. Schedule of Values

Provide a summary spreadsheet with the estimated cost organized by subagreement categories, contingencies, general conditions, taxes, bonds, insurances, and construction fee. Additionally, provide supporting documents for the spreadsheet in an organized manner that correlates with the schedule of values. The backup information shall consist of the most current version of the Cost Model utilized to develop the GMP.

### 4. List of Plans and Specifications

Provide a list of plans and specifications with latest issuance date including all addenda used in preparation of the GMP proposal. This document must be date stamped and signed by CMAR.

### 5. List of Clarifications and Assumptions

Provide a list of the clarifications and assumptions made by CMAR in the preparation of the GMP proposal. This information is intended to supplement the information contained within other documents submitted to the Owner.

### 6. Project Master Schedule

Provide a Critical Path Method (CPM) diagram and other information to identify the Project Master Schedule.

**(Do not acquire bond or insurance until notified by the Owner's Project Representative.)**

**NOTE:** Keep the submittal package as simple as possible all on 8 ½ x 11 sheets. Color or shading shall be kept to a minimum. If used, make sure the color or shading shall not affect the reproduction of the submittal. For questions regarding the submittal requirements, please contact Patrick Brown, Purchasing Director (pbrown@flagstaffaz.gov).

# CITY OF FLAGSTAFF SAMPLE GMP SUMMARY TABLE

Contractor can choose to fill in table using percentages or flat rates.

A	B	D	E
ITEM DESCRIPTION			TOTAL
1	<b>DIRECT COSTS</b>		
2	COST OF THE WORK		\$ 8,000,000.00
3	<b>INDIRECT COSTS</b>		
4	GENERAL CONDITIONS COSTS (GCs) (Percentage of Cost of the Work)	10.00%	\$ 800,000.00
5	<b>SUBTOTAL #1 - Cost of the work + GCs</b>		<b>\$ 8,800,000.00</b>
6	CONSTRUCTION FEE (Fee) (Percentage of Subtotal #1)	5.68%	\$ 500,000.00
7	<b>SUBTOTAL #2 - Cost of the work + GCs + Fee</b>		<b>\$ 9,300,000.00</b>
8	PAYMENT & PERFORMANCE BONDS (Bonds) (Percentage of Subtotal #2)	1.08%	\$ 100,000.00
9	<b>SUBTOTAL #3 - Cost of the work + GCs + Fee + Bonds</b>		<b>\$ 9,400,000.00</b>
10	INSURANCE (Percentage of Subtotal #3)	0.85%	\$ 80,000.00
11	<b>SUBTOTAL #4 - Cost of the work + GCs + Fee + Bonds + Insurance</b>		<b>\$ 9,480,000.00</b>
12	SALES TAX (Percentage of Subtotal #4, Percentage = 65% x City of Flagstaff current tax rate)	5.82%	\$ 551,560.62
13			
14	CMAR CONTINGENCY (Percentage of Cost of the Work)	1.25%	\$ 100,000.00
15	<b>GMP</b>		<b>\$ 10,131,560.62</b>
16			
17	OWNER'S CONTINGENCY (Percentage of Cost of the Work)	2.50%	\$ 200,000.00
18	<b>CONTRACT PRICE</b>		<b>\$ 10,331,560.62</b>

Total Cost of the Schedule of Values

Percentage based on Cost of the Work (E5/E3)

**Sum of E3 and E5**

Percentage based on Subtotal #1 (E7/E6)

**Sum of E6 and E7**

Percentage based on Subtotal #2 (E9/E8)

**Sum of E8 and E9**

Percentage based on Subtotal #3 (E11/E10)

**Sum of E10 and E11**

Subtotal #4 multiplied by current tax rate x 0.65 (E12xD13)

Percentage based on Cost of the Work (E15/E3)

**Sum of E12 through E15**

Percentage based on Cost of the Work (E18/E3)

**Sum of E17 and E18**

Last Revised 5/9/2018

## EXHIBIT D – MONTHLY ANTICIPATED ADVERSE WEATHER DAYS

CMAR will be entitled to a Contract Time extension if the actual adverse weather Days experienced during the Work exceed the anticipated adverse weather Days shown in Table 108.7.

**TABLE 108.7 – MONTHLY ANTICIPATED ADVERSE WEATHER CALENDAR DAYS**

MONTH	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
MONTHLY ANTICIPATED ADVERSE WEATHER CALENDAR DAYS	<b>7 days</b>	<b>7 days</b>	<b>8 days</b>	<b>6 days</b>	<b>4 days</b>	<b>3 days</b>
AVERAGE MONTHLY PRECIPITATION	1.98"	1.96"	2.05"	1.84"	0.68"	0.51"
MONTHLY DAILY HIGH TEMPERATURE ≤32° F	5 days	3 days	2 days	0 days	0 days	0 days
MONTH	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
MONTHLY ANTICIPATED ADVERSE WEATHER CALENDAR DAYS	<b>12 day</b>	<b>11 days</b>	<b>7 days</b>	<b>5 days</b>	<b>5 days</b>	<b>6 days</b>
AVERAGE MONTHLY PRECIPITATION	2.78"	2.68"	1.82"	1.52"	1.49"	1.90"
MONTHLY DAILY HIGH TEMPERATURE ≤ 32° F	0 days	0 days	0 days	0 days	1 day	5 days

The above schedule of anticipated adverse weather days establishes the base line for the project’s monthly weather impacts, based on historical records, as recorded by the National Weather Service at Pulliam Airport, for precipitation in excess of 0.01 inch and daily high temperatures below 32° Fahrenheit.

**EXHIBIT E – GRANT PROVISIONS**  
(ATTACHED)

June 26, 2024

Mr. Adam Miele, P.E.  
Airport Programs Manager  
City of Flagstaff  
6200 S. Pulliam Dr. Ste 204  
Flagstaff, AZ 86005

**RE: Construction Manager at Risk (CMAR)-City of Flagstaff Pulliam Airport Snow Removal Equipment Building  
Design Phase Services Lump Sum Proposal**  
Loven-Fann JV Project # 23-329-01

Dear Mr. Miele,

The following is Loven-Fann Joint Venture's Lump Sum proposal for Design Phase Services for the City of Flagstaff's Pulliam Airport Snow Removal Equipment Building (SREB-Project # 01-23001). This proposal is based upon RSOQ Number: 2024-114, dated April 2024.

**Project Understanding:**

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The City of Flagstaff intends to use Construction Manager at Risk (CMAR) delivery method for this project. Design phase services will be reimbursed as lump sum. This proposal is based upon the attached preconstruction schedule "Attachment B" coordinated with Owner and Architect of Record.

The project is located at 6200 S. Pulliam Dr. in Flagstaff, AZ. Scope of work generally includes reviewing and providing input on design, plans, specifications, schedules, quantities, procurement, cost estimates, subsurface utility investigations, sequencing of the project, and constructability in coordination with the City of Flagstaff and APMI, Inc to prepare comprehensive construction documents and develop Guaranteed Maximum Prices (GMPs) for the project.

Construction includes a 25,000SF Snow Removal Equipment Building, providing the airport with readily available and accessible equipment. The building will be accompanied by site and infrastructure improvements to serve the building.

**Scope of Services:**

---

**Program Evaluation**

1. Review current project documents, requirements, goals schedule, and funding.

**Project Site Observation and Analysis**

1. Conduct project site visit to review existing conditions.
2. Field locate subsurface utilities within project boundaries. Locations will be documented by a surveyor.

- a. **Deliverable:** Provide PDF document noting locations, material types, depths and sizing of existing utilities within project limits for incorporation into the plans by others and shared with owner and Architect of Record.
3. Provide soil analysis (completed by Speedie Associates, current Geotech contracted by Architect of Record) of client imported fill material (approximately 15,000CY). One mobilization is included to current location of stored materials. Fill material was previously imported by others. Assumes material to be tested is mixed and homogeneous.
  - a. **Deliverable:** Report of test results.
4. Water flow test at existing hydrant with fully functional valve per NFPA 25 and 291. Subject to applicable permits and proper notification to Authority having jurisdiction.
  - a. **Deliverable:** Documentation with final report of NFPA flow rates.

### **Project Meetings**

1. Participate in project kickoff meeting and provide meeting minutes to AE and Client.
2. Participate in weekly design meetings and compile meetings minutes with the City of Flagstaff and the design team.
3. Includes one meeting per GMP with the Airport Commission and City Council.
4. Project design meeting to be revised to bi-weekly after December 2024.
5. Loven-Fann to provide design meetings to Client and Architect of Record for AE to distribute.
  - a. **Deliverable:** Coordination of meeting agendas, meeting materials, and meeting minutes.

### **Project Schedule**

1. Develop the project master schedule including preconstruction and construction durations. Review and coordinate the master schedule with the City of Flagstaff, APMI, and stakeholders. The schedule will include design activities, budget and GMP, submittals, procurement, permitting, construction, commissioning, and post-construction activities. Once approved, the preconstruction schedule will be managed, updated, and distributed weekly. The master schedule will be confirmed and included with progress budgets and GMP deliverables.
  - a. **Deliverable:** Master project schedule, weekly distribution of preconstruction schedule, and confirmation of master schedule with progress budgets and GMPs.

### **Budget**

1. **Cost Model:**
  - a. Provide cost model based on Architect 60% milestone plans and specifications. Cost model will utilize quantities, and unit costs with selective input from trade partners.
    - i. **Deliverable:** Cost model including budget narrative and delineation of costs.
2. **Cost Estimate**
  - a. Provide cost estimate based on Architect 90% milestone plans and specifications. The cost estimate will utilize trade partner, supplier, and vendor input with selective quantity and unit cost.
    - i. **Deliverable:** Cost estimate including budget narrative and delineation of costs.

### Construction GMP(s)

1. **Construction GMP 1- Early Sitework Civil and Early Procurement (Electrical and PEMB/Load Bearing Masonry)**
  - a. Upon approval of the 60% plans and cost model, provide GMP 1. GMP 1 will be based upon 100% final civil plans and 60% Architectural and MEP plans. GMP 1 will include site improvements, electrical and pre-engineered metal building, including supplier and subcontractor solicitation and qualification. GMP will be inclusive of overall project cost with subsequent funding breakdowns.
    - i. **Deliverable:** Construction GMP 1
2. **Construction GMP 2- Final Civil and Building**
  - a. Upon approval of the final construction documents, provide GMP 2. GMP 2 will include the remaining construction scope and costs not included in GMP 1, including supplier and subcontractor solicitation and qualification. Includes budget verification incorporating comments received during the permitting process. GMP will be inclusive of overall project cost with subsequent funding breakdowns.
    - i. **Deliverable:** Construction GMP 2

### Choosing by Advantage Analysis (CBA)

1. Coordinate, review, and finalize building type analysis. Anticipated options include pre-engineered metal building (PEMB) or a combination of structural steel and masonry. The analysis and decision will utilize the Choosing by Analysis process.
  - a. **Deliverable:** Documentation of the CBA process and final decision.

### Offsite Utility Coordination

1. Support designer and owner with coordination of offsite utility companies. Utility fees are not included.
  - a. **Deliverable:** Documentation of coordination meetings.

### Design Document Review

1. Provide review of design documents at 60%, 90%, and 100% design review. Includes constructability analysis, biddability review, and alternative systems strategies. Provide review and input on concrete mix design and treatment to be used in the vehicle bays considering deicing chemicals and runoff.
  - a. **Deliverable:** Mark up design documents provided to the City of Flagstaff and design team.

### Procurement Plan

1. Provide a procurement plan coordinated with the construction schedule. Identify material long-lead times and prepurchase strategies coordinated with construction schedule. Provide analysis of alternative products for time or cost impacts.
  - a. **Deliverable:** Procurement schedule within the master schedule identifying milestones and lead times for equipment coordinated with the project schedule.

### Construction Management Plan

1. Includes development of site logistics plan, site-specific safety plan, and traffic control and haul route plan.
  - a. **Deliverable:** Site logistics plan, site-specific safety plan, and traffic control plan and haul route plan.

### Permit Support

1. Coordinate with the City of Flagstaff and provide support with the permitting process, including SWPPP plan and permit.
  - a. **Deliverable:** SWPPP plan and permit.

### Insurance

1. Insurance indicated in the sample City of Flagstaff sample CMAR preconstruction agreement.

**Note:** Workers' compensation and auto will be provided in the name of Fann Contracting and Loven Contracting. All other insurance will be provided in the name of Loven-Fann Joint Venture.

  - a. **Deliverable:** Certificate of Insurance.

### Additional Services (TBD)

1. Additional services will be provided as requested and approved. Additional services will be reimbursed at the provided hourly rates or an agreed-upon lump sum.

### Reimbursables

1. An allowance for printing, outsourcing, or other reimbursable expenses.

### BIM Modeling

1. Utilize APMI Revit Model plans as the basis for the model to complete a three-dimensional clash detection plan and coordinate with trade partners on proposed building components. Modeling to begin at 90% design development with completion after procurement of major trades. BIM model will provide a comprehensive approach to coordinate design and construction to provide a more efficient process. As well as provide final as-built documentation to show building structure, radiant floor heating layout, equipment within the building, MEP infrastructure layout and overhead door requirements. This final deliverable will help to insure all items noted above properly adhere to the limits and coordinate all aspects within the building.
  - a. **Deliverable:** PDF Revit Model version 2022 to an LOD 350 level.

### REFERENCE DOCUMENTS:

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1. Attachment "A" Cost Detail
2. Attachment "B" Tentative Design Schedule
3. Attachment "C" Design Assist Labor Billing Rates

## Exclusions

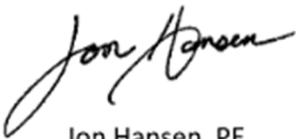
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1. Archeological and environmental services
2. City of Flagstaff sales tax, or bond not required or included for preconstruction services
3. Design/engineering- architectural, structural, civil, landscape, mechanical, plumbing, electric, FFE, geotechnical, environmental and survey
4. Lightning protection system evaluation and design, to be provided by architect and/or engineering consultants
5. Permit and utility fees associated with these design phased services.
6. Selection and specification of furnishings to be provided by others
7. Additional scope or services not included above
8. Major scope changes from currently presented project scope, requirements or submittal documents
9. Investigation services beyond the currently proposed
10. Additional consulting, public relations, or other third-party services not included above

Loven-Fann Joint Venture appreciates the opportunity to respectfully submit this Lump Sum proposal for design phase services, the value of these services are **as follows:**

- A. Basic Design Phase Services \$692,082.67
- B. Additional Design Phase Services \$ N/A
- C. Total Preconstruction Services Agreement Contract Price Not to Exceed **\$698,582.67**
- D. Reimbursable services included within budget \$6,500.00

Thank you,



Jon Hansen, PE  
Loven-Fann Joint-Venture

# LOVEN | FANN

## JOINT VENTURE

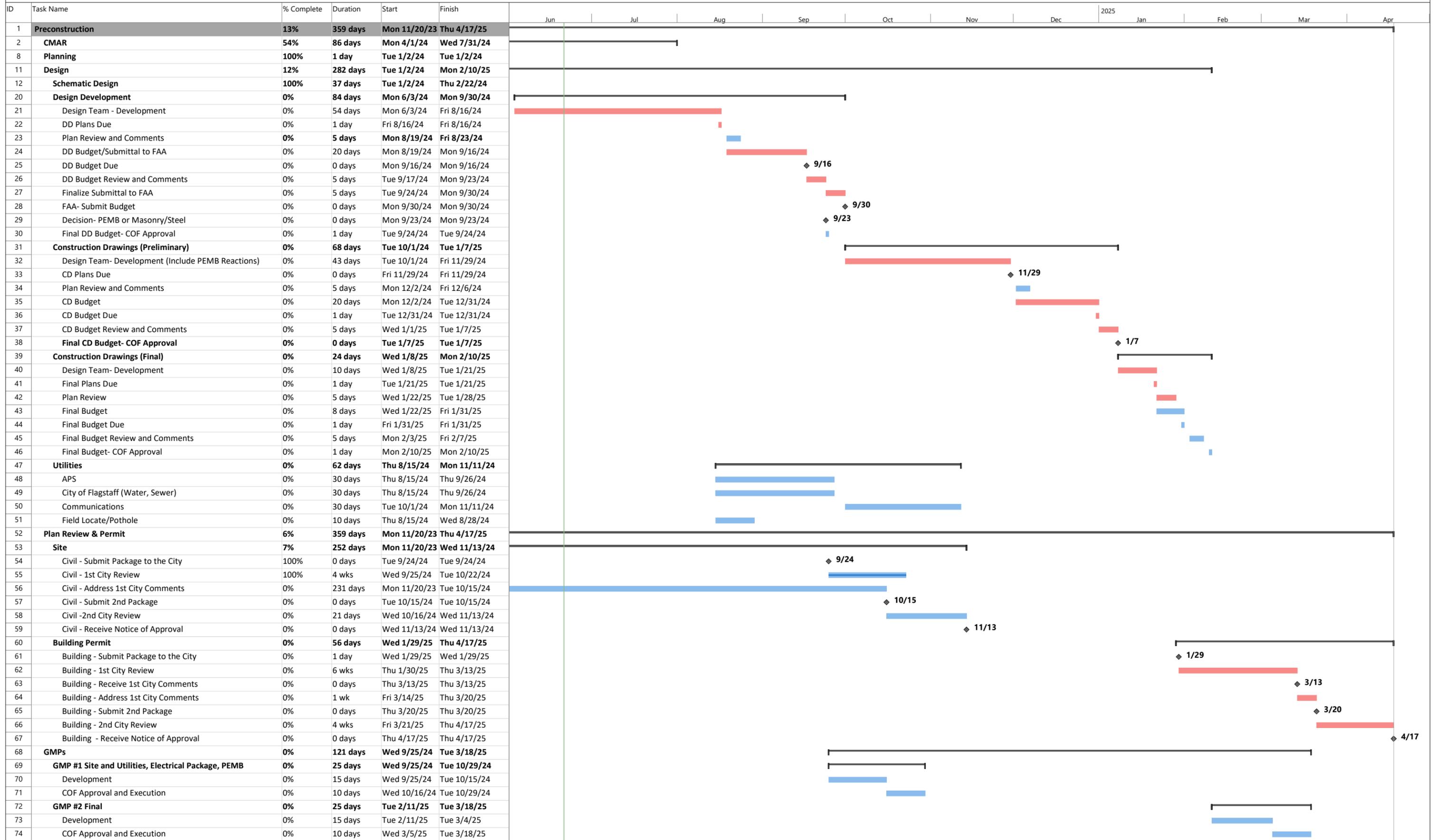
PROJECT NAME:	Snow Equipment Removal Building-CMAR
PROJECT NUMBER:	23-329-01
LAST UPDATED:	6.25.2024
OWNER(S):	City of Flagstaff

PHASE #	CATEGORY	CATEGORY DESCRIPTION	NOTES / SCOPE	BUDGET
<b>DIVISION 00-PRE-CONSTRUCTION</b>				
DIVISION PHASE CODE	CATEGORY DESCRIPTION		NOTES/SCOPE	BASE BUDGET
002300	Architectural and Engineering		By CoF	\$ -
002304	BIM			\$ 33,000.00
002401	Project Executive			\$ 128,128.00
002402	Senior Project Manager			\$ 31,270.00
002403	Project Manager			\$ 69,984.00
002404	Director of Preconstruction			\$ 106,250.00
002405	Estimator/Takeoff Technician			\$ 38,160.00
002406	Superintendent			\$ 14,388.00
002408	Civil Estimator			\$ 92,928.00
002409	Civil Superintendent			\$ 22,272.00
002410	Construction Accountant			\$ 3,780.00
002411	BIM Project Manager			\$ 25,200.00
002500	Soil Analysis		Proctor and Plasticity	\$ 5,000.00
003121	Survey Information		Utility Depth Locations	\$ 2,249.00
003126	Concrete Admixture Design Assist			\$ 20,000.00
003132	Trade Partner Design Analysis and Input			\$ 23,500.00
003133	Water Flow Test			\$ 500.00
003134	Potholing and Utility Locating			\$ 13,280.00
<b>00-Pre-Construction Total</b>				<b>\$ 629,889.00</b>

<b>ESTIMATE SUMMARY</b>			
			BASE BUDGET
<b>Subtotal</b>			<b>\$ 629,889.00</b>
<b>Insurance</b>	<b>1.50%</b>		<b>\$ 9,448.34</b>
<b>Construction Fee</b>	<b>8.25%</b>		<b>\$ 52,745.33</b>
<b>Reimbursibles</b>			<b>\$ 6,500.00</b>
<b>Sales Tax</b>	<b>0.00%</b>		<b>\$ -</b>
<b>Total Estimate</b>			<b>\$ 698,582.67</b>

# City of Flagstaff Pulliam Airport Snow Removal Equipment Building

**\*6.21.24 PRELIMINARY FOR REVIEW\*\***



**Loven-Fann Joint Venture**

**Design Phase Billing Rates 6.21.2024**

**Confidential**

<u>Classification</u>	<u>Hourly Rate</u>
Project Executive	\$143.00
Senior Project Manager	\$118.00
Project Manager	\$108.00
Director of Preconstruction	\$125.00
Estimator/Takeoff Technician	\$106.00
Civil Estimator	\$128.00
Superintendent	\$109.00
Civil Superintendent	\$128.00
Potholing Crew	\$332.00
Contract Admin	\$56.00
Construction Accountant	\$105.00



## **GRANT PROVISIONS**

**Sponsor:** City of Flagstaff

**Funding Agency:** U.S. Department of  
Transportation, Federal Aviation  
Administration



# **Contract Provision Guidelines for Obligated Sponsors and Airport Improvement Program Projects**

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## Record of Changes

No.	Date	Item	Change
1	1/29/2016	Entire Document	Re-structured document to enhance user understanding of use and applicability; added suggested provisions for “Termination for Cause”, “Recovered Materials”, “Seismic Safety”.
2	6/10/2016	Table 1	Distracted Driving: Updated “Dollar Threshold” to \$3,500 to reflect current micro-purchase threshold.
3	6/10/2016	A2, Affirmative Action	Update the reference to the Department of Labor online document to be “Participation Goals for Minority and Females”
4	6/10/2016	A12, Disadvantaged Business Enterprise	A12.3: Changed Title to “Required Provisions” A12.3.1: Corrected starting timeframe for submitting written confirmation from “Owner Notice of Award” to “bid opening” A12.3.1: Provided two sets of last paragraphs to reflect change (7 days to 5 days) that occurs on December 31, 2016. A12.3.2: Moved Race/Gender Neutral language up and renamed heading to reflect text is solicitation language. A12.3.3: Moved and renamed contract clause information and clarified it is for prime contract covered by a DBE program.
5	12/12/2017	Cover	Change title of document for clarity
6	12/12/2017	1. Purpose of this Document	Added clarifying text addressing purpose and limitations of this guidance. 1.7-1.9: Added definitions of contract, applicant, bid

No.	Date	Item	Change
7	12/12/2017	2. Sponsor requirements	Added clarifying text addressing sponsor responsibilities.
8	12/12/2017	3. Typical Procurement Steps	Added clarifying text for typical procurement process steps.
9	12/12/2017	Table 1 – Applicability Matrix	Re-arranged table in alphabetic order. Added “Solicitation” column to address solicitation provisions Item I, Seismic Safety: Added Limited Application Added note on Airport Concessions Disadvantaged Business Enterprises
10	12/12/2017	All Clauses	Clarifying revisions made to applicability section.
11	12/12/2017	A5, Civil Rights - General	Rephrased General Civil Rights Provision to simplify language and to clarify duration of obligation for tenant/concessionaire/lessee
12	12/12/2017	A6.3.1 Civil Rights – Solicitations	Added sponsor must select either DBE or ACDBE
12	12/12/2017	A12, Disadvantaged Business Enterprise	The deadline to submit DBE confirmation of participation is now 5 days after bid opening or as a matter of bid responsiveness.  Updated DBE contract assurance (12.3.3) to match language of 49 CFR § 26.13
13	12/12/2017	A24, Tax Delinquency and Felony Conviction	New certification addressing contractor tax delinquency and felony conviction.
14	6/19/2018	6.2.1, Applicability of Title VI Solicitation Notice	For Title VI Clauses for Compliance with Nondiscrimination Requirements, change second sentence in second column to changed “are already subject to nondiscrimination requirements” to “are <b>not</b> already subject to nondiscrimination requirements”.
15	6/19/2018	A6.4.1, Title VI Clauses for Compliance with Nondiscrimination Requirements	In second item, changed “are already subject to nondiscrimination requirements” to “are <b>not</b> already subject to nondiscrimination requirements”.

# CONTRACT GUIDANCE

## 1. Purpose of this Document

- 1) The purpose of this document is to establish a convenient resource for Sponsors that consolidates all possible provisions and clauses into one document that includes an applicability matrix. This document itself does not create, revise or delete requirements for participation in the Airport Improvement Program. The source of requirements addressed within this document are identified within the section for each individual clause.
- 2) Federal laws and regulations require that an sponsor (a recipient of federal assistance) include specific clauses in certain contracts, solicitations, or specifications regardless of whether or not the project is federally funded.
- 3) The term **sponsor** is used in this document to mean either an obligated sponsor on a project that is not federally funded, or a sponsor on an AIP funded project.
- 4) The term **Owner** is generally used in the solicitation or contract clauses because of its common use in public contracts.
- 5) An Owner becomes an obligated sponsor upon acceptance of the Airport Improvement Program (AIP) grant assurances associated with current or prior AIP grant funded projects.
- 6) For purposes of determining requirements for contract provisions, the term **contract** includes subcontracts and supplier contracts such as purchase orders.
- 7) For purpose of remaining compliant with its obligations, a sponsor must incorporate applicable contract provisions in all its procurements and contract documents. Unless otherwise stated, these provisions flow down to subcontracts and sub-tier agreements.
- 8) The term **contractor** is understood to mean a contractor, subcontractor, or consultant; and means one who participates, through a contract or subcontract (at any tier).
- 9) The term **bid** is understood to mean a bid, an offer, or a proposal.
- 10) **Applicant:**
  - a. For the Equal Employment Opportunity (EEO) clause, the term **applicant** means an applicant for employment (whether or not the phrase, *for employment*, follows the word applicant or applicants).
  - b. For all other clauses, the term **applicant** means a bidder, offeror, or proposer for a contract.

## 2. Sponsor Requirements

In general, the sponsor must take the following actions in order to remain consistent with its obligations:

- 1) Include in its procurements the provisions that are applicable to its project.

- 2) Not incorporate the entire contract provisions guidelines in its solicitation or contract documents, whether by reference or by inclusion in whole. Incorporation of this entire guidance document creates potential for ambiguous interpretation and may lead to improper application that unnecessarily increases price. A sponsor that fails to properly incorporate applicable contract clauses may place themselves at risk for audit findings or denial of Federal funding.
- 3) Incorporate applicable contract provisions using mandatory language as required. The subheading entitled *Applicability* advises whether a particular clause or provision has mandatory language that a sponsor must use.
  - (a) Mandatory Language - Whenever a clause or provision has mandatory text, the sponsor must incorporate the text of the provision **without change**, except where specific adaptive input is necessary (e.g. such as the sponsor's name).
  - (b) No Mandatory Language Provided - For provisions without mandatory language, this guidance provides model language acceptable to the FAA. Some sponsors may already have standard procurement language that is equivalent to those federal provisions. In these cases, sponsors may use their existing standard procurement provision language provided the text meets the intent and purpose of the Federal law or regulation.
- 4) Require the contractor (including all subcontractors) to insert these contract provisions in each lower tier contract (e.g. subcontract or sub-agreement).
- 5) Require the contractor (including all subcontractors) to incorporate the applicable requirements of these contract provisions by reference for work done under any purchase orders, rental agreements and other agreements for supplies or services.
- 6) Require that the prime contractor be responsible for compliance with these contract provisions by any subcontractor, lower-tier subcontractor or service provider.
- 7) Verify that any required local or State provision does not conflict with or alter a Federal law or regulation.

### **3. Typical Procurement Steps**

The usual procurement steps in a project are:

- 1) Solicitation, Request for Bids or Request for Proposals – This is also called the Advertisement or Notice to Bidders.
- 2) Bidding or Accepting Proposals – In this stage, the bidders receive a complete set of the procurement documents, also known as the project manual. The project manual will typically include a copy of the solicitation, instructions-to-bidders, bid forms, certifications and representations, general provisions, contract conditions, copy of contract, project drawings, technical specifications and related project documents.
- 3) Bid/Proposal Evaluation – Period when Sponsor tabulates and reviews all proposals for bid responsiveness and bidder responsibility.
- 4) Award – Point when the Sponsor formally awards the contract to the successful bidder.

- 5) Execution of Contract – Point at which the Sponsor formally enters into a legally binding agreement to perform services or provide goods.

#### **4. Applicability Matrix for Contract Provisions**

[Table 1](#) summarizes the applicability of contract provisions based upon the type of contract or agreement. The dollar threshold represents the value at which, when equal to or exceeded, the sponsor must incorporate the provision in the contract or agreement.

Supplemental information addressing applicability and use for each provision is located in Appendix A. Appendix A and the Matrix include notes indicating when the sponsor may incorporate references in the **solicitation** in lieu of including the entire text.

## Meaning of cell values

- Info – Sponsor has discretion on whether to include clause in its contracts.
- Limited – Provision with limited applicability depending on circumstances of the procurement.
- n/a – Provision that is not applicable for that procurement type.
- NIS – Provision that does not need to be included or referenced in the solicitation document
- REF – Provision to be incorporated into the solicitation by reference.
- REQD - Provision the sponsor must incorporate into procurement documents.

**Table 1 – Applicability of Provisions**

Provisions/Clauses	Dollar Threshold	Solicitation	Professional Services	Construction	Equipment	Property (Land)	Non-AIP Contracts
<a href="#">Access to Records and Reports</a>	\$ 0	NIS	REQD	REQD	REQD	REQD	n/a
<a href="#">Affirmative Action Requirement</a>	\$10,000	REQD	Limited	REQD	Limited	Limited	n/a
<a href="#">Breach of Contract</a>	\$150,000	NIS	REQD	REQD	REQD	REQD	n/a
<a href="#">Buy American Preferences</a>	\$ 0	REF	Limited	REQD	REQD	Limited	n/a
(1) <a href="#">Buy American Statement</a>	\$ 0	NIS	Limited	REQD	REQD	Limited	n/a
(2) <a href="#">BA – Total Facility</a>	\$ 0	NIS	Limited	REQD	REQD	Limited	n/a
(3) <a href="#">B.A. – Manufactured Product</a>	\$ 0	NIS	Limited	REQD	REQD	Limited	n/a
<a href="#">Civil Rights – General</a>	\$ 0	NIS	REQD	REQD	REQD	REQD	REQD
<a href="#">Civil Rights - Title VI Assurances</a>	\$ 0	REF	REQD	REQD	REQD	REQD	REQD
(1) <a href="#">Notice - Solicitation</a>	\$ 0	REQD	REQD	REQD	REQD	REQD	REQD
(2) <a href="#">Clause - Contracts</a>	\$ 0	NIS	REQD	REQD	REQD	REQD	REQD
(3) <a href="#">Clause – Transfer of U.S. Property</a>	\$ 0	NIS	n/a	n/a	n/a	Limited	REQD
(4) <a href="#">Clause – Transfer of Real Property</a>	\$ 0	NIS	n/a	n/a	n/a	REQD	REQD
(5) <a href="#">Clause - Construct/Use/Access to Real Property</a>	\$ 0	NIS	n/a	n/a	n/a	REQD	REQD
(6) <a href="#">List – Pertinent Authorities</a>	\$0	NIS	REQD	REQD	REQD	REQD	REQD
<a href="#">Clean Air/Water Pollution Control</a>	\$150,000	NIS	REQD	REQD	REQD	REQD	n/a
<a href="#">Contract Work Hours and Safety Standards</a>	\$100,000	NIS	Limited	REQD	Limited	Limited	n/a
<a href="#">Copeland Anti-Kickback</a>	\$ 2,000	NIS	Limited	REQD	Limited	Limited	n/a
<a href="#">Davis Bacon Requirements</a>	\$ 2,000	REF	Limited	REQD	Limited	Limited	n/a
<a href="#">Debarment and Suspension</a>	\$25,000	REF	REQD	REQD	REQD	Limited	n/a
<a href="#">Disadvantaged Business Enterprise</a>	\$ 0	REF	REQD	REQD	REQD	REQD	n/a
<a href="#">Distracted Driving</a>	\$3,500	NIS	REQD	REQD	REQD	REQD	n/a
<a href="#">Energy Conservation Requirements</a>	\$ 0	NIS	REQD	REQD	REQD	REQD	n/a
<a href="#">Equal Employment Opportunity</a>	\$10,000	NIS	Limited	REQD	Limited	Limited	n/a
(1) <a href="#">EEO Contract Clause</a>	\$10,000	NIS	Limited	REQD	Limited	Limited	n/a
(2) <a href="#">EEO Specification</a>	\$10,000	NIS	Limited	REQD	Limited	Limited	n/a
<a href="#">Federal Fair Labor Standards Act</a>	\$ 0	NIS	REQD	REQD	REQD	REQD	Info
<a href="#">Foreign Trade Restriction</a>	\$ 0	REF	REQD	REQD	REQD	REQD	n/a
<a href="#">Lobbying Federal Employees</a>	\$ 100,000	REF	REQD	REQD	REQD	REQD	n/a
<a href="#">Occupational Safety and Health Act</a>	\$ 0	NIS	REQD	REQD	REQD	REQD	Info
<a href="#">Prohibition of Segregated Facilities</a>	\$10,000	NIS	Limited	REQD	Limited	Limited	n/a
<a href="#">Recovered Materials</a>	\$10,000	REF	Limited	REQD	REQD	Limited	n/a
<a href="#">Rights to Inventions</a>	\$ 0	NIS	Limited	Limited	Limited	n/a	n/a
<a href="#">Seismic Safety</a>	\$ 0	NIS	Limited	Limited	Limited	n/a	n/a
<a href="#">Tax Delinquency and Felony Conviction</a>	\$ 0	NIS	REQD	REQD	REQD	REQD	n/a
<a href="#">Termination of Contract</a>	\$10,000	NIS	REQD	REQD	REQD	REQD	n/a
<a href="#">Veteran’s Preference</a>	\$ 0	NIS	REQD	REQD	REQD	REQD	n/a

**Airport Concessions Disadvantage Business Enterprise (ACDBE) Notes:**

1. Language relative to solicitation for ACDBEs does not need to be included in AIP funded solicitations, since in no case are concessions activities funded with federal funds.
2. Airport sponsors must include the appropriate Title VI language in their solicitation notices when they seek proposals for concessions.

# **APPENDIX A – CONTRACT PROVISIONS**

## **A1 ACCESS TO RECORDS AND REPORTS**

### **A1.1 SOURCE**

2 CFR § 200.333

2 CFR § 200.336

FAA Order 5100.38

### **A1.2 APPLICABILITY**

2 CFR § 200.333 requires a sponsor to retain records pertinent to a Federal award for a period of three years from submission of final closure documents. 2 CFR § 200.336 establishes that sponsors must provide Federal entities the right to access records pertinent to the Federal award. FAA policy extends these requirements to the sponsor's contracts and subcontracts of AIP funded projects.

**Contract Types** – The sponsor must include this provision in all contracts and subcontracts of AIP funded projects.

**Use of Provision** – No mandatory language provided. The following language is acceptable to the FAA with meeting the intent of this requirement. If the sponsor prefers to use different language, the sponsor's language must fully satisfy the requirements of §§ 200.333 and 200.336.

### **A1.3 CONTRACT CLAUSE**

#### **ACCESS TO RECORDS AND REPORTS**

The Contractor must maintain an acceptable cost accounting system. The Contractor agrees to provide the Owner, the Federal Aviation Administration and the Comptroller General of the United States or any of their duly authorized representatives access to any books, documents, papers and records of the Contractor which are directly pertinent to the specific contract for the purpose of making audit, examination, excerpts and transcriptions. The Contractor agrees to maintain all books, records and reports required under this contract for a period of not less than three years after final payment is made and all pending matters are closed.

## **A2 AFFIRMATIVE ACTION REQUIREMENT**

### **A2.1 SOURCE**

41 CFR part 60-4

Executive Order 11246

### **A2.2 APPLICABILITY**

**Minority Participation.** Sponsors are required to set goals for minority participation in AIP funded projects exceeding \$10,000. The goals for minority participation derive from Economic Area (EA) and Standard Metropolitan Statistical Area (SMSA) as established in Volume 45 of the Federal Register dated 10/3/80. Page 65984 contains a table of all EAs and SMSAs and the associated minority participation goals.

To find the goals for minority participation, a sponsor must either refer to the Federal Register Notice or to the Department of Labor online document, "[Participation Goals for Minorities and Females](#)". EAs and SMSAs span state boundaries. A sponsor may have to refer to entries for adjacent states in order to locate the goal for the project location.

**Female Participation.** Executive Order 11246 has set a goal of 6.9% nationally for female participation for all construction projects. This value remains constant for all counties and states.

#### **Contract Types –**

*Construction* – The sponsor must incorporate this notice in all solicitations for bids or requests for proposals for AIP funded construction work contracts and subcontracts that exceed \$10,000. Construction work means construction, rehabilitation, alteration, conversion, extension, demolition or repair of buildings, highways or other changes or improvements to real property, including facilities providing utility services. The term also includes the supervision, inspection and other onsite functions incidental to the actual construction.

*Equipment* – The sponsor must incorporate this notice in any equipment project exceeding \$10,000 that involves installation of equipment onsite (e.g. electrical vault equipment). This provision does not apply to equipment acquisition projects where the manufacture of the equipment takes place offsite at a manufacturer's plant (e.g. firefighting and snow removal vehicles).

*Professional Services* – The sponsor must incorporate this notice in any professional service agreement if the professional services agreement includes tasks that meet the definition of construction work [as defined by the U.S. Department of Labor (DOL)] and exceeds \$10,000. Examples include installation of monitoring systems (e.g. noise, environmental, etc.).

*Property/Land* – The sponsor must incorporate this notice in any agreement associated with land acquisition if the agreement includes construction work (defined above) that exceeds \$10,000. Examples include demolition of structures or installation of boundary fencing.

**Use of Provision – MANDATORY TEXT.** The sponsor must:

- (a) Incorporate the text of this provision in its solicitations without modification.
- (b) Incorporate the applicable minority participation goal and the covered area by geographic name.
- (c) Not simply insert a reference to the 1980 Federal Register Notice.

### **A2.3 SOLICITATION CLAUSE**

#### **NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION to ENSURE EQUAL EMPLOYMENT OPPORTUNITY**

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

#### **Timetables**

Goals for minority participation for each trade:	N/A
Goals for female participation in each trade:	6.9%

These goals are applicable to all of the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a) and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs (OFCCP) within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

4. As used in this notice and in the contract resulting from this solicitation, the “covered area” is the City of Flagstaff.

## **A3 BREACH OF CONTRACT TERMS**

### **A3.1 SOURCE**

2 CFR § 200 Appendix II(A)

### **A3.2 APPLICABILITY**

This provision requires sponsors to incorporate administrative, contractual or legal remedies if contractor violate or breach contract terms. The sponsor must also include appropriate sanctions and penalties.

**Contract Types** – This provision is required for all contracts that exceed the simplified acquisition threshold as stated in 2 CFR Part 200, Appendix II (A). This threshold is occasionally adjusted for inflation and is now equal to \$150,000.

**Use of Provision** – No mandatory language provided. The following language is acceptable to the FAA as meeting the intent of this requirement. If the sponsor uses different language, the sponsor’s language must fully satisfy the requirements of part 200. Select either “contractor” or “consultant” as applicable.

### **A3.3 CONTRACT CLAUSE**

#### **BREACH OF CONTRACT TERMS**

Any violation or breach of terms of this contract on the part of the *Contractor* or its subcontractors may result in the suspension or termination of this contract or such other action that may be necessary to enforce the rights of the parties of this agreement.

Owner will provide *Contractor* written notice that describes the nature of the breach and corrective actions the *Contractor* must undertake in order to avoid termination of the contract. Owner reserves the right to withhold payments to Contractor until such time the Contractor corrects the breach or the Owner elects to terminate the contract. The Owner’s notice will identify a specific date by which the *Contractor* must correct the breach. Owner may proceed with termination of the contract if the *Contractor* fails to correct the breach by the deadline indicated in the Owner’s notice.

The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder are in addition to, and not a limitation of, any duties, obligations, rights and remedies otherwise imposed or available by law.

## **A4 BUY AMERICAN PREFERENCE**

### **A4.1 SOURCE**

Title 49 USC § 50101

### **A4.2 APPLICABILITY**

The Buy American Preference requirement in 49 USC § 50101 requires that all steel and manufactured goods used on AIP projects be produced in the United States. The statute gives the FAA the ability to issue a waiver to a sponsor to use non-domestic material on an AIP funded project subject to meeting certain conditions. A sponsor may request that the FAA issue a waiver from the Buy American Preference requirements if the FAA finds that:

- 1) Applying the provision is not in the public interest;
- 2) The steel or manufactured goods are not available in sufficient quantity or quality in the United States;
- 3) The cost of components and subcomponents produced in the United States is more than 60 percent of the total components of a facility or equipment, and final assembly has taken place in the United States. Items that have an FAA standard specification item number (such as specific airport lighting equipment) are considered the equipment.
- 4) Applying this provision would increase the cost of the overall project by more than 25 percent.

**Timing of Waiver Requests.** Sponsors desiring a Type 1 or Type 2 waiver must submit their waiver requests *before* issuing a solicitation for bids or a request for proposal for a project.

The sponsor must submit Type 3 or Type 4 waiver requests *prior* to executing the contract. The FAA will generally not consider waiver requests after execution of the contract except where extraordinary and extenuating circumstances exist. The FAA cannot review waiver requests with incomplete information. Sponsors must assess the adequacy of the waiver request and associated information prior to forwarding a waiver request to the FAA for action.

**Buy American Conformance List.** The FAA Office of Airports maintains a listing of equipment that has received a nationwide waiver from the Buy American Preference requirements or that fully meet the Buy American requirements. The Nationwide Buy American Waiver List is available online at [www.faa.gov/airports/aip/buy\\_american/](http://www.faa.gov/airports/aip/buy_american/). Products listed on the Buy American Conformance list do not require additional submittal of domestic content information under a project specific Buy American Preference waiver.

**Facility Waiver Requests.** For construction of a facility, the sponsor may submit the waiver request after bid opening, but prior to contract execution. Examples of facility construction include terminal buildings, terminal renovation, and snow removal equipment buildings.

#### **Contract Types –**

*Construction and Equipment* – The sponsor must meet the Buy American Preference requirements of 49 USC § 50101 for all AIP funded projects that require steel or manufactured

goods. The Buy America requirements flow down from the sponsor to first tier contractors, who are responsible for ensuring that lower tier contractors and subcontractors are also in compliance.

Note: The Buy American Preference does not apply to equipment a contractor uses as a tool of its trade and which does not remain as part of the project.

*Professional Services* – Professional service agreements (PSAs) do not normally result in a deliverable that meets the definition of a manufactured product. However, the emergence of various project delivery methods has created situations where task deliverables under a PSA may include a manufactured product. If a PSA includes providing a manufactured good as a deliverable under the contract, the sponsor must include the Buy American Preference provision in the agreement.

*Property* – Most land transactions do not involve acquiring a manufactured product. However, under certain circumstances, a property acquisition project could result in the installation of a manufactured product. For example, the installation of property fencing, gates, doors and locks, etc. represent manufactured products acquired under an AIP funded land project that must comply with Buy American Preferences.

**Use of Provision** – No mandatory language provided. The following language is acceptable to the FAA and meets the intent of this requirement. If the sponsor uses different language, the sponsor’s revised language must fully comply with 49 USC § 50101.

There are two types of Buy American certifications. The sponsor must incorporate the appropriate “Certificate of Buy America Compliance” in the solicitation:

- Projects for a facility (buildings such as terminals, snow removal equipment (SRE) buildings, aircraft rescue and firefighting (ARFF) buildings, etc.) – Insert the Certificate of Compliance Based on Total Facility.
- Projects for non-facility development (non-building construction projects such as runway or roadway construction or equipment acquisition projects) – Insert the Certificate of Compliance Based on Equipment and Materials Used on the Project.

### **A4.3 SOLICITATION CLAUSE**

#### **A4.3.1 Buy American Preference Statement**

##### **BUY AMERICAN PREFERENCE**

The Contractor agrees to comply with 49 USC § 50101, which provides that Federal funds may not be obligated unless all steel and manufactured goods used in AIP funded projects are produced in the United States, unless the Federal Aviation Administration has issued a waiver for the product; the product is listed as an Excepted Article, Material Or Supply in Federal Acquisition Regulation subpart 25.108; or is included in the FAA Nationwide Buy American Waivers Issued list.

A bidder or offeror must complete and submit the Buy America certification included herein with their bid or offer. The Owner will reject as nonresponsive any bid or offer that does not include a completed Certificate of Buy American Compliance.

#### **A4.3.2 Certificate of Buy American Compliance – Total Facility**

##### **CERTIFICATE OF BUY AMERICAN COMPLIANCE FOR TOTAL FACILITY**

As a matter of bid responsiveness, the bidder or offeror must complete, sign, date, and submit this certification statement with its proposal. The bidder or offeror must indicate how it intends to comply with 49 USC § 50101 by selecting one of the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (i.e. not both) by inserting a checkmark (✓) or the letter “X”.

- Bidder or offeror hereby certifies that it will comply with 49 USC § 50101 by:
- a) Only installing steel and manufactured products produced in the United States; or
  - b) Installing manufactured products for which the Federal Aviation Administration (FAA) has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing; or
  - c) Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder or offeror agrees:

- To provide to the Owner evidence that documents the source and origin of the steel and manufactured product.
  - To faithfully comply with providing U.S. domestic products.
  - To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.
- The bidder or offeror hereby certifies it cannot comply with the 100 percent Buy American Preferences of 49 USC § 50101(a) but may qualify for either a Type 3 or Type 4 waiver under 49 USC § 50101(b). By selecting this certification statement, the apparent bidder or offeror with the apparent low bid agrees:
- a) To submit to the Owner within 15 calendar days of the bid opening, a formal waiver request and required documentation that supports the type of waiver being requested.
  - b) That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination that may result in rejection of the proposal.
  - c) To faithfully comply with providing U.S. domestic products at or above the approved U.S. domestic content percentage as approved by the FAA.
  - d) To furnish U.S. domestic product for any waiver request that the FAA rejects.
  - e) To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

#### **Required Documentation**

**Type 3 Waiver** – The cost of components and subcomponents produced in the United States is more than 60 percent of the cost of all components and subcomponents of the “facility”. The required documentation for a Type 3 waiver is:

- a) Listing of all manufactured products that are not comprised of 100 percent U.S. domestic content (excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety).
- b) Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly and installation at project location.
- c) Percentage of non-domestic component and subcomponent cost as compared to total “facility” component and subcomponent costs, excluding labor costs associated with final assembly and installation at project location.

**Type 4 Waiver** – Total cost of project using U.S. domestic source product exceeds the total project cost using non-domestic product by 25 percent. The required documentation for a Type 4 of waiver is:

- a) Detailed cost information for total project using U.S. domestic product
- b) Detailed cost information for total project using non-domestic product

**False Statements:** Per 49 USC § 47126, this certification concerns a matter within the jurisdiction of the Federal Aviation Administration and the making of a false, fictitious or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Company Name

\_\_\_\_\_

Title

### **A4.3.3 Certificate of Buy American Compliance – Manufactured Product**

#### **Certificate of Buy American Compliance for Manufactured Products**

As a matter of bid responsiveness, the bidder or offeror must complete, sign, date, and submit this certification statement with their proposal. The bidder or offeror must indicate how they intend to comply with 49 USC § 50101 by selecting one on the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (not both) by inserting a checkmark (✓) or the letter “X”.

- Bidder or offeror hereby certifies that it will comply with 49 USC § 50101 by:
- a) Only installing steel and manufactured products produced in the United States;
  - b) Installing manufactured products for which the Federal Aviation Administration (FAA) has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing; or
  - c) Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder or offeror agrees:

1. To provide to the Owner evidence that documents the source and origin of the steel and manufactured product.
  2. To faithfully comply with providing U.S. domestic product.
  3. To furnish U.S. domestic product for any waiver request that the FAA rejects
  4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.
- The bidder or offeror hereby certifies it cannot comply with the 100 percent Buy American Preferences of 49 USC § 50101(a) but may qualify for either a Type 3 or Type 4 waiver under 49 USC § 50101(b). By selecting this certification statement, the apparent bidder or offeror with the apparent low bid agrees:
1. To the submit to the Owner within 15 calendar days of the bid opening, a formal waiver request and required documentation that supports the type of waiver being requested.
  2. That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination may result in rejection of the proposal.
  3. To faithfully comply with providing U.S. domestic products at or above the approved U.S. domestic content percentage as approved by the FAA.
  4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

#### **Required Documentation**

**Type 3 Waiver** – The cost of the item components and subcomponents produced in the United States is more than 60 percent of the cost of all components and subcomponents of the “item”. The required documentation for a Type 3 waiver is:

- a) Listing of all product components and subcomponents that are not comprised of 100 percent U.S. domestic content (Excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety).
- b) Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly at place of manufacture.
- c) Percentage of non-domestic component and subcomponent cost as compared to total “item” component and subcomponent costs, excluding labor costs associated with final assembly at place of manufacture.

**Type 4 Waiver** – Total cost of project using U.S. domestic source product exceeds the total project cost using non-domestic product by 25 percent. The required documentation for a Type 4 of waiver is:

- a) Detailed cost information for total project using U.S. domestic product
- b) Detailed cost information for total project using non-domestic product

**False Statements:** Per 49 USC § 47126, this certification concerns a matter within the jurisdiction of the Federal Aviation Administration and the making of a false, fictitious or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Company Name

\_\_\_\_\_

Title

## **A5 CIVIL RIGHTS - GENERAL**

### **A5.1 SOURCE**

49 USC § 47123

### **A5.2 APPLICABILITY**

There are two separate civil rights provisions that apply to projects:

1. FAA General Civil Rights Provision and,
2. Title VI provisions, which are addressed in Appendix A6.

**Contract Types** – The General Civil Rights Provisions found in 49 USC § 47123, derived from the Airport and Airway Improvement Act of 1982, Section 520, apply to all sponsor contracts *regardless* of funding source.

**Use of Provision – MANDATORY TEXT.** There are two separate general civil rights provisions —one that is used for contracts, and one that is used for lease agreements or transfer agreements. The sponsor must incorporate the text of the appropriate provision without modification into the contract, or the lease or transfer agreement.

### **A5.3 CONTRACT CLAUSE (Use the Correct Clause for the Situation)**

#### **A5.3.1 Clause that is used for Contracts**

##### **GENERAL CIVIL RIGHTS PROVISIONS**

The Contractor agrees to comply with pertinent statutes, Executive Orders and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance.

This provision binds the Contractor and subcontractors from the bid solicitation period through the completion of the contract. This provision is in addition to that required by Title VI of the Civil Rights Act of 1964.

#### **A5.3.2 Clause that is used for Lease Agreements or Transfer Agreements**

##### **GENERAL CIVIL RIGHTS PROVISIONS**

The (tenant/concessionaire/lessee) agrees to comply with pertinent statutes, Executive Orders and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance. If the (tenant/concessionaire/lessee) transfers its obligation to another, the transferee is obligated in the same manner as the (tenant/concessionaire/lessor).

This provision obligates the (tenant/concessionaire/lessee) for the period during which the property is owned, used or possessed by the (tenant/concessionaire/lessee) and the airport remains obligated to the

Federal Aviation Administration. This provision is in addition to that required by Title VI of the Civil Rights Act of 1964.

## A6 CIVIL RIGHTS – TITLE VI ASSURANCE

### A6.1 SOURCE

49 USC § 47123

FAA Order 1400.11

### A6.2 APPLICABILITY

Title VI of the Civil Rights Act of 1964, as amended, (Title VI) prohibits discrimination on the grounds of race, color, or national origin under any program or activity receiving Federal financial assistance. Sponsors must include appropriate clauses from the Standard DOT Title VI Assurances in all contracts and solicitations.

The text of each individual clause comes from the U.S. Department of Transportation [Order DOT 1050.2](#), Standard Title VI Assurances and Nondiscrimination Provisions, effective April 24, 2013. These assurances require that the Recipient (the sponsor) insert the appropriate clauses in the form provided by the DOT. Where the clause refers to the applicable activity, project, or program, it means the AIP project.

The clauses are as follows:

#### A6.2.1 Applicability of Title VI Solicitation Notice

Contract Clause	The Sponsor must include the contract clause in:	Clause Text is Included in Paragraph
Title VI Solicitation Notice – <ul style="list-style-type: none"><li>Assurance 2 of the DOT Standard Title VI Assurances and Nondiscrimination Clauses</li><li>Assurance 30d of the Airport Sponsor Assurances</li></ul>	<ol style="list-style-type: none"><li>All AIP funded solicitations for bids, requests for proposals, or any work subject to Title VI regulations; and</li><li>All sponsor proposals for negotiated agreements <b>regardless of funding source.</b></li></ol>	A6.3.1
Title VI Clauses for Compliance with Nondiscrimination Requirements <ul style="list-style-type: none"><li>Assurance 3 of the DOT Standard Title VI Assurances and Nondiscrimination Clauses</li><li>Assurance 30e.1 of the Airport Sponsor Assurances</li></ul>	Every contract or agreement (unless the sponsor has determined, and the FAA concurs, that the contract or agreement is not subject to the Nondiscrimination Acts and Authorities)  It has been determined that service contracts with utility companies that are not already subject to nondiscrimination requirements must include this clause.	A6.4.1

Contract Clause	The Sponsor must include the contract clause in:	Clause Text is Included in Paragraph
<p>Title VI Required Clause for Property Interests Transferred from the United States</p> <ul style="list-style-type: none"> <li>Assurance 4 of the DOT Standard Title VI Assurances and Nondiscrimination Clauses</li> <li>Assurance 30e.3 of the Airport Sponsor Assurances</li> </ul>	<p>As a covenant running with the land, in any deed from the United States effecting or recording a transfer of real property, structures, use, or improvements thereon or interest therein to a sponsor.</p> <p>This is a rare occurrence and it will be the responsibility of the United States government to include the clause in the contract.</p>	A6.4.2
<p>Title VI Required Clause for Transfer of Real Property Acquired or Improved Under the Activity, Facility or Program –</p> <ul style="list-style-type: none"> <li>Assurance 5 of the DOT Standard Title VI Assurances and Nondiscrimination Clauses</li> <li>Assurance 30e.4a of the Airport Sponsor Assurances</li> </ul>	<p>As a covenant running with the land, in any future deeds, leases, licenses, permits, or similar instruments entered into by the sponsor with other parties for all transfers of real property acquired or improved under Airport Improvement Program</p> <p>This applies to agreements such as leases where a physical portion of the airport is transferred for use, for example a fuel farm, apron space, or a parking facility.</p>	A6.4.3
<p>Clause for Construction/Use/Access to Real Property Acquired Under the Activity, Facility or Program</p> <ul style="list-style-type: none"> <li>Assurance 6 of the DOT Standard Title VI Assurances and Nondiscrimination Clauses</li> <li>Assurance 30e.4b of the Airport Sponsor Assurances</li> </ul>	<p>In any future (deeds, leases, licenses, permits, or similar instruments) entered into by the sponsor with other parties for the construction or use of, or access to, space on, over, or under real property acquired or improved under Airport Improvement Program</p> <p>This applies to agreements such as leases of concession space in a terminal.</p>	A6.4.4
<p>Title VI List of Pertinent Nondiscrimination Acts and Authorities</p> <ul style="list-style-type: none"> <li>Assurance 3 of the DOT Standard Title VI Assurances and Nondiscrimination Clauses</li> <li>Assurance 30e.2 of the Airport Sponsor Assurances</li> </ul>	<p>Insert this list in every contract or agreement, unless the sponsor has determined, and the FAA concurs, that the contract or agreement is not subject to the Nondiscrimination Acts and Authorities.</p> <p><b>This list can be omitted if the FAA has determined that the contractor or company is already subject to nondiscrimination requirements.</b></p>	A6.4.5

## **A6.3 SOLICITATION CLAUSE**

**The sponsor must include this clause in:**

- 1) All AIP funded solicitations for bids, requests for proposals, or any work subject to Title VI regulations; and
- 2) All sponsor proposals for negotiated agreements **regardless of funding source.**

### **A6.3.1 Title VI Solicitation Notice**

**Title VI Solicitation Notice:**

The **(Name of Sponsor)**, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 USC §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders or offerors that it will affirmatively ensure that any contract entered into pursuant to this advertisement, [select disadvantaged business enterprises or airport concession disadvantaged business enterprises] will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

## A6.4 CONTRACT CLAUSES

### A6.4.1 Title VI Clauses for Compliance with Nondiscrimination Requirements

The sponsor must include this contract clause in:

- 1) Every contract or agreement (unless the sponsor has determined, and the FAA concurs, that the contract or agreement is not subject to the Nondiscrimination Acts and Authorities); and
- 2) Service contracts with utility companies that are not already subject to nondiscrimination requirements.

#### **Compliance with Nondiscrimination Requirements:**

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “Contractor”), agrees as follows:

1. **Compliance with Regulations:** The Contractor (hereinafter includes consultants) will comply with the Title VI List of Pertinent Nondiscrimination Acts and Authorities, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. **Nondiscrimination:** The Contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor will not participate directly or indirectly in the discrimination prohibited by the Nondiscrimination Acts and Authorities, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR part 21.
3. **Solicitations for Subcontracts, including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the Contractor of the contractor’s obligations under this contract and the Nondiscrimination Acts and Authorities on the grounds of race, color, or national origin.
4. **Information and Reports:** The Contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the sponsor or the Federal Aviation Administration to be pertinent to ascertain compliance with such Nondiscrimination Acts and Authorities and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the Contractor will so certify to the sponsor or the Federal Aviation Administration, as appropriate, and will set forth what efforts it has made to obtain the information.
5. **Sanctions for Noncompliance:** In the event of a Contractor’s noncompliance with the non-discrimination provisions of this contract, the sponsor will impose such contract sanctions as it or the Federal Aviation Administration may determine to be appropriate, including, but not limited to:

- a. Withholding payments to the Contractor under the contract until the Contractor complies; and/or
  - b. Cancelling, terminating, or suspending a contract, in whole or in part.
6. **Incorporation of Provisions:** The Contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations, and directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the sponsor or the Federal Aviation Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Contractor may request the sponsor to enter into any litigation to protect the interests of the sponsor. In addition, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

#### **A6.4.2 Title VI Clauses for Deeds Transferring United States Property**

This is a rare occurrence, and it will be the responsibility of the United States government to include the clause in the contract. It will be included as a covenant running with the land, in any deed from the United States effecting or recording a transfer of real property, structures, use, or improvements thereon or interest therein to a sponsor.

#### **CLAUSES FOR DEEDS TRANSFERRING UNITED STATES PROPERTY**

The following clauses will be included in deeds effecting or recording the transfer of real property, structures, or improvements thereon, or granting interest therein from the United States pursuant to the provisions of the Airport Improvement Program grant assurances.

**NOW, THEREFORE**, the Federal Aviation Administration as authorized by law and upon the condition that the (*Title of Sponsor*) will accept title to the lands and maintain the project constructed thereon in accordance with (*Name of Appropriate Legislative Authority*), for the (**Airport Improvement Program or other program for which land is transferred**), and the policies and procedures prescribed by the Federal Aviation Administration of the U.S. Department of Transportation in accordance and in compliance with all requirements imposed by Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 USC § 2000d to 2000d-4), does hereby remise, release, quitclaim and convey unto the (*Title of Sponsor*) all the right, title and interest of the U.S. Department of Transportation/Federal Aviation Administration in and to said lands described in (*Exhibit A attached hereto or other exhibit describing the transferred property*) and made a part hereof.

#### **(HABENDUM CLAUSE)**

**TO HAVE AND TO HOLD** said lands and interests therein unto (*Title of Sponsor*) and its successors forever, subject, however, to the covenants, conditions, restrictions and reservations herein contained as follows, which will remain in effect for the period during which the real property or structures are used for a purpose for which Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits and will be binding on the (*Title of Sponsor*), its successors and assigns.

The (*Title of Sponsor*), in consideration of the conveyance of said lands and interests in lands, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns, that (1) no person will on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over, or under such lands hereby conveyed [,] [and]\* (2) that the (*Title of Sponsor*) will use the lands and interests in lands and interests in lands so conveyed, in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations and Acts may be amended[, and (3) that in the event of breach of any of the above-mentioned nondiscrimination conditions, the Department will have a right to enter or re-enter said lands and facilities on said land, and that above described land and facilities will thereon revert to and vest in and become the absolute property of the Federal Aviation Administration and its assigns as such interest existed prior to this instruction].\*

(\*Reverter clause and related language to be used only when it is determined that such a clause is necessary in order to make clear the purpose of Title VI.)

#### **A6.4.3 Title VI Clauses for Transfer of Real Property Acquired or Improved Under the Activity, Facility, or Program**

This applies to agreements such as leases where a physical portion of the airport is transferred for use—for example a fuel farm, apron space, or a parking facility—and will be included as a covenant running with the land, in any future deeds, leases, licenses, permits, or similar instruments entered into by the sponsor with other parties for all transfers of real property acquired or improved under the Airport Improvement Program.

#### **CLAUSES FOR TRANSFER OF REAL PROPERTY ACQUIRED OR IMPROVED UNDER THE AIRPORT IMPROVEMENT PROGRAM**

The following clauses will be included in (deeds, licenses, leases, permits, or similar instruments) entered into by the (*Title of Sponsor*) pursuant to the provisions of the Airport Improvement Program grant assurances.

- A. The (grantee, lessee, permittee, etc. as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree [in the case of deeds and leases add “as a covenant running with the land”] that:
  1. In the event facilities are constructed, maintained, or otherwise operated on the property described in this (deed, license, lease, permit, etc.) for a purpose for which a Federal Aviation Administration activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, the (grantee, licensee, lessee, permittee, etc.) will maintain and operate such facilities and services in compliance with all requirements imposed by the Nondiscrimination Acts and Regulations listed in the Pertinent List of Nondiscrimination Authorities (as may be amended) such that no person on the grounds of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.
- B. With respect to licenses, leases, permits, etc., in the event of breach of any of the above Nondiscrimination covenants, (*Title of Sponsor*) will have the right to terminate the (lease,

license, permit, etc.) and to enter, re-enter, and repossess said lands and facilities thereon, and hold the same as if the (lease, license, permit, etc.) had never been made or issued.\*

- C. With respect to a deed, in the event of breach of any of the above Nondiscrimination covenants, the (*Title of Sponsor*) will have the right to enter or re-enter the lands and facilities thereon, and the above described lands and facilities will there upon revert to and vest in and become the absolute property of the (*Title of Sponsor*) and its assigns.\*

(\*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

**A6.4.4 Title VI Clauses for Construction/Use/Access to Real Property Acquired Under the Activity, Facility or Program**

This applies to agreements such as leases of concession space in a terminal and any future deeds, leases, licenses, permits, or similar instruments entered into by the sponsor with other parties for the construction or use of, or access to, space on, over, or under real property acquired or improved under the Airport Improvement Program.

**CLAUSES FOR CONSTRUCTION/USE/ACCESS TO REAL PROPERTY ACQUIRED UNDER THE ACTIVITY, FACILITY OR PROGRAM**

The following clauses will be included in deeds, licenses, permits, or similar instruments/agreements entered into by (*Title of Sponsor*) pursuant to the provisions of the Airport Improvement Program grant assurances.

- A. The (grantee, licensee, permittee, etc., as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree (in the case of deeds and leases add, “as a covenant running with the land”) that (1) no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities, (2) that in the construction of any improvements on, over, or under such land, and the furnishing of services thereon, no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, (3) that the (grantee, licensee, lessee, permittee, etc.) will use the premises in compliance with all other requirements imposed by or pursuant to the List of discrimination Acts And Authorities.
- B. With respect to (licenses, leases, permits, etc.), in the event of breach of any of the above nondiscrimination covenants, (*Title of Sponsor*) will have the right to terminate the (license, permit, etc., as appropriate) and to enter or re-enter and repossess said land and the facilities thereon, and hold the same as if said (license, permit, etc., as appropriate) had never been made or issued.\*
- C. With respect to deeds, in the event of breach of any of the above nondiscrimination covenants, (*Title of Sponsor*) will there upon revert to and vest in and become the absolute property of (*Title of Sponsor*) and its assigns.\*

(\*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

#### **A6.4.5 Title VI List of Pertinent Nondiscrimination Acts and Authorities**

Insert this list in every contract or agreement, unless the sponsor has determined and the FAA concurs, that the contract or agreement is not subject to the Nondiscrimination Acts and Authorities. This list can be omitted if the FAA has determined that the contractor or company is already subject to nondiscrimination requirements.

##### **Title VI List of Pertinent Nondiscrimination Acts and Authorities**

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “Contractor”) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 USC § 2000d *et seq.*, 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin);
- 49 CFR part 21 (Non-discrimination in Federally-assisted programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964);
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 USC § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Section 504 of the Rehabilitation Act of 1973 (29 USC § 794 *et seq.*), as amended (prohibits discrimination on the basis of disability); and 49 CFR part 27;
- The Age Discrimination Act of 1975, as amended (42 USC § 6101 *et seq.*) (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982 (49 USC § 471, Section 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987 (PL 100-209) (broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act of 1990, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 USC §§ 12131 – 12189) as implemented by U.S. Department of Transportation regulations at 49 CFR parts 37 and 38;
- The Federal Aviation Administration’s Nondiscrimination statute (49 USC § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);

- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 USC 1681 et seq).

## **A7 CLEAN AIR AND WATER POLLUTION CONTROL**

### **A7.1 SOURCE**

2 CFR § 200, Appendix II(G)

### **A7.2 APPLICABILITY**

**Contract Types** – This provision is required for all contracts and lower tier contracts that exceed \$150,000.

**Use of Provision** – No mandatory language provided. The following language is acceptable to the FAA and meets the intent of this requirement. If the sponsor uses different language, the sponsor's language must fully satisfy the requirements of Appendix II to 2 CFR §200.

### **A7.3 CONTRACT CLAUSE**

#### **CLEAN AIR AND WATER POLLUTION CONTROL**

Contractor agrees to comply with all applicable standards, orders, and regulations issued pursuant to the Clean Air Act (42 USC § 740-7671q) and the Federal Water Pollution Control Act as amended (33 USC § 1251-1387). The Contractor agrees to report any violation to the Owner immediately upon discovery. The Owner assumes responsibility for notifying the Environmental Protection Agency (EPA) and the Federal Aviation Administration.

Contractor must include this requirement in all subcontracts that exceeds \$150,000.

## **A8 CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS**

### **A8.1 SOURCE**

2 CFR § 200, Appendix II(E)

### **A8.2 APPLICABILITY**

Contract Workhours and Safety Standards Act Requirements (CWHSSA) requires contractors and subcontractors on covered contracts to pay laborers and mechanics employed in the performance of the contracts one and one-half times their basic rate of pay for all hours worked over 40 in a workweek. CWHSSA prohibits unsanitary, hazardous, or dangerous working conditions on federally assisted projects. The Wage and Hour Division (WHD) within the U.S. Department of Labor (DOL) enforces the compensation requirements of this Act, while DOL's Occupational Safety and Health Administration (OSHA) enforces the safety and health requirements

#### **Contract Types –**

*Construction* – This provision applies to all contracts and lower tier contracts that exceed \$100,000, and employ laborers, mechanics, watchmen, and guards.

*Equipment* – This provision applies to any equipment project exceeding \$100,000 that involves installation of equipment onsite (e.g. electrical vault equipment). This provision does not apply to equipment acquisition projects where the manufacture of the equipment takes place offsite at the vendor plant (e.g. ARFF and SRE vehicles).

*Professional Services* – This provision applies to professional service agreements that exceed \$100,000 and employs laborers, mechanics, watchmen, and guards. This includes members of survey crews and exploratory drilling operations.

*Property* – While most land transactions do not involve employment of laborers, mechanics, watchmen, and guards, under certain circumstances, a property acquisition project could require such employment. Examples include the installation of property fencing or testing for environmental contamination

**Use of Provision – MANDATORY TEXT.** Sponsors must incorporate this text without modification.

### **A8.3 CONTRACT CLAUSE**

#### **CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS**

##### **1. Overtime Requirements.**

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic, including watchmen and guards, in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a

rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

#### 2. Violation; Liability for Unpaid Wages; Liquidated Damages.

In the event of any violation of the clause set forth in paragraph (1) of this clause, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this clause, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this clause.

#### 3. Withholding for Unpaid Wages and Liquidated Damages.

The Federal Aviation Administration (FAA) or the Owner shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this clause.

#### 4. Subcontractors.

The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs (1) through (4) and also a clause requiring the subcontractor to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this clause.

## **A9 COPELAND “ANTI-KICKBACK” ACT**

### **A9.1 SOURCE**

2 CFR § 200, Appendix II(D)

29 CFR Parts 3 and 5

### **A9.2 APPLICABILITY and PURPOSE**

The Copeland (Anti-Kickback) Act (18 USC 874 and 40 USC 3145) makes it unlawful to induce by force, intimidation, threat of dismissal from employment, or by any other manner, any person employed in the construction or repair of public buildings or public works, financed in whole or in part by the United States, to give up any part of the compensation to which that person is entitled under a contract of employment. The Copeland Act also requires each contractor and subcontractor to furnish weekly a statement of compliance with respect to the wages paid each employee during the preceding week.

#### **Contract Types –**

*Construction* – This provision applies to all construction contracts and subcontracts financed under the AIP that exceed \$2,000.

*Equipment* – This provision applies to all equipment installation projects (e.g. electrical vault improvements) financed under the AIP that exceed \$2,000. This provision does not apply to equipment acquisitions where the equipment is manufactured at the vendor’s plant (e.g. SRE and ARFF vehicles).

*Professional Services* –The emergence of different project delivery methods has created situations where Professional Service Agreements (PSAs) include tasks that meet the definition of construction, alteration, or repair as defined in 29 CFR Part 5. If such tasks result in work that qualifies as construction, alteration, or repair and it exceeds \$2,000, the PSA must incorporate the Copeland Anti-kickback provision.

*Property* –Ordinarily, land acquisition projects would not involve employment of laborers or mechanics and thus the Copeland Anti-Kickback provision would not apply. However, land projects that involve installation of boundary fencing and demolition of structures would involve laborers and mechanics. The sponsor must include this provision if the land acquisition project involves employment of laborers or mechanics for a contract exceeding \$2,000.

**Use of Provision – MANDATORY TEXT.** 29 CFR Part 5 establishes specific language a sponsor must use in construction contracts. The sponsor may not make any modification to the standard language. Architectural/Engineering (A/E) firms that employ laborers and mechanics on a task that meets the definition of construction, alteration, or repair are acting as a contractor. The sponsor may not substitute the term “contractor” for “consultant” in such instances.

### **A9.3 CONTRACT CLAUSE**

#### **COPELAND “ANTI-KICKBACK” ACT**

Contractor must comply with the requirements of the Copeland “Anti-Kickback” Act (18 USC 874 and 40 USC 3145), as supplemented by Department of Labor regulation 29 CFR part 3. Contractor and subcontractors are prohibited from inducing, by any means, any person employed on the project to give up any part of the compensation to which the employee is entitled. The Contractor and each Subcontractor must submit to the Owner, a weekly statement on the wages paid to each employee performing on covered work during the prior week. Owner must report any violations of the Act to the Federal Aviation Administration.

## **A10 DAVIS-BACON REQUIREMENTS**

### **A10.1 SOURCE**

2 CFR § 200, Appendix II(D)

29 CFR Part 5

### **A10.2 APPLICABILITY**

The Davis-Bacon Act ensures that laborers and mechanics employed under the contract receive pay no less than the locally prevailing wages and fringe benefits as determined by the Department of Labor.

#### **Contract Types –**

*Construction* – Incorporate into all construction contracts and subcontracts that exceed \$2,000 and include funding from the AIP.

*Equipment* – This provision applies to all equipment installation projects (e.g. electrical vault improvements) financed under the AIP that exceed \$ 2, 000. This provision does not apply to equipment acquisitions where the equipment is manufactured at the vendor’s plant (e.g. SRE and ARFF vehicles)

*Professional Services* – The emergence of different project delivery methods has created situations where Professional Service Agreements (PSAs) includes tasks that meet the definition of construction, alteration, or repair as defined in 29 CFR Part 5. If such tasks result in work that qualifies as construction, alteration, or repair and it exceeds \$2,000, the PSA must incorporate this clause.

*Property* – Ordinarily, land acquisition projects would not involve employment of laborers or mechanics and thus the provision would not apply. However, land projects that involve installation of boundary fencing and demolition of structures would involve laborers and mechanics. The sponsor must include this provision if the land acquisition project involves employment of laborers or mechanics for a contract exceeding \$2,000.

*Fencing Projects* – Fencing projects that exceed \$2,000 must include this provision.

**Use of Provision – MANDATORY TEXT.** 29 CFR part 5 establishes specific language a sponsor must use. The sponsor may not make any modification to the standard language. A/E firms that employ laborers and mechanics on a task that meets the definition of construction, alteration, or repair are acting as a contractor. The sponsor may not substitute the term “Contractor” for “Consultant” in such instances.

### **A10.3 CONTRACT CLAUSE**

#### **DAVIS-BACON REQUIREMENTS**

1. Minimum Wages.

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any

account (except such payroll deductions as are permitted by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalent thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided* that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under (1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can easily be seen by the workers.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- (1) The work to be performed by the classification requested is not performed by a classification in the wage determination;
- (2) The classification is utilized in the area by the construction industry; and
- (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the Contractor, the laborers, or mechanics to be employed in the classification, or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits where appropriate), the contracting officer shall

refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii) (B) or (C) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program: *Provided* that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

## 2. Withholding.

The Federal Aviation Administration or the sponsor shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of work, all or part of the wages required by the contract, the Federal Aviation Administration may, after written notice to the Contractor, Sponsor, Applicant, or Owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

## 3. Payrolls and Basic Records.

(i) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 1(b)(2)(B) of the Davis-Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records that show that the commitment to provide such benefits is

enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and that show the costs anticipated or the actual costs incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the Contractor will submit the payrolls to the applicant, Sponsor, or Owner, as the case may be, for transmission to the Federal Aviation Administration. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (*e.g.* the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at [www.dol.gov/whd/forms/wh347instr.htm](http://www.dol.gov/whd/forms/wh347instr.htm) or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker and shall provide them upon request to the Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the Contractor will submit them to the applicant, sponsor, or Owner, as the case may be, for transmission to the Federal Aviation Administration, the Contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, Sponsor, or Owner).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

- (1) The payroll for the payroll period contains the information required to be provided under 29 CFR § 5.5(a)(3)(ii), the appropriate information is being maintained under 29 CFR § 5.5 (a)(3)(i), and that such information is correct and complete;
- (2) Each laborer and mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations 29 CFR Part 3;
- (3) Each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the “Statement of Compliance” required by paragraph (3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The Contractor or subcontractor shall make the records required under paragraph (3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the sponsor, the Federal Aviation Administration, or the Department of Labor and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the Contractor, Sponsor, applicant, or Owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

#### 4. Apprentices and Trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman’s hourly rate) specified in the Contractor’s or subcontractor’s registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice’s level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau,

withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination that provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate that is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal Employment Opportunity. The utilization of apprentices, trainees, and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

#### 5. Compliance with Copeland Act Requirements.

The Contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this contract.

#### 6. Subcontracts.

The Contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR Part 5.5(a)(1) through (10) and such other clauses as the Federal Aviation Administration may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR Part 5.5.

#### 7. Contract Termination: Debarment.

A breach of the contract clauses in paragraph 1 through 10 of this section may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

#### 8. Compliance with Davis-Bacon and Related Act Requirements.

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.

#### 9. Disputes Concerning Labor Standards.

Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

#### 10. Certification of Eligibility.

(i) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 USC 1001.

## **A11 DEBARMENT AND SUSPENSION**

### **A11.1 SOURCE**

2 CFR part 180 (Subpart C)

2 CFR part 1200

DOT Order 4200.5

### **A11.2 APPLICABILITY**

The sponsor must verify that the firm or individual that it is entering into a contract with is not presently suspended, excluded, or debarred by any Federal department or agency from participating in federally assisted projects. The sponsor accomplishes this by:

- 1) Checking the System for Award Management (SAM.gov) to verify that the firm or individual is not listed in SAM.gov as being suspended, debarred, or excluded;
- 2) Collecting a certification from the firm or individual that it is not suspended, debarred, or excluded; and
- 3) Incorporating a clause in the contract that requires lower tier contracts to verify that no suspended, debarred, or excluded firm or individual is included in the project.

**Contract Types** – This requirement applies to *covered transactions*, which are defined in 2 CFR part 180. AIP funded contracts are non-procurement transactions, as defined by §180.970. Covered transactions include any AIP-funded contract, regardless of tier, that is awarded by a contractor, subcontractor, supplier, consultant, or its agent or representative in any transaction, if the amount of the contract is expected to equal or exceed \$25,000. This includes contracts associated with land acquisition projects.

**Use of Provision** – No mandatory language provided. The following language is acceptable to the FAA in meeting the intent of this requirement. If the sponsor uses different language, the sponsor's language must fully satisfy the requirements of 2 CFR part 180. For professional service agreements, sponsor may substitute bidder/offeror with consultant.

### **A11.3 SOLICITATION CLAUSE**

#### **A11.3.1 Bidder or Offeror Certification**

##### **CERTIFICATION OF OFFERER/BIDDER REGARDING DEBARMENT**

By submitting a bid/proposal under this solicitation, the bidder or offeror certifies that neither it nor its principals are presently debarred or suspended by any Federal department or agency from participation in this transaction.

### **A11.3.2 Lower Tier Contract Certification**

#### **CERTIFICATION OF LOWER TIER CONTRACTORS REGARDING DEBARMENT**

The successful bidder, by administering each lower tier subcontract that exceeds \$25,000 as a “covered transaction”, must verify each lower tier participant of a “covered transaction” under the project is not presently debarred or otherwise disqualified from participation in this federally assisted project. The successful bidder will accomplish this by:

1. Checking the System for Award Management at website: <http://www.sam.gov>.
2. Collecting a certification statement similar to the Certification of Offerer /Bidder Regarding Debarment, above.
3. Inserting a clause or condition in the covered transaction with the lower tier contract.

If the Federal Aviation Administration later determines that a lower tier participant failed to disclose to a higher tier participant that it was excluded or disqualified at the time it entered the covered transaction, the FAA may pursue any available remedies, including suspension and debarment of the non-compliant participant.

## **A12 DISADVANTAGED BUSINESS ENTERPRISE**

### **A12.1 SOURCE**

49 CFR part 26

### **A12.2 APPLICABILITY**

A sponsor that anticipates awarding \$250,000 or more in AIP funded prime contracts in a federal fiscal year must have an approved Disadvantaged Business Enterprise (DBE) program on file with the FAA Office of Civil Rights (§ 26.21). The approved DBE program will identify a 3-year overall program goal that the sponsor bases on the availability of ready, willing, and able DBEs relative to all businesses ready, willing, and able to participate on the project (§ 26.45).

**Contract Types** – Sponsors with a DBE program on file with the FAA must include the three following provisions, if applicable:

- 1) Clause in all solicitations for proposals for which a contract goal has been established,
- 2) Clause in each prime contract, and
- 3) Clause in solicitations that are obtaining DBE participation through race/gender neutral means.

#### **Use of Provision –**

1. *Solicitations with a DBE Project Goal* – No mandatory language provided. 49 CFR §26.53 requires a sponsor's solicitation to address what a contractor must submit on proposed DBE participation. The language of A12.3.1 is acceptable to the FAA in meeting the intent of this requirement. If the sponsor uses different language, the sponsor's revised language must fully satisfy these requirements. The sponsor may require the contractor's submittal on proposed DBE participation either at bid opening as a matter of responsiveness or within five days of bid opening as a matter of responsibility.
2. *Solicitations Relying on Race-gender Neutral Means* – No mandatory language provided. The language of A12.3.2 is acceptable to the FAA in meeting the intent of this requirement. If the sponsor uses different language, the sponsor's revised language must fully satisfy requirements for a sponsor that is not applying a project specific contract goal but is covered by a DBE program on file with the FAA.
3. *Contracts Covered by DBE Program* – **MANDATORY TEXT PROVIDED**. Sponsors must incorporate this language if they have a DBE program on file with the FAA. This includes projects where DBE participation is obtained through race-gender neutral means (i.e. no project goal). Sections §26.13 and §26.29 establish mandatory language for contractor assurance and prompt payment. The sponsor must not modify the language.
4. Sponsors that are not required to have a DBE program on file with the FAA are not required to include DBE provisions and clauses.

## **A12.3 REQUIRED PROVISIONS**

### **A12.3.1 Solicitation Language (Solicitations that include a Project Goal)**

Information Submitted as a matter of bidder responsiveness:

The Owner's award of this contract is conditioned upon Bidder or Offeror satisfying the good faith effort requirements of 49 CFR §26.53.

As a condition of bid responsiveness, the Bidder or Offeror must submit the following information with its proposal on the forms provided herein:

- 1) The names and addresses of Disadvantaged Business Enterprise (DBE) firms that will participate in the contract;
- 2) A description of the work that each DBE firm will perform;
- 3) The dollar amount of the participation of each DBE firm listed under (1)
- 4) Written statement from Bidder or Offeror that attests their commitment to use the DBE firm(s) listed under (1) to meet the Owner's project goal; and
- 5) If Bidder or Offeror cannot meet the advertised project DBE goal, evidence of good faith efforts undertaken by the Bidder or Offeror as described in appendix A to 49 CFR part 26.

Information submitted as a matter of bidder responsibility:

The Owner's award of this contract is conditioned upon Bidder or Offeror satisfying the good faith effort requirements of 49 CFR §26.53.

The successful Bidder or Offeror must provide written confirmation of participation from each of the DBE firms the Bidder or Offeror lists in its commitment within five days after bid opening.

- 1) The names and addresses of Disadvantaged Business Enterprise (DBE) firms that will participate in the contract;
- 2) A description of the work that each DBE firm will perform;
- 3) The dollar amount of the participation of each DBE firm listed under (1)
- 4) Written statement from Bidder or Offeror that attests their commitment to use the DBE firm(s) listed under (1) to meet the Owner's project goal; and
- 5) If Bidder or Offeror cannot meet the advertised project DBE goal, evidence of good faith efforts undertaken by the Bidder or Offeror as described in appendix A to 49 CFR part 26.

### **A12.3.2 Solicitation Language (Race/Gender Neutral Means)**

The requirements of 49 CFR part 26 apply to this contract. It is the policy of the [Insert Name of Owner] to practice nondiscrimination based on race, color, sex, or national origin in the award or performance of this contract. The Owner encourages participation by all firms qualifying under this solicitation regardless of business size or ownership.

**A12.3.3 Prime Contracts (Projects Covered by a DBE Program)**

**DISADVANTAGED BUSINESS ENTERPRISES**

**Contract Assurance (§ 26.13) –**

The Contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of Department of Transportation-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Owner deems appropriate, which may include, but is not limited to:

- 1) Withholding monthly progress payments;
- 2) Assessing sanctions;
- 3) Liquidated damages; and/or
- 4) Disqualifying the Contractor from future bidding as non-responsible.

**Prompt Payment (§26.29) –** The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than thirty (30) days from the receipt of each payment the prime contractor receives from City of Flagstaff. The prime contractor agrees further to return retainage payments to each subcontractor within thirty (30) days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the City of Flagstaff. This clause applies to both DBE and non-DBE subcontractors.

## **A13 DISTRACTED DRIVING**

### **A13.1 SOURCE**

Executive Order 13513

DOT Order 3902.10

### **A13.2 APPLICABILITY**

The FAA encourages recipients of Federal grant funds to adopt and enforce safety policies that decrease crashes by distracted drivers, including policies to ban text messaging while driving when performing work related to a grant or subgrant.

**Contract Types** – Sponsors must insert this provision in all AIP funded contracts that exceed the micro-purchase threshold of 2 CFR §200.67 (currently set at \$3,500).

**Use of Provision** – No mandatory text provided. The following language is acceptable to the FAA in meeting the intent of this requirement. If the sponsor uses different language, the sponsor’s revised language must fully satisfy these requirements.

### **A13.3 CONTRACT CLAUSE**

#### **TEXTING WHEN DRIVING**

In accordance with Executive Order 13513, “Federal Leadership on Reducing Text Messaging While Driving”, (10/1/2009) and DOT Order 3902.10, “Text Messaging While Driving”, (12/30/2009), the Federal Aviation Administration encourages recipients of Federal grant funds to adopt and enforce safety policies that decrease crashes by distracted drivers, including policies to ban text messaging while driving when performing work related to a grant or subgrant.

In support of this initiative, the Owner encourages the Contractor to promote policies and initiatives for its employees and other work personnel that decrease crashes by distracted drivers, including policies that ban text messaging while driving motor vehicles while performing work activities associated with the project. The Contractor must include the substance of this clause in all sub-tier contracts exceeding \$3,500 that involve driving a motor vehicle in performance of work activities associated with the project.

## **A14 ENERGY CONSERVATION REQUIREMENTS**

### **A14.1 SOURCE**

2 CFR § 200, Appendix II(H)

### **A14.2 APPLICABILITY**

The Energy Conservation Requirements of 2 CFR § 200 Appendix II(H) requires this provision on energy efficiency.

**Contract Types** – The sponsor must include this provision in all AIP funded contracts and lower-tier contracts.

**Use of Provision** – No mandatory text provided. The following language is acceptable to the FAA and meets the intent of this requirement. If the sponsor uses different language, the sponsor’s revised language must fully satisfy these requirements. Sponsor may substitute “Contractor and subcontractor” with “Consultant and sub-consultant” for professional service agreements.

### **A14.3 CONTRACT CLAUSE**

#### **ENERGY CONSERVATION REQUIREMENTS**

Contractor and Subcontractor agree to comply with mandatory standards and policies relating to energy efficiency as contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 USC 6201 *et seq*).

## **A15 DRUG FREE WORKPLACE REQUIREMENTS**

### **A15.1 SOURCE**

49 CFR part 32

Drug-Free Workplace Act of 1988 (41 U.S.C. 701 *et seq.*, as amended)

### **A15.2 APPLICABILITY**

The Drug-Free Workplace Act of 1988 requires some Federal contractors and *all* Federal grantees to agree that they will provide drug-free workplaces as a condition of receiving a contract or grant from a Federal agency. The Act does **not** apply to contractors, subcontractors, or subgrantees, although the Federal grantees workplace may be where the contractors, subcontractors, or subgrantees are working.

**Contract Types** – This provision applies to all AIP funded projects, but not to the contracts between the grantee (the sponsor) and a contractor, subcontractors, suppliers, or subgrantees.

**Use of Provision** – No mandatory or recommended text provided because the requirements do not extend beyond the sponsor level.

### **A15.3 CONTRACT CLAUSE**

None.

## **A16 EQUAL EMPLOYMENT OPPORTUNITY (EEO)**

### **A16.1 SOURCE**

2 CFR 200, Appendix II(C)

41 CFR § 60-1.4

41 CFR § 60-4.3

Executive Order 11246

### **A16.2 APPLICABILITY**

The purpose of this provision is to provide equal opportunity for all persons, without regard to race, color, religion, sex, or national origin who are employed or seeking employment with contractors performing under a federally assisted construction contract. There are two provisions — a construction clause and a specification clause.

The equal opportunity contract clause must be included in any contract or subcontract when the amount exceeds \$10,000. Once the equal opportunity clause is determined to be applicable, the contract or subcontract must include the clause for the remainder of the year, regardless of the amount or the contract.

#### **Contract Types –**

*Construction* – The sponsor must incorporate contract and specification language in all construction contracts and subcontracts as required above.

*Equipment* – The sponsor must incorporate contract and specification language into all equipment contracts as required above that involves installation of equipment onsite (e.g. electrical vault equipment). This provision does not apply to equipment acquisition projects where the manufacture of the equipment takes place offsite at the vendor plant (e.g. ARFF and SRE vehicles).

*Professional Services* – The sponsor must include contract and specification language into all professional service agreements as required above.

*Property* – The sponsor must include contract and specification language into all land acquisition projects that include work that qualifies as construction work as defined by 41 CFR part 60 as required above. An example is installation of boundary fencing.

**Use of Provision – MANDATORY TEXT.** 41 CFR § 60-1.4 provides the mandatory ***contract*** language. 41 CFR § 60-4.3 provides the mandatory ***specification*** language. The sponsor must incorporate these clauses without modification.

## **A16.3 MANDATORY CONTRACT CLAUSE**

### **A16.3.1 EEO Contract Clause**

#### **EQUAL OPPORTUNITY CLAUSE**

During the performance of this contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identify, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff, or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.

(3) The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the

administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: *Provided, however*, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

### **A16.3.2 EEO Specification**

#### **STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS**

1. As used in these specifications:

- a. “Covered area” means the geographical area described in the solicitation from which this contract resulted;
- b. “Director” means Director, Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor, or any person to whom the Director delegates authority;
- c. “Employer identification number” means the Federal social security number used on the Employer’s Quarterly Federal Tax Return, U.S. Treasury Department Form 941;
- d. “Minority” includes:
  - (1) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
  - (2) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin regardless of race);
  - (3) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
  - (4) American Indian or Alaskan native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR part 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors shall be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each contractor or subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO clause and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other

contractors or subcontractors toward a goal in an approved Plan does not excuse any covered contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in a geographical area where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement nor the failure by a union with whom the Contractor has a collective bargaining agreement to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees shall be employed by the Contractor during the training period and the Contractor shall have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees shall be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and shall implement affirmative action steps at least as extensive as the following:

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source, or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor

by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore along with whatever additional actions the Contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or female sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions, including specific review of these items, with onsite supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other contractors and subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students; and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations, such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer, and vacation employment to minority and female youth both on the site and in other areas of a contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel, for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are non-segregated except that separate or single user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations, which assist in fulfilling one or more of their affirmative action obligations (7a through 7p). The efforts of a contractor association, joint contractor union, contractor community, or other similar groups of which the Contractor is a member and participant may be asserted as fulfilling any one or more of its obligations under 7a through 7p of these specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, if the particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally), the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination, and cancellation of existing

subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR part 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records shall at least include for each employee, the name, address, telephone number, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g. those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

## **A17 FEDERAL FAIR LABOR STANDARDS ACT (FEDERAL MINIMUM WAGE)**

### **A17.1 SOURCE**

29 USC § 201, et seq

### **A17.2 APPLICABILITY**

The U.S. Department of Labor (DOL) Wage and Hour Division administers the Fair Labor Standards Act (FLSA). This act prescribes federal standards for basic minimum wage, overtime pay, record keeping, and child labor standards.

**Contract Types** – Per the Department of Labor, all employees of certain enterprises having workers engaged in interstate commerce; producing goods for interstate commerce; or handling, selling, or otherwise working on goods or materials that have been moved in or produced for such commerce by any person are covered by the FLSA.

All consultants, sub-consultants, contractors, and subcontractors employed under this federally assisted project must comply with the FLSA.

*Professional Services* – 29 CFR § 213 exempts employees in a bona fide executive, administrative or professional capacity. Because professional firms employ individuals that are not covered by this exemption, the sponsor’s agreement with a professional services firm must include the FLSA provision.

**Use of Provision** – No mandatory text provided. The following language is acceptable to the FAA and meets the intent of this requirement. If the sponsor uses different language, the sponsor’s language must fully satisfy the requirements of 29 USC § 201. The sponsor must select *contractor* or *consultant*, as appropriate for the contract.

### **A17.3 SOLICITATION CLAUSE**

All contracts and subcontracts that result from this solicitation incorporate by reference the provisions of 29 CFR part 201, the Federal Fair Labor Standards Act (FLSA), with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for full and part-time workers.

The [*Contractor* | *Consultant*] has full responsibility to monitor compliance to the referenced statute or regulation. The [*Contractor* | *Consultant*] must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division.

## **A18 LOBBYING AND INFLUENCING FEDERAL EMPLOYEES**

### **A18.1 SOURCE**

31 USC § 1352 – Byrd Anti-Lobbying Amendment

2 CFR part 200, Appendix II(J)

49 CFR part 20, Appendix A

### **A18.2 APPLICABILITY**

Consultants and contractors that apply or bid for an award of \$100,000 or more must certify that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or another award covered by 31 USC 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award.

**Contract Types** – The sponsor must incorporate this provision into all contracts exceeding \$100,000.

**Use of Provision – MANDATORY TEXT.** Appendix A to 49 CFR Part 20 prescribes language the sponsor must use. The sponsor must incorporate this provision without modification.

### **A18.3 CONTRACT CLAUSE**

#### **CERTIFICATION REGARDING LOBBYING**

The Bidder or Offeror certifies by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Bidder or Offeror, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, subgrants, and contracts under

grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

## **A19 PROHIBITION of SEGREGATED FACILITIES**

### **A19.1 SOURCE**

41 CFR § 60

### **A19.2 APPLICABILITY**

The contractor must comply with the requirements of the EEO clause by ensuring that facilities they provide for employees are free of segregation on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin. This clause must be included in all contracts that include the equal opportunity clause, regardless of the amount of the contract.

**Contract Types** – AIP sponsors must incorporate the Prohibition of Segregated Facilities clause in any contract containing the Equal Employment Opportunity clause of 41 CFR §60.1. This obligation flows down to subcontract and sub-tier purchase orders containing the Equal Employment Opportunity clause.

*Construction* – Construction work means construction, rehabilitation, alteration, conversion, extension, demolition or repair of buildings, highways, or other changes or improvements to real property, including facilities providing utility services. The term also includes the supervision, inspection, and other onsite functions incidental to the actual construction.

*Equipment* – On site installation of equipment such as airfield lighting control equipment meets the definition of construction and thus this provision would apply. This provision does not apply to equipment projects involving manufacture of the item at a vendor’s manufacturing plant. An example would be the manufacture of a SRE or ARFF vehicle.

*Professional Services* – Professional services that include tasks that qualify as construction work as defined by 41 CFR part 60. Examples include the installation of noise monitoring equipment.

*Property/Land* – Land acquisition contracts that include tasks that qualify as construction work as defined by 41 CFR part 60. Examples include demolition of structures or installation of boundary fencing.

**Use of Provision** – No mandatory text provided. The following language is acceptable to the FAA and meets the intent of this requirement. If the sponsor uses different language, the sponsor’s language must fully satisfy the requirements of 41 CFR § 60.

### **A19.3 CONTRACT CLAUSE**

#### **PROHIBITION OF SEGREGATED FACILITIES**

(a) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Employment Opportunity clause in this contract.

(b) “Segregated facilities,” as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Employment Opportunity clause of this contract.

## **A20 OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970**

### **A20.1 SOURCE**

29 CFR part 1910

### **A20.2 APPLICABILITY**

**Contract Types** – All contracts and subcontracts must comply with the Occupational Safety and Health Act of 1970 (OSH). The U.S. Department of Labor Occupational Safety and Health Administration (OSHA) oversees the workplace health and safety standards wage provisions from OSH.

**Use of Provision** – No mandatory text provided. The following language is acceptable to the FAA and meets the intent of this requirement. If the sponsor uses different language, the sponsor’s language must fully satisfy the requirements of 20 CFR part 1910.

### **A20.3 CONTRACT CLAUSE**

All contracts and subcontracts that result from this solicitation incorporate by reference the requirements of 29 CFR Part 1910 with the same force and effect as if given in full text. The employer must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. The employer retains full responsibility to monitor its compliance and their subcontractor’s compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (20 CFR Part 1910). The employer must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.

## **A21 PROCUREMENT OF RECOVERED MATERIALS**

### **A21.1 SOURCE**

2 CFR § 200.322

40 CFR part 247

Solid Waste Disposal Act

### **A21.2 APPLICABILITY**

Sponsors of AIP funded development and equipment projects must comply with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. Section 6002 emphasizes maximizing energy and resource recovery through use of affirmative procurement actions for recovered materials identified in the Environmental Protection Agency (EPA) guidelines codified at 40 CFR part 247. When acquiring items designated in the guidelines, the sponsor must procure items that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition.

**Contract Types** – This provision applies to any contracts that include procurement of products designated in subpart B of 40 CFR part 247 where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired by the preceding fiscal year exceeded \$10,000.

*Construction and Equipment* – Include this provision in all construction and equipment projects.

*Professional Services and Property* – Include this provision if the agreement includes procurement of a product that exceeds \$10,000.

**Use of Provision** – No mandatory text provided. The following language is acceptable to the FAA and meets the intent of this requirement. If the sponsor uses different language, the sponsor’s language must fully satisfy the requirements of 2 CFR § 200.

### **A21.3 CONTRACT CLAUSE**

#### **PROCUREMENT OF RECOVERED MATERIALS**

Contractor and subcontractor agree to comply with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, and the regulatory provisions of 40 CFR Part 247. In the performance of this contract and to the extent practicable, the Contractor and subcontractors are to use products containing the highest percentage of recovered materials for items designated by the Environmental Protection Agency (EPA) under 40 CFR Part 247 whenever:

- 1) The contract requires procurement of \$10,000 or more of a designated item during the fiscal year; or
- 2) The contractor has procured \$10,000 or more of a designated item using Federal funding during the previous fiscal year.

The list of EPA-designated items is available at [www.epa.gov/smm/comprehensive-procurement-guidelines-construction-products](http://www.epa.gov/smm/comprehensive-procurement-guidelines-construction-products).

Section 6002(c) establishes exceptions to the preference for recovery of EPA-designated products if the contractor can demonstrate the item is:

- a) Not reasonably available within a timeframe providing for compliance with the contract performance schedule;
- b) Fails to meet reasonable contract performance requirements; or
- c) Is only available at an unreasonable price.

## **A22 RIGHT TO INVENTIONS**

### **A22.1 SOURCE**

2 CFR § 200, Appendix II(F)

37 CFR §401

### **A22.2 APPLICABILITY**

**Contract Types** – This provision applies to all contracts and subcontracts with small business firms or nonprofit organizations that include performance of *experimental, developmental, or research work*. This clause is not applicable to construction, equipment, or professional service contracts unless the contract includes *experimental, developmental, or research work*.

**Use of Provision** – No mandatory text provided. The following language is acceptable to the FAA and meets the intent of this requirement. If the sponsor uses different language, the sponsor’s language must fully satisfy the requirements of Appendix II to 2 CFR part 200.

### **A22.3 CONTRACT CLAUSE**

#### **RIGHTS TO INVENTIONS**

Contracts or agreements that include the performance of experimental, developmental, or research work must provide for the rights of the Federal Government and the Owner in any resulting invention as established by 37 CFR part 401, Rights to Inventions Made by Non-profit Organizations and Small Business Firms under Government Grants, Contracts, and Cooperative Agreements. This contract incorporates by reference the patent and inventions rights as specified within 37 CFR §401.14. Contractor must include this requirement in all sub-tier contracts involving experimental, developmental, or research work.

## **A23 SEISMIC SAFETY**

### **A23.1 SOURCE**

49 CFR part 41

### **A23.2 APPLICABILITY**

**Contract Types** – This provision applies to construction of new buildings and additions to existing buildings financed in whole or in part through the Airport Improvement Program.

*Professional Services*– Sponsor must incorporate this clause in any contract involved in the construction of new buildings or structural addition to existing buildings.

*Construction* – Sponsor must incorporate this clause in any contract involved in the construction of new buildings or structural addition to existing buildings.

*Equipment* – Sponsor must include the construction provision if the project involves construction or structural addition to a building such as an electrical vault project to accommodate or install equipment.

*Land* – This provision will not typically apply to a property/land project.

**Use of Provision** – No mandatory text provided. The following language is acceptable to the FAA and meets the intent of this requirement. If the sponsor uses different language, the sponsor’s language must fully satisfy the requirements of 49 CFR part 41.

### **A23.3 CONTRACT CLAUSE**

#### **A23.3.1 Professional Service Agreements for Design**

##### **SEISMIC SAFETY**

In the performance of design services, the Consultant agrees to furnish a building design and associated construction specification that conform to a building code standard that provides a level of seismic safety substantially equivalent to standards as established by the National Earthquake Hazards Reduction Program (NEHRP). Local building codes that model their building code after the current version of the International Building Code (IBC) meet the NEHRP equivalency level for seismic safety. At the conclusion of the design services, the Consultant agrees to furnish the Owner a “certification of compliance” that attests conformance of the building design and the construction specifications with the seismic standards of NEHRP or an equivalent building code.

#### **A23.3.2 Construction Contracts**

##### **SEISMIC SAFETY**

The Contractor agrees to ensure that all work performed under this contract, including work performed by subcontractors, conforms to a building code standard that provides a level of seismic safety substantially equivalent to standards established by the National Earthquake Hazards Reduction

Program (NEHRP). Local building codes that model their code after the current version of the International Building Code (IBC) meet the NEHRP equivalency level for seismic safety.

## **A24 TAX DELINQUENCY AND FELONY CONVICTIONS**

### **A24.1 SOURCE**

Sections 415 and 416 of Title IV, Division L of the Consolidated Appropriations Act, 2014 (Pub. L. 113-76), and similar provisions in subsequent appropriations acts.

DOT Order 4200.6 - Requirements for Procurement and Non-Procurement Regarding Tax Delinquency and Felony Convictions

### **A24.2 APPLICABILITY**

The sponsor must ensure that no funding goes to any contractor who:

- Has been convicted of a Federal felony within the last 24 months; or
- Has any outstanding tax liability for which all judicial and administrative remedies have lapsed or been exhausted.

**Contract Types** – This provision applies to all contracts funded in whole or part with AIP.

**Use of Provision** – The following language is acceptable to the FAA and meets the intent of this requirement. If the sponsor uses different language, the sponsor’s language must fully satisfy the requirements of DOT Order 4200.6.

### **A24.3 CONTRACT CLAUSE**

#### **CERTIFICATION OF OFFERER/BIDDER REGARDING TAX DELINQUENCY AND FELONY CONVICTIONS**

The applicant must complete the following two certification statements. The applicant must indicate its current status as it relates to tax delinquency and felony conviction by inserting a checkmark (✓) in the space following the applicable response. The applicant agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification in all lower tier subcontracts.

#### **Certifications**

- 1) The applicant represents that it is (  ) is not (  ) a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.
- 2) The applicant represents that it is (  ) is not (  ) is not a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months.

#### **Note**

If an applicant responds in the affirmative to either of the above representations, the applicant is ineligible to receive an award unless the sponsor has received notification from the agency suspension and debarment official (SDO) that the SDO has considered suspension or debarment and determined that further action is not required to protect the Government’s interests. The applicant therefore must provide information to the owner about its tax liability or conviction to the Owner, who will then notify

the FAA Airports District Office, which will then notify the agency's SDO to facilitate completion of the required considerations before award decisions are made.

### **Term Definitions**

**Felony conviction:** Felony conviction means a conviction within the preceding twentyfour (24) months of a felony criminal violation under any Federal law and includes conviction of an offense defined in a section of the U.S. code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 U.S.C. § 3559.

**Tax Delinquency:** A tax delinquency is any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

## **A25 TERMINATION OF CONTRACT**

### **A25.1 SOURCE**

2 CFR § 200 Appendix II(B)

FAA Advisory Circular 150/5370-10, Section 80-09

### **A25.2 APPLICABILITY**

**Contract Types** – All contracts and subcontracts in excess of \$10,000 must address *termination for cause* and *termination for convenience* by the sponsor. The provision must address the manner (i.e. notice, opportunity to cure, and effective date) by which the sponsor’s contract will be affected and the basis for settlement (i.e. incurred expenses, completed work, profit, etc.).

#### **Use of Provision –**

*Termination for Default* – **MANDATORY TEXT.** Section 80-09 of FAA Advisory Circular 150/5370-10 establishes standard language for Termination for Default under a construction contract. The sponsor must not make any changes to this standard language.

*Termination for Convenience* – No mandatory text provided. The sponsor must include a clause for termination for convenience. The following language is acceptable to the FAA and meets the intent of this requirement. If the sponsor uses different language, the sponsor’s language must fully satisfy the requirements of Appendix II to 2 CFR part 200.

*Equipment, Professional Services, and Property* – No mandatory text provided. The sponsor may use their established clause language provided that it adequately addresses the intent of Appendix II(B) to Part 200, which addresses termination for fault and for convenience.

### **A25.3 CONTRACT CLAUSE**

#### **A25.3.1 Termination for Convenience**

#### **TERMINATION FOR CONVENIENCE (CONSTRUCTION & EQUIPMENT CONTRACTS)**

The Owner may terminate this contract in whole or in part at any time by providing written notice to the Contractor. Such action may be without cause and without prejudice to any other right or remedy of Owner. Upon receipt of a written notice of termination, except as explicitly directed by the Owner, the Contractor shall immediately proceed with the following obligations regardless of any delay in determining or adjusting amounts due under this clause:

1. Contractor must immediately discontinue work as specified in the written notice.
2. Terminate all subcontracts to the extent they relate to the work terminated under the notice.
3. Discontinue orders for materials and services except as directed by the written notice.
4. Deliver to the Owner all fabricated and partially fabricated parts, completed and partially completed work, supplies, equipment and materials acquired prior to termination of the work, and as directed in the written notice.

5. Complete performance of the work not terminated by the notice.
6. Take action as directed by the Owner to protect and preserve property and work related to this contract that Owner will take possession.

Owner agrees to pay Contractor for:

- 1) completed and acceptable work executed in accordance with the contract documents prior to the effective date of termination;
- 2) documented expenses sustained prior to the effective date of termination in performing work and furnishing labor, materials, or equipment as required by the contract documents in connection with uncompleted work;
- 3) reasonable and substantiated claims, costs, and damages incurred in settlement of terminated contracts with Subcontractors and Suppliers; and
- 4) reasonable and substantiated expenses to the Contractor directly attributable to Owner's termination action.

Owner will not pay Contractor for loss of anticipated profits or revenue or other economic loss arising out of or resulting from the Owner's termination action.

The rights and remedies this clause provides are in addition to any other rights and remedies provided by law or under this contract.

#### **TERMINATION FOR CONVENIENCE (PROFESSIONAL SERVICES)**

The Owner may, by written notice to the Consultant, terminate this Agreement for its convenience and without cause or default on the part of Consultant. Upon receipt of the notice of termination, except as explicitly directed by the Owner, the Contractor must immediately discontinue all services affected.

Upon termination of the Agreement, the Consultant must deliver to the Owner all data, surveys, models, drawings, specifications, reports, maps, photographs, estimates, summaries, and other documents and materials prepared by the Engineer under this contract, whether complete or partially complete.

Owner agrees to make just and equitable compensation to the Consultant for satisfactory work completed up through the date the Consultant receives the termination notice. Compensation will not include anticipated profit on non-performed services.

Owner further agrees to hold Consultant harmless for errors or omissions in documents that are incomplete as a result of the termination action under this clause.

#### **A25.3.2 Termination for Default**

##### **TERMINATION FOR DEFAULT (CONSTRUCTION)**

Section 80-09 of FAA Advisory Circular 150/5370-10 establishes conditions, rights, and remedies associated with Owner termination of this contract due to default of the Contractor.

##### **TERMINATION FOR DEFAULT (EQUIPMENT)**

The Owner may, by written notice of default to the Contractor, terminate all or part of this Contract if the Contractor:

1. Fails to commence the Work under the Contract within the time specified in the Notice- to- Proceed;
2. Fails to make adequate progress as to endanger performance of this Contract in accordance with its terms;
3. Fails to make delivery of the equipment within the time specified in the Contract, including any Owner approved extensions;
4. Fails to comply with material provisions of the Contract;
5. Submits certifications made under the Contract and as part of their proposal that include false or fraudulent statements; or
6. Becomes insolvent or declares bankruptcy.

If one or more of the stated events occur, the Owner will give notice in writing to the Contractor and Surety of its intent to terminate the contract for cause. At the Owner's discretion, the notice may allow the Contractor and Surety an opportunity to cure the breach or default.

If within [10] days of the receipt of notice, the Contractor or Surety fails to remedy the breach or default to the satisfaction of the Owner, the Owner has authority to acquire equipment by other procurement action. The Contractor will be liable to the Owner for any excess costs the Owner incurs for acquiring such similar equipment.

Payment for completed equipment delivered to and accepted by the Owner shall be at the Contract price. The Owner may withhold from amounts otherwise due the Contractor for such completed equipment, such sum as the Owner determines to be necessary to protect the Owner against loss because of Contractor default.

Owner will not terminate the Contractor's right to proceed with the Work under this clause if the delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such acceptable causes include: acts of God, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, and severe weather events that substantially exceed normal conditions for the location.

If, after termination of the Contractor's right to proceed, the Owner determines that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the Owner issued the termination for the convenience the Owner.

The rights and remedies of the Owner in this clause are in addition to any other rights and remedies provided by law or under this contract.

#### **TERMINATION FOR DEFAULT (PROFESSIONAL SERVICES)**

Either party may terminate this Agreement for cause if the other party fails to fulfill its obligations that are essential to the completion of the work per the terms and conditions of the Agreement. The party initiating the termination action must allow the breaching party an opportunity to dispute or cure the breach.

The terminating party must provide the breaching party [7] days advance written notice of its intent to terminate the Agreement. The notice must specify the nature and extent of the breach, the conditions

necessary to cure the breach, and the effective date of the termination action. The rights and remedies in this clause are in addition to any other rights and remedies provided by law or under this agreement.

- a) **Termination by Owner:** The Owner may terminate this Agreement in whole or in part, for the failure of the Consultant to:
1. Perform the services within the time specified in this contract or by Owner approved extension;
  2. Make adequate progress so as to endanger satisfactory performance of the Project; or
  3. Fulfill the obligations of the Agreement that are essential to the completion of the Project.

Upon receipt of the notice of termination, the Consultant must immediately discontinue all services affected unless the notice directs otherwise. Upon termination of the Agreement, the Consultant must deliver to the Owner all data, surveys, models, drawings, specifications, reports, maps, photographs, estimates, summaries, and other documents and materials prepared by the Engineer under this contract, whether complete or partially complete.

Owner agrees to make just and equitable compensation to the Consultant for satisfactory work completed up through the date the Consultant receives the termination notice. Compensation will not include anticipated profit on non-performed services.

Owner further agrees to hold Consultant harmless for errors or omissions in documents that are incomplete as a result of the termination action under this clause.

If, after finalization of the termination action, the Owner determines the Consultant was not in default of the Agreement, the rights and obligations of the parties shall be the same as if the Owner issued the termination for the convenience of the Owner.

- b) **Termination by Consultant:** The Consultant may terminate this Agreement in whole or in part, if the Owner:
1. Defaults on its obligations under this Agreement;
  2. Fails to make payment to the Consultant in accordance with the terms of this Agreement;
  3. Suspends the Project for more than [180] days due to reasons beyond the control of the Consultant.

Upon receipt of a notice of termination from the Consultant, Owner agrees to cooperate with Consultant for the purpose of terminating the agreement or portion thereof, by mutual consent. If Owner and Consultant cannot reach mutual agreement on the termination settlement, the Consultant may, without prejudice to any rights and remedies it may have, proceed with terminating all or parts of this Agreement based upon the Owner's breach of the contract.

In the event of termination due to Owner breach, the Engineer is entitled to invoice Owner and to receive full payment for all services performed or furnished in accordance with this Agreement and all justified reimbursable expenses incurred by the Consultant through the effective date of termination action. Owner agrees to hold Consultant harmless for errors or omissions in documents that are incomplete as a result of the termination action under this clause.

## **A26 TRADE RESTRICTION CERTIFICATION**

### **A26.1 SOURCE**

49 USC § 50104

49 CFR part 30

### **A26.2 APPLICABILITY**

Unless waived by the Secretary of Transportation, sponsors may not use AIP funds on a product or service from a foreign country included in the current list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (USTR).

**Contract Types** – The trade restriction certification and clause applies to all AIP funded projects.

**Use of Provision – MANDATORY TEXT.** 49 CFR part 30 prescribes the language for this model clause. The sponsor must include this certification language in all contracts and subcontracts without modification.

### **A26.3 SOLICITATION CLAUSE**

#### **TRADE RESTRICTION CERTIFICATION**

By submission of an offer, the Offeror certifies that with respect to this solicitation and any resultant contract, the Offeror –

- 1) is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (USTR);
- 2) has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country included on the list of countries that discriminate against U.S. firms as published by the USTR; and
- 3) has not entered into any subcontract for any product to be used on the Federal project that is produced in a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18 USC Section 1001.

The Offeror/Contractor must provide immediate written notice to the Owner if the Offeror/Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The Contractor must require subcontractors provide immediate written notice to the Contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to an Offeror or subcontractor:

- 1) who is owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR or
- 2) whose subcontractors are owned or controlled by one or more citizens or nationals of a foreign country on such USTR list or
- 3) who incorporates in the public works project any product of a foreign country on such USTR list.

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

The Offeror agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in all lower tier subcontracts. The Contractor may rely on the certification of a prospective subcontractor that it is not a firm from a foreign country included on the list of countries that discriminate against U.S. firms as published by USTR, unless the Offeror has knowledge that the certification is erroneous.

This certification is a material representation of fact upon which reliance was placed when making an award. If it is later determined that the Contractor or subcontractor knowingly rendered an erroneous certification, the Federal Aviation Administration (FAA) may direct through the Owner cancellation of the contract or subcontract for default at no cost to the Owner or the FAA.

## **A27 VETERAN'S PREFERENCE**

### **A27.1 SOURCE**

49 USC § 47112(c)

### **A27.2 APPLICABILITY**

**Contract Types** – This provision applies to all AIP funded projects that involve labor to carry out the project. This preference, which excludes executive, administrative, and supervisory positions, applies to covered veterans (as defined under § 47112(c)) only when they are readily available and qualified to accomplish the work required by the project.

**Use of Provision** – No mandatory text provided. The following language is acceptable to the FAA and meets the intent of this requirement. If the sponsor uses different language, the sponsor's language must fully satisfy the requirements of 49 USC § 47112.

### **A27.3 CONTRACT CLAUSE**

#### **VETERAN'S PREFERENCE**

In the employment of labor (excluding executive, administrative, and supervisory positions), the Contractor and all sub-tier contractors must give preference to covered veterans as defined within Title 49 United States Code Section 47112. Covered veterans include Vietnam-era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns (as defined by 15 USC 632) owned and controlled by disabled veterans. This preference only applies when there are covered veterans readily available and qualified to perform the work to which the employment relates.

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
**FEDERAL CERTIFICATIONS**

- A4 - Buy American Preference - Title 49 U.S.C., § 501101
- A11 - Suspension and Debarment Requirement For All Contracts Over \$25,000 – 2 CFR part 180 (Subpart C), 2 CFR part 1200, DOT Order 4200.5
- A12 - Disadvantaged Business Enterprise Participation – 49 CFR part 26
- A16 - Bidder's Statement On Previous Contracts Subject To EEO Clause – 2 CFR 200, Appendix II(C), 41 CFR § 60-1.4, 41 CFR § 60-4.3, Executive Order 11246
- A18 – Lobbying and Influencing Federal Employees – 31 USC § 1352 Byrd Anti-Lobbying Amendment, 2 CFR part 200, Appendix II(J), 49 CFR part 20, Appendix A
- A19 – Prohibition of Segregated Facilities – 41 CFR § 60
- A26 - Trade Restriction Certification – 49 USC § 50104, 49 CFR part 30

# A4 - CERTIFICATE OF BUY AMERICAN COMPLIANCE- MANUFACTURED PRODUCTS

## PULLIAM AIRPORT FLAGSTAFF, ARIZONA

As a matter of bid responsiveness, the bidder or offeror must complete, sign, date, and submit this certification statement with their proposal. The bidder or offeror must indicate how they intend to comply with 49 USC § 50101 by selecting one on the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (not both) by inserting a checkmark (✓) or the letter "X".

- Bidder or offeror hereby certifies that it will comply with 49 USC § 50101 by:
- a) Only installing steel and manufactured products produced in the United States;
  - b) Installing manufactured products for which the Federal Aviation Administration (FAA) has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing; or
  - c) Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder or offeror agrees:

1. To provide to the Owner evidence that documents the source and origin of the steel and manufactured product.
2. To faithfully comply with providing U.S. domestic product.
3. To furnish U.S. domestic product for any waiver request that the FAA rejects
4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

- The bidder or offeror hereby certifies it cannot comply with the 100 percent Buy American Preferences of 49 USC § 50101(a) but may qualify for either a Type 3 or Type 4 waiver under 49 USC § 50101(b). By selecting this certification statement, the apparent bidder or offeror with the apparent low bid agrees:

1. To submit to the Owner within 15 calendar days of the bid opening, a formal waiver request and required documentation that supports the type of waiver being requested.
2. That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination may result in rejection of the proposal.
3. To faithfully comply with providing U.S. domestic products at or above the approved U.S. domestic content percentage as approved by the FAA.
4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

### Required Documentation

**Type 3 Waiver** – The cost of the item components and subcomponents produced in the United States is more than 60 percent of the cost of all components and subcomponents of the "item". The required documentation for a Type 3 waiver is:

- a) Listing of all product components and subcomponents that are not comprised of 100 percent U.S. domestic content (Excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety).

- b) Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly at place of manufacture.
- c) Percentage of non-domestic component and subcomponent cost as compared to total "item" component and subcomponent costs, excluding labor costs associated with final assembly at place of manufacture.

**Type 4 Waiver** – Total cost of project using U.S. domestic source product exceeds the total project cost using non-domestic product by 25 percent. The required documentation for a Type 4 of waiver is:

- a) Detailed cost information for total project using U.S. domestic product
- b) Detailed cost information for total project using non-domestic product

**False Statements:** Per 49 USC § 47126, this certification concerns a matter within the jurisdiction of the Federal Aviation Administration and the making of a false, fictitious or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Company Name

\_\_\_\_\_

Title

**NOTE: Failure to complete the blanks may be grounds for rejection of the bid.**

# A11 - CERTIFICATION OF LOWER TIER CONTRACTORS REGRAIDING DEBAREMENT

## PULLIAM AIRPORT FLAGSTAFF, ARIZONA

The successful bidder, by administering each lower tier subcontract that exceeds \$25,000 as a "covered transaction", must verify each lower tier participant of a "covered transaction" under the project is not presently debarred or otherwise disqualified from participation in this federally assisted project. The successful bidder will accomplish this by:

1. Checking the System for Award Management at website: <http://www.sam.gov>.
2. Collecting a certification statement similar to the Certification of Offerer /Bidder Regarding Debarment, above.
3. Inserting a clause or condition in the covered transaction with the lower tier contract.

If the Federal Aviation Administration later determines that a lower tier participant failed to disclose to a higher tier participant that it was excluded or disqualified at the time it entered the covered transaction, the FAA may pursue any available remedies, including suspension and debarment of the non-compliant participant.

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Company Name

\_\_\_\_\_

Title

**NOTE: Failure to complete the blanks may be grounds for rejection of the bid.**

# A12 - ASSURANCE OF DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION

## PULLIAM AIRPORT FLAGSTAFF, ARIZONA

To meet the mandated requirements of the United States Department of Transportation, 49 CFR Part 26, the assurance below shall be signed by the bidder and submitted with the bid.

### **BIDDER'S ASSURANCE OF COMPLIANCE WITH TITLE 49 CFR PART 26 RELATING TO DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION**

The successful Bidder or Offeror must provide written confirmation of participation from each of the DBE firms the Bidder or Offeror lists in its commitment **within five days after bid opening**.

- 1) The names and addresses of Disadvantaged Business Enterprise (DBE) firms that will participate in the contract;
- 2) A description of the work that each DBE firm will perform;
- 3) The dollar amount of the participation of each DBE firm listed under (1)
- 4) Written statement from Bidder or Offeror that attests their commitment to use the DBE firm(s) listed under (1) to meet the Owner's project goal; and
- 5) If Bidder or Offeror cannot meet the advertised project DBE goal, evidence of good faith efforts undertaken by the Bidder or Offeror as described in appendix A to 49 CFR part 26.

The requirements of 49 CFR part 26 apply to this contract. It is the policy of the City of Flagstaff to practice nondiscrimination based on race, color, sex, or national origin in the award or performance of this contract. The Owner encourages participation by all firms qualifying under this solicitation regardless of business size or ownership.

The Contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of Department of Transportation-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Owner deems appropriate, which may include, but is not limited to:

- 1) Withholding monthly progress payments;
- 2) Assessing sanctions;
- 3) Liquidated damages; and/or
- 4) Disqualifying the Contractor from future bidding as non-responsible.

**Prompt Payment (§26.29)** – The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than seven (7) days from the receipt of each payment the prime contractor receives from City of Flagstaff. The prime contractor agrees further to return retainage payments to each subcontractor within seven (7) days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the City of Flagstaff. This clause applies to both DBE and non-DBE subcontractors.

The bidder hereby gives assurance pursuant to the requirements of Title 49 CFR Part 26 that bidder has made a reasonable effort to meet the goals for Disadvantaged Business Enterprise participation specified for the contract for which this proposal is submitted and that bidder, if the contract is awarded to bidder, will have a **DBE participation of [REDACTED] percent of the amount of this bid**. Bidder further gives

assurance that bidder has submitted the documentation required by said Regulations and the contract specifications, including the Listing of Disadvantaged Business Enterprises with which the bidder will subcontract if the contract is awarded and if bidder is unable to meet the contract goals for DBE participation, and the steps bidder has taken to obtain DBE participation.

**The DBE Participation goal for this project is 1.89% Race Neutral**

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Company Name

\_\_\_\_\_

Title

**NOTE: Bidder shall insert the percentage for DBE participation even if the percentage is less than the contract goal. A bid that fails to meet these requirements may be considered grounds for rejecting the bid.**

# **A16 - BIDDER'S STATEMENT ON PREVIOUS CONTRACTS SUBJECT TO EEO CLAUSE**

## **PULLIAM AIRPORT FLAGSTAFF, ARIZONA**

During the performance of this contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identify, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff, or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.

(3) The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: *Provided, however,* that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

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Date

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Signature

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Company Name

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Title

**NOTE: Failure to complete the blanks may be grounds for rejection of the bid.**

# A18 – LOBBYING AND INFLUENCING FEDERAL EMPLOYEES

## PULLIAM AIRPORT FLAGSTAFF, ARIZONA

The Bidder or Offeror certifies by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Bidder or Offeror, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Title

**NOTE: Failure to complete the blanks may be grounds for rejection of the bid.**

**A19 - CERTIFICATION PROHIBICION OF SEGREGATED FACILITIES (CONTRACTORS/SUBCONTRACTORS)**

**PULLIAM AIRPORT  
FLAGSTAFF, ARIZONA**

(a) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Employment Opportunity clause in this contract.

(b) "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Employment Opportunity clause of this contract.

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Company Name

\_\_\_\_\_

Title

**NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.**

# **A26 - TRADE RESTRICTION CERTIFICATE TO BE INCLUDED IN ALL SOLICITATIONS, CONTRACTS, AND SUBCONTRACTS**

## **PULLIAM AIRPORT FLAGSTAFF, ARIZONA**

By submission of an offer, the Offeror certifies that with respect to this solicitation and any resultant contract, the Offeror –

- 1) is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (USTR);
- 2) has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country included on the list of countries that discriminate against U.S. firms as published by the USTR; and
- 3) has not entered into any subcontract for any product to be used on the Federal project that is produced in a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18 USC Section 1001.

The Offeror/Contractor must provide immediate written notice to the Owner if the Offeror/Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The Contractor must require subcontractors provide immediate written notice to the Contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to an Offeror or subcontractor:

- 1) who is owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR or
- 2) whose subcontractors are owned or controlled by one or more citizens or nationals of a foreign country on such USTR list or
- 3) who incorporates in the public works project any product of a foreign country on such USTR list.

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

The Offeror agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in all lower tier subcontracts. The Contractor may rely on the certification of a prospective subcontractor that it is not a firm from a foreign country included on the list of countries that discriminate against U.S. firms as published by USTR, unless the Offeror has knowledge that the certification is erroneous.

This certification is a material representation of fact upon which reliance was placed when making an award. If it is later determined that the Contractor or subcontractor knowingly rendered an erroneous certification, the

Federal Aviation Administration (FAA) may direct through the Owner cancellation of the contract or subcontract for default at no cost to the Owner or the FAA.

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Company Name

\_\_\_\_\_

Title

**NOTE: Failure to complete the blanks may be grounds for rejection of the bid.**

**DAVIS-BACON AND RELATED ACTS  
REQUIREMENTS  
AND  
WAGE RATE**

## Fact Sheet #66: The Davis-Bacon and Related Acts (DBRA)

This fact sheet provides general information concerning DBRA.

### Coverage

DBRA requires payment of prevailing wages on federally funded or assisted construction projects. The [Davis-Bacon Act](#) applies to each federal government or District of Columbia contract in excess of \$2,000 for the construction, alteration, or repair (including painting and decorating) of [public buildings or public works](#). Many federal laws that authorize federal assistance for construction through grants, loans, loan guarantees, and insurance are Davis-Bacon “related Acts.” The “related Acts” include provisions that require Davis-Bacon labor standards apply to most federally assisted construction. Examples of “related Acts” include the Federal-Aid Highway Acts, the Housing and Community Development Act of 1974, and the Federal Water Pollution Control Act.

### Basic Provisions/Requirements

Contractors and subcontractors must pay [laborers and mechanics employed](#) directly upon the [site of the work](#) at least the locally prevailing wages (including fringe benefits), listed in the Davis-Bacon wage determination in the contract, for the work performed. [Davis-Bacon labor standards clauses](#) must be included in covered contracts.

The Davis-Bacon “prevailing wage” is the combination of the basic hourly rate and any fringe benefits listed in a Davis-Bacon wage determination. The contractor’s obligation to pay at least the prevailing wage listed in the contract wage determination can be met by paying each laborer and mechanic the applicable prevailing wage entirely as cash wages or by a combination of cash wages and employer-provided bona fide fringe benefits. Prevailing wages, including fringe benefits, must be paid on all hours worked on the site of the work.

Apprentices or trainees may be employed at less than the rates listed in the contract wage determination only when they are in an apprenticeship program registered with the Department of Labor or with a state apprenticeship agency recognized by the Department.

Contractors and subcontractors are required to pay covered workers weekly and submit weekly certified payroll records to the contracting agency. They are also required to post the applicable Davis-Bacon wage determination with the [Davis-Bacon poster \(WH-1321\)](#) on the job site in a prominent and accessible place where they can be easily seen by the workers.

### Davis-Bacon Wage Determinations

Davis-Bacon wage determinations are published on the Wage Determinations On Line ([WDOL](#)) website for contracting agencies to incorporate them into covered contracts. The “prevailing wages” are determined based on wages paid to various classes of laborers and mechanics employed on specific types of construction projects in an area. Guidance on determining the type of construction is provided in All Agency Memoranda [Nos. 130](#) and [131](#).

## **Penalties/Sanctions and Appeals**

Contract payments may be withheld in sufficient amounts to satisfy liabilities for underpayment of wages and for liquidated damages for overtime violations under the Contract Work Hours and Safety Standards Act (CWHSSA). In addition, violations of the Davis-Bacon contract clauses may be grounds for contract termination, contractor liability for any resulting costs to the government and debarment from future contracts for a period up to three years.

Contractors and subcontractors may challenge determinations of violations and debarment before an Administrative Law Judge (ALJ). Interested parties may appeal ALJ decisions to the Department's Administrative Review Board. Final Board determinations on violations and debarment may be appealed to and are enforceable through the federal courts.

## **Typical Problems**

(1) Misclassification of laborers and mechanics. (2) Failure to pay full prevailing wage, including fringe benefits, for all hours worked (including overtime hours). (3) Inadequate recordkeeping, such as not counting all hours worked or not recording hours worked by an individual in two or more classifications during a day. (4) Failure of to maintain a copy of bona fide apprenticeship program and individual registration documents for apprentices. (5) Failure to submit certified payrolls weekly. (6) Failure to post the Davis-Bacon poster and applicable wage determination.

## **Relation to State, Local, and Other Federal Laws**

The [Copeland "Anti-Kickback" Act](#) prohibits contractors from in any way inducing an employee to give up any part of the compensation to which he or she is entitled under his or her contract of employment, and requires contractors to submit a weekly statement of the wages paid to each employee performing DBRA covered work.

Contractors on projects subject to DBRA labor standards may also be subject to additional prevailing wage and overtime pay requirements under State (and local) laws. Also, overtime work pay requirements under CWHSSA) and the [Fair Labor Standards Act](#) may apply.

Under [Reorganization Plan No. 14 of 1950](#), (5 U.S.C.A. Appendix), the federal contracting or assistance-administering agencies have day-to-day responsibility for administration and enforcement of the Davis-Bacon labor standards provisions and, in order to promote consistent and effective enforcement, the Department of Labor has regulatory and oversight authority, including the authority to investigate compliance.

## **Where to Obtain Additional Information**

**For additional information, visit our Wage and Hour Division Website: <http://www.wagehour.dol.gov> and/or call our toll-free information and helpline, available 8 a.m. to 5 p.m. in your time zone, 1-866-4USWAGE (1-866-487-9243).**

This publication is for general information and is not to be considered in the same light as official statements of position contained in the regulations.

**U.S. Department of Labor**  
Frances Perkins Building  
200 Constitution Avenue, NW  
Washington, DC 20210

**1-866-4-USWAGE**  
TTY: 1-866-487-9243  
[Contact Us](#)





# Wage and Hour Division (WHD)

## Instructions For Completing Payroll Form, WH-347

[WH-347](#) (PDF)

OMB Control No. 1235-0008, Expires 02/28/2018.

**General:** Form WH-347 has been made available for the convenience of contractors and subcontractors required by their Federal or Federally-aided construction-type contracts and subcontracts to submit weekly payrolls. Properly filled out, this form will satisfy the requirements of Regulations, Parts 3 and 5 (29 C.F.R., Subtitle A), as to payrolls submitted in connection with contracts subject to the Davis-Bacon and related Acts.

While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) requires contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) Regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

Under the Davis-Bacon and related Acts, the contractor is required to pay not less than prevailing wage, including fringe benefits, as predetermined by the Department of Labor. The contractor's obligation to pay fringe benefits may be met either by payment of the fringe benefits to bona fide benefit plans, funds or programs or by making payments to the covered workers (laborers and mechanics) as cash in lieu of fringe benefits.

This payroll provides for the contractor to show on the face of the payroll all monies to each worker, whether as basic rates or as cash in lieu of fringe benefits, and provides for the contractor's representation in the statement of compliance on the payroll (as shown on page 2) that he/she is paying for fringe benefits required by the contract and not paid as cash in lieu of fringe benefits. Detailed instructions concerning the preparation of the payroll follow:

**Contractor or Subcontractor:** Fill in your firm's name and check appropriate box.

**Address:** Fill in your firm's address.

**Payroll No.:** Beginning with the number "1", list the payroll number for the submission.

**For Week Ending:** List the workweek ending date.

**Project and Location:** Self-explanatory.

**Project or Contract No.:** Self-explanatory.

**Column 1 - Name and Individual Identifying Number of Worker:** Enter each worker's full name and an individual identifying number (e.g., last four digits of worker's social security number) on each weekly payroll submitted.

**Column 2 - No. of Withholding Exemptions:** This column is merely inserted for the employer's convenience and is not a requirement of Regulations, Part 3 and 5.

**Column 3 - Work Classifications:** List classification descriptive of work actually performed by each laborer or mechanic. Consult classification and minimum wage schedule set forth in contract specifications. If additional classifications are deemed necessary, see Contracting Officer or Agency representative. An individual may be shown as having worked in more than one classification provided an accurate breakdown or hours worked in each classification is maintained and shown on the submitted payroll by use of separate entries.

**Column 4 - Hours worked:** List the day and date and straight time and overtime hours worked in the applicable boxes. On all contracts subject to the Contract Work Hours Standard Act, enter hours worked in excess of 40 hours a week as "overtime".

**Column 5 - Total:** Self-explanatory

**Column 6 - Rate of Pay (Including Fringe Benefits):** In the "straight time" box for each worker, list the actual hourly rate paid for straight time worked, plus cash paid in lieu of fringe benefits paid. When recording the straight time hourly rate, any cash paid in lieu of fringe benefits may be shown separately from the basic rate. For example, "\$12.25/.40" would reflect a \$12.25 base hourly rate plus \$0.40 for fringe benefits. This is of assistance in correctly computing overtime. See "Fringe Benefits" below. When overtime is worked, show the overtime hourly rate paid plus any cash in lieu of fringe benefits paid in the "overtime" box for each worker; otherwise, you may skip this box. See "Fringe Benefits" below. Payment of not less than time and one-half the basic or regular rate paid is required for overtime under the Contract Work Hours Standard Act of 1962 if the prime contract exceeds \$100,000. In addition to paying no less than the predetermined rate for the classification which an individual works, the contractor must pay amounts predetermined as fringe benefits in the wage decision made part of the contract to approved fringe benefit plans, funds or programs or shall pay as cash in lieu of fringe benefits. See "FRINGE BENEFITS" below.

**Column 7 - Gross Amount Earned:** Enter gross amount earned on this project. If part of a worker's weekly wage was earned on projects other than the project described on this payroll, enter in column 7 first the amount earned on the Federal or Federally assisted project and then the gross amount earned during the week on all projects, thus "\$163.00/\$420.00" would reflect the earnings of a worker who earned \$163.00 on a Federally assisted construction project during a week in which \$420.00 was earned on all work.

**Column 8 - Deductions:** Five columns are provided for showing deductions made. If more than five deduction are involved, use the first four columns and show the balance deductions under "Other" column; show actual total under "Total Deductions" column; and in the attachment to the payroll describe the deduction(s) contained in the "Other" column. All deductions must be in accordance with the provisions of the Copeland Act Regulations, 29 C.F.R., Part 3. If an individual worked on other jobs in addition to this project, show actual deductions from his/her weekly gross wage, and indicate that deductions are based on his gross wages.

**Column 9 - Net Wages Paid for Week:** Self-explanatory.

**Totals** - Space has been left at the bottom of the columns so that totals may be shown if the contractor so desires.

**Statement Required by Regulations, Parts 3 and 5:** While the "statement of compliance" need not be notarized, the statement (on page 2 of the payroll form) is subject to the penalties provided by 18 U.S.C. § 1001, namely, a fine, possible imprisonment of not more than 5 years, or both. Accordingly, the party signing this statement should have knowledge of the facts represented as true.

**Items 1 and 2:** Space has been provided between items (1) and (2) of the statement for describing any deductions made. If all deductions made are adequately described in the "Deductions" column above, state "See Deductions column in this payroll." See "FRINGE BENEFITS" below for instructions concerning filling out paragraph 4 of the statement.

**Item 4 FRINGE BENEFITS - Contractors who pay all required fringe benefits:** If paying all fringe benefits to approved plans, funds, or programs in amounts not less than were determined in the applicable wage decision of the Secretary of Labor, show the basic cash hourly rate and overtime rate paid to each worker on the face of the payroll and check paragraph 4(a) of the statement on page 2 of the WH-347 payroll form to indicate the payment. Note any exceptions in section 4(c).

**Contractors who pay no fringe benefits:** If not paying all fringe benefits to approved plans, funds, or programs in amounts of at least those that were determined in the applicable wage decision of the Secretary of Labor, pay any remaining fringe benefit amount to each laborer and mechanic and insert in the "straight time" of the "Rate of Pay" column of the payroll an amount not less than the predetermined rate for each classification plus the amount of fringe benefits determined for each classification in the application wage decision. Inasmuch as it is not necessary to pay time and a half on cash paid in lieu of fringe benefits, the overtime rate shall be not less than the sum of the basic predetermined rate, plus the half time premium on basic or regular rate, plus the required cash in lieu of fringe benefits at the straight time rate. In addition, check paragraph 4(b) of the statement on page 2 the payroll form to indicate the payment of fringe benefits in cash directly to the workers. Note any exceptions in section 4(c).

## Use of Section 4(c), Exceptions

Any contractor who is making payment to approved plans, funds, or programs in amounts less than the wage determination requires is obliged to pay the deficiency directly to the covered worker as cash in lieu of fringe benefits. Enter any exceptions to section 4(a) or 4(b) in section 4(c). Enter in the Exception column the craft, and enter in the Explanation column the hourly amount paid each worker as cash in lieu of fringe benefits and the hourly amount paid to plans, funds, or programs as fringe benefits. The contractor must pay an amount not less than the predetermined rate plus cash in lieu of fringe benefits as shown in section 4(c) to each such individual for all hours worked (unless otherwise provided by applicable wage determination) on the Federal or Federally assisted project. Enter the rate paid and amount of cash paid in lieu of fringe benefits per hour in column 6 on the payroll. See paragraph on "Contractors who pay no fringe benefits" for computation of overtime rate.

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**Public Burden Statement:** We estimate that it will take an average of 55 minutes to complete this collection of information, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection of information, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, ESA, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W., Washington, D.C. 20210.

**Note:** In order to view, fill out, and print PDF forms, you need Adobe® Acrobat® Reader® version 5 or later, which you may download for free at [www.adobe.com/products/acrobat/readstep2.html](http://www.adobe.com/products/acrobat/readstep2.html). To save the completed forms on your workstation, you need to use the "Save As" method to save the file.

For example, move your mouse cursor over the PDF link and click on your "RIGHT" mouse button. This will cause a menu to be displayed, from which you will select the proper save option -- depending upon which browser you are using:

For Microsoft IE users, select "Save Target As"

For Netscape Navigator users, select "Save Link As"

Once you've selected the proper save option for your browser, and have saved the file to a location you specified, go to your program menu and start the Adobe Acrobat® Reader. Once open, locate the PDF file you saved and open it directly in Acrobat®.

# EMPLOYEE RIGHTS

## UNDER THE DAVIS-BACON ACT

### FOR LABORERS AND MECHANICS EMPLOYED ON FEDERAL OR FEDERALLY ASSISTED CONSTRUCTION PROJECTS

#### PREVAILING WAGES

You must be paid not less than the wage rate listed in the Davis-Bacon Wage Decision posted with this Notice for the work you perform.

#### OVERTIME

You must be paid not less than one and one-half times your basic rate of pay for all hours worked over 40 in a work week. There are few exceptions.

#### ENFORCEMENT

Contract payments can be withheld to ensure workers receive wages and overtime pay due, and liquidated damages may apply if overtime pay requirements are not met. Davis-Bacon contract clauses allow contract termination and debarment of contractors from future federal contracts for up to three years. A contractor who falsifies certified payroll records or induces wage kickbacks may be subject to civil or criminal prosecution, fines and/or imprisonment.

#### APPRENTICES

Apprentice rates apply only to apprentices properly registered under approved Federal or State apprenticeship programs.

#### PROPER PAY

If you do not receive proper pay, or require further information on the applicable wages, contact the Contracting Officer listed below:

or contact the U.S. Department of Labor's Wage and Hour Division.



WAGE AND HOUR DIVISION  
UNITED STATES DEPARTMENT OF LABOR

1-866-487-9243  
TTY: 1-877-889-5627  
[www.dol.gov/whd](http://www.dol.gov/whd)



# Equal Employment Opportunity is **THE LAW**

## **Private Employers, State and Local Governments, Educational Institutions, Employment Agencies and Labor Organizations**

Applicants to and employees of most private employers, state and local governments, educational institutions, employment agencies and labor organizations are protected under Federal law from discrimination on the following bases:

### **RACE, COLOR, RELIGION, SEX, NATIONAL ORIGIN**

Title VII of the Civil Rights Act of 1964, as amended, protects applicants and employees from discrimination in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment, on the basis of race, color, religion, sex (including pregnancy), or national origin. Religious discrimination includes failing to reasonably accommodate an employee's religious practices where the accommodation does not impose undue hardship.

### **DISABILITY**

Title I and Title V of the Americans with Disabilities Act of 1990, as amended, protect qualified individuals from discrimination on the basis of disability in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment. Disability discrimination includes not making reasonable accommodation to the known physical or mental limitations of an otherwise qualified individual with a disability who is an applicant or employee, barring undue hardship.

### **AGE**

The Age Discrimination in Employment Act of 1967, as amended, protects applicants and employees 40 years of age or older from discrimination based on age in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment.

### **SEX (WAGES)**

In addition to sex discrimination prohibited by Title VII of the Civil Rights Act, as amended, the Equal Pay Act of 1963, as amended, prohibits sex discrimination in the payment of wages to women and men performing substantially equal work, in jobs that require equal skill, effort, and responsibility, under similar working conditions, in the same establishment.

### **GENETICS**

Title II of the Genetic Information Nondiscrimination Act of 2008 protects applicants and employees from discrimination based on genetic information in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment. GINA also restricts employers' acquisition of genetic information and strictly limits disclosure of genetic information. Genetic information includes information about genetic tests of applicants, employees, or their family members; the manifestation of diseases or disorders in family members (family medical history); and requests for or receipt of genetic services by applicants, employees, or their family members.

### **RETALIATION**

All of these Federal laws prohibit covered entities from retaliating against a person who files a charge of discrimination, participates in a discrimination proceeding, or otherwise opposes an unlawful employment practice.

### **WHAT TO DO IF YOU BELIEVE DISCRIMINATION HAS OCCURRED**

There are strict time limits for filing charges of employment discrimination. To preserve the ability of EEOC to act on your behalf and to protect your right to file a private lawsuit, should you ultimately need to, you should contact EEOC promptly when discrimination is suspected:

The U.S. Equal Employment Opportunity Commission (EEOC), 1-800-669-4000 (toll-free) or 1-800-669-6820 (toll-free TTY number for individuals with hearing impairments). EEOC field office information is available at [www.eeoc.gov](http://www.eeoc.gov) or in most telephone directories in the U.S. Government or Federal Government section. Additional information about EEOC, including information about charge filing, is available at [www.eeoc.gov](http://www.eeoc.gov).

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## Employers Holding Federal Contracts or Subcontracts

Applicants to and employees of companies with a Federal government contract or subcontract are protected under Federal law from discrimination on the following bases:

### **RACE, COLOR, RELIGION, SEX, NATIONAL ORIGIN**

Executive Order 11246, as amended, prohibits job discrimination on the basis of race, color, religion, sex or national origin, and requires affirmative action to ensure equality of opportunity in all aspects of employment.

### **INDIVIDUALS WITH DISABILITIES**

Section 503 of the Rehabilitation Act of 1973, as amended, protects qualified individuals from discrimination on the basis of disability in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment. Disability discrimination includes not making reasonable accommodation to the known physical or mental limitations of an otherwise qualified individual with a disability who is an applicant or employee, barring undue hardship. Section 503 also requires that Federal contractors take affirmative action to employ and advance in employment qualified individuals with disabilities at all levels of employment, including the executive level.

### **DISABLED, RECENTLY SEPARATED, OTHER PROTECTED, AND ARMED FORCES SERVICE MEDAL VETERANS**

The Vietnam Era Veterans' Readjustment Assistance Act of 1974, as amended, 38 U.S.C. 4212, prohibits job discrimination and requires affirmative action to employ and advance in employment disabled veterans, recently separated veterans (within

three years of discharge or release from active duty), other protected veterans (veterans who served during a war or in a campaign or expedition for which a campaign badge has been authorized), and Armed Forces service medal veterans (veterans who, while on active duty, participated in a U.S. military operation for which an Armed Forces service medal was awarded).

### **RETALIATION**

Retaliation is prohibited against a person who files a complaint of discrimination, participates in an OFCCP proceeding, or otherwise opposes discrimination under these Federal laws.

Any person who believes a contractor has violated its nondiscrimination or affirmative action obligations under the authorities above should contact immediately:

The Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor, 200 Constitution Avenue, N.W., Washington, D.C. 20210, 1-800-397-6251 (toll-free) or (202) 693-1337 (TTY). OFCCP may also be contacted by e-mail at [OFCCP-Public@dol.gov](mailto:OFCCP-Public@dol.gov), or by calling an OFCCP regional or district office, listed in most telephone directories under U.S. Government, Department of Labor.

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## Programs or Activities Receiving Federal Financial Assistance

### **RACE, COLOR, NATIONAL ORIGIN, SEX**

In addition to the protections of Title VII of the Civil Rights Act of 1964, as amended, Title VI of the Civil Rights Act of 1964, as amended, prohibits discrimination on the basis of race, color or national origin in programs or activities receiving Federal financial assistance. Employment discrimination is covered by Title VI if the primary objective of the financial assistance is provision of employment, or where employment discrimination causes or may cause discrimination in providing services under such programs. Title IX of the Education Amendments of 1972 prohibits employment discrimination on the basis of sex in educational programs or activities which receive Federal financial assistance.

### **INDIVIDUALS WITH DISABILITIES**

Section 504 of the Rehabilitation Act of 1973, as amended, prohibits employment discrimination on the basis of disability in any program or activity which receives Federal financial assistance. Discrimination is prohibited in all aspects of employment against persons with disabilities who, with or without reasonable accommodation, can perform the essential functions of the job.

If you believe you have been discriminated against in a program of any institution which receives Federal financial assistance, you should immediately contact the Federal agency providing such assistance.

# EMPLOYEE RIGHTS UNDER THE FAIR LABOR STANDARDS ACT

## FEDERAL MINIMUM WAGE

# \$7.25

 PER HOUR

BEGINNING JULY 24, 2009

## STATE AND LOCAL GOVERNMENT EMPLOYEES

### OVERTIME PAY

At least 1½ times the regular rate of pay for all hours worked over 40 in a workweek.

Law enforcement and fire protection personnel: You may be paid overtime on the basis of a “work period” of between 7 and 28 consecutive days in length, rather than on a 40-hour workweek basis.

### COMPENSATORY TIME

Employees may receive compensatory time off instead of cash overtime pay, at a rate of not less than 1½ hours for each overtime hour worked, where provided pursuant to an agreement or understanding that meets the requirements of the Act.

### EXEMPTIONS

The Act does not apply to persons who are not subject to the civil service laws of State or local governments and who are: elected public officials, certain immediate advisors to such officials, certain individuals appointed or selected by such officials to serve in various capacities, or employees of legislative branches of State and local governments. Employees of legislative libraries do not come within this exclusion and are thus covered by the Act.

Certain types of workers are exempt from the minimum wage and overtime pay provisions, including bona fide executive, administrative, and professional employees who meet regulatory requirements.

Any law enforcement or fire protection employee who in any workweek is employed by a public agency employing less than 5 employees in law enforcement or fire protection activities is exempt from the overtime pay provisions.

### YOUTH EMPLOYMENT

16 years old is the minimum age for most occupations. An 18-year old minimum applies to hazardous occupations. Minors 14 and 15 years old may work outside school hours under certain conditions. For more information, visit the YouthRules! Web site at [www.youthrules.dol.gov](http://www.youthrules.dol.gov).

### ENFORCEMENT

The Department has authority to recover back wages and an equal amount in liquidated damages in instances of minimum wage, overtime, and other violations. The Department may litigate and/or recommend criminal prosecution. Employers may be assessed civil money penalties for each willful or repeated violation of the minimum wage or overtime pay provisions of the law. Civil money penalties may also be assessed for violations of the FLSA’s child labor provisions. Heightened civil money penalties may be assessed for each child labor violation that results in the death or serious injury of any minor employee, and such assessments may be doubled when the violations are determined to be willful or repeated. The law also prohibits retaliating against or discharging workers who file a complaint or participate in any proceeding under the FLSA.

### ADDITIONAL INFORMATION

- Some state laws provide greater employee protections; employers must comply with both.
- Employees under 20 years of age may be paid a youth minimum wage of not less than \$4.25 an hour during their first 90 consecutive calendar days after initial employment by an employer.
- Employers are required to display this poster where employees can readily see it.

**The law requires employers to display this poster where employees can readily see it.**



WAGE AND HOUR DIVISION  
UNITED STATES DEPARTMENT OF LABOR

1-866-487-9243  
TTY: 1-877-889-5627  
[www.dol.gov/whd](http://www.dol.gov/whd)



"General Decision Number: AZ20240012 01/19/2024

Superseded General Decision Number: AZ20230012

State: Arizona

Construction Type: Residential

Counties: Coconino and Yavapai Counties in Arizona.

EXCLUDING NAVAJO INDIAN RESERVATION

RESIDENTIAL CONSTRUCTION PROJECTS (consisting of single family homes and apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

<p>If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:</p>	<ul style="list-style-type: none"> <li>. Executive Order 14026 generally applies to the contract.</li> <li>. The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024.</li> </ul>
<p>If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:</p>	<ul style="list-style-type: none"> <li>. Executive Order 13658 generally applies to the contract.</li> <li>. The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.</li> </ul>

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number      Publication Date

0 01/05/2024  
1 01/19/2024

BRAZ0003-007 07/01/2023

	Rates	Fringes
BRICKLAYER.....	\$ 32.74	9.52

ZONE PAY:

(Radius miles from the intersection of Central Ave. and Washington St., Phoenix, AZ)

- Zone A: 0-60 miles- Base Rate
- Zone B: 61-75 miles- Base Rate plus \$2.00 per hour
- Zone C: 75-100 miles- Base Rate plus \$3.00 per hour
- Zone D: 101-200 miles- Base Rate plus \$3.50 per hour
- Zone E: Over 200 miles- Base Rate plus \$6.50 per hour

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ELEC0518-002 01/01/2018

	Rates	Fringes
ELECTRICIAN.....	\$ 17.50	7.57

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ENGI0428-005 06/01/2022

	Rates	Fringes
POWER EQUIPMENT OPERATOR (Grader/Blade).....	\$ 34.49	12.57

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\* IRON0075-008 10/01/2023

	Rates	Fringes
IRONWORKER, STRUCTURAL.....	\$ 32.00	18.91

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PLAS0394-006 07/01/2019

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 25.08	8.57

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\* SUAZ2011-005 07/28/2011

	Rates	Fringes
CARPENTER, Excludes Drywall Hanging.....	\$ 18.16	0.00
FORM WORKER.....	\$ 14.37 **	0.00
HVAC MECHANIC (Installation of HVAC Duct).....	\$ 14.13 **	0.00
LABORER: Common or General.....	\$ 10.20 **	0.00
LABORER: Mason Tender - Brick...	\$ 12.77 **	0.00
LABORER: Mason Tender - Cement/Concrete/Stone.....	\$ 11.00 **	0.00

LABORER: Pipelayer.....	\$ 13.00 **	0.00
OPERATOR: Backhoe.....	\$ 18.29	0.00
OPERATOR: Excavator.....	\$ 24.67	0.00
OPERATOR: Forklift.....	\$ 16.00 **	0.00
OPERATOR: Loader (Front End)....	\$ 15.00 **	0.00
OPERATOR: Paver (Asphalt, Aggregate, and Concrete).....	\$ 20.75	0.00
OPERATOR: Roller.....	\$ 16.24 **	1.42
OPERATOR: Scraper.....	\$ 19.20	1.52
OPERATOR: Tractor.....	\$ 20.98	0.00
PAINTER: Brush, Roller and Spray.....	\$ 13.31 **	0.00
PLUMBER.....	\$ 20.14	4.08
ROOFER.....	\$ 13.67 **	0.00
TRUCK DRIVER: Dump Truck.....	\$ 17.02 **	0.00
TRUCK DRIVER: Water Truck.....	\$ 14.50 **	0.00

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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\*\* Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$17.20) or 13658 (\$12.90). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within

the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

#### Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

#### Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in

the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION"

"General Decision Number: AZ20240016 01/19/2024

Superseded General Decision Number: AZ20230016

State: Arizona

Construction Type: Heavy  
 HEAVY CONSTRUCTION, Includes Water and Sewer Lines and Heavy  
 Construction on Treatment Plant Sites

County: Coconino County in Arizona.

HEAVY CONSTRUCTION PROJECTS (DOES NOT INCLUDE DAM CONSTRUCTION)

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	<ul style="list-style-type: none"> <li>. Executive Order 14026 generally applies to the contract.</li> <li>. The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024.</li> </ul>
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	<ul style="list-style-type: none"> <li>. Executive Order 13658 generally applies to the contract.</li> <li>. The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.</li> </ul>

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number      Publication Date

0 01/05/2024  
1 01/19/2024

ELEC0640-006 01/01/2023

	Rates	Fringes
ELECTRICIAN.....	\$ 33.10	13.58

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ENGI0428-006 06/01/2023

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1.....	\$ 31.69	13.52
Group 2.....	\$ 34.96	13.52
Group 3.....	\$ 36.04	13.52
Group 4.....	\$ 37.07	13.52

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Small Self-Propelled Compactor (with blade), Roller Operator, Front End Loader (3 cy & less), Bobcat/Skidsteer/Skid Loader, Oiler

GROUP 2: Backhoe (less than 1 cyl), Self-Propelled Compactor (with blade), Bulldozer, Grader/Blade (rough), Front End Loader 3cy- less than 6 cu yd), Scraper

GROUP 3: Backhoe (up to 10 cu yd), Excavator/Trackhoe, Grader/Blade (finish), Front End Loader (6 cy-10cy)

GROUP 4: Backhoe (10 cu yd and over),Front End Loader (10 cy and over)

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\* IRON0075-009 10/01/2023

	Rates	Fringes
IRONWORKER, STRUCTURAL.....	\$ 32.00	18.91

Zone 1: 0 to 50 miles from City Hall in Phoenix or Tucson  
Zone 2: 050 to 100 miles - Add \$4.00  
Zone 3: 100 to 150 miles - Add \$5.00  
Zone 4: 150 miles & over - Add \$6.50

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LAB01184-007 06/01/2023

	Rates	Fringes
LABORER (Common or General).....	\$ 24.18	7.59

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PAIN0086-002 04/01/2017

	Rates	Fringes
PAINTER (Brush Only).....	\$ 19.58	6.40

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TEAM0104-002 07/01/2023

	Rates	Fringes
TRUCK DRIVER		

Group 2.....	\$ 26.00	1.60+a
Group 3.....	\$ 26.48	1.60+a
Group 4.....	\$ 27.73	1.60+a
Group 5.....	\$ 26.85	1.60+a
Group 6.....	\$ 28.52	1.60+a
A. Health & Welfare \$1,261.06 per month.		

FOOTNOTE:

a. Health & Welfare \$1261.06 per month.

TRUCK DRIVER CLASSIFICATIONS:

GROUP 2: 2 or 3 axle Dump , Water Truck under 2500 gal.

GROUP 3: 4 axle Dump, Water Truck Drive- (2500 gal but less than 4000 gal)

GROUP 4: 5 axle Dump, Water Truck 4000 gal and over

GROUP 5: 6-axle Dump

GROUP 6: 7-axle Dump, 8-axle Dump

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 \* SUAZ2012-005 05/17/2012

	Rates	Fringes
CARPENTER (Form Work Only).....	\$ 20.58	2.83
CARPENTER, Excludes Form Work....	\$ 21.86	5.37
CEMENT MASON/CONCRETE FINISHER...	\$ 18.71	2.12
IRONWORKER, REINFORCING.....	\$ 20.66	13.59
LABORER: Asphalt Raker/Shoveler/Spreader.....	\$ 15.69 **	4.42
LABORER: Concrete Saw (Hand Held/Walk Behind).....	\$ 17.00 **	4.55
LABORER: Grade Checker.....	\$ 18.14	4.55
LABORER: Irrigation.....	\$ 12.50 **	0.00
LABORER: Mason Tender - Cement/Concrete.....	\$ 14.59 **	4.20
LABORER: Pipelayer.....	\$ 14.92 **	3.46
LABORER: Power Tool Operator....	\$ 16.55 **	4.20
OPERATOR: Crane.....	\$ 20.76	4.42
OPERATOR: Drill.....	\$ 23.99	7.60
OPERATOR: Forklift.....	\$ 19.86	4.75
OPERATOR: Mechanic.....	\$ 20.92	5.15
OPERATOR: Paver (Asphalt, Aggregate, and Concrete).....	\$ 17.07 **	3.20
OPERATOR: Screed.....	\$ 16.82 **	2.52
OPERATOR: Tractor.....	\$ 24.43	7.70
OPERATOR: Trencher.....	\$ 18.28	4.26

OPERATOR: Broom/Sweeper.....\$ 15.40 **	2.45
PAINTER: Pavement Marking/Parking Lot Striping.....\$ 19.94	4.10
PAINTER: Roller and Spray.....\$ 20.19	4.45
TRUCK DRIVER: Flatbed Truck.....\$ 14.15 **	1.48

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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\*\* Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$17.20) or 13658 (\$12.90). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed

in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

#### Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination

- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
 Wage and Hour Division  
 U.S. Department of Labor  
 200 Constitution Avenue, N.W.  
 Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
 U.S. Department of Labor  
 200 Constitution Avenue, N.W.  
 Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
 U.S. Department of Labor  
 200 Constitution Avenue, N.W.  
 Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION"

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Mark Wilson, Deputy Fire Chief  
**Co-Submitter:** Emily Markel  
**Co-Submitter:** Emily Markel  
**Date:** 06/24/2024  
**Meeting Date:** 07/02/2024



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**TITLE:**

**Consideration and Approval of Contract:** Cooperative Purchase Contract with Hughes Fire Equipment, Inc. in the amount of \$1,064,108,07, plus fees and costs, for the purchase of two Fire Department Water Tenders with Bond funding.

**STAFF RECOMMENDED ACTION:**

1. Approve the Cooperative Purchase Contract with Hughes Fire Equipment, Inc. in the amount of \$1,064,108,07, plus fees and costs, for the purchase of two Fire Department Water Tenders with Bond funding; and
2. Authorize the City Manager to execute the necessary documents.

**Executive Summary:**

A water tender is a specialized vehicle that brings large amounts of water to a fire incident. The proposed Flagstaff Fire Department tenders are equipped with 2000-gallon tanks to help support smaller engines with additional water already operating on the fire. The use is typically for wildfires, but can also be used for interstate fires or structure fires in areas with limited water supply. Wildfires continue to increase in size, intensity, and cost in and around our community. Maintaining a quick, effective, and safe response by the Flagstaff Fire Department is critical to protecting our community and surrounding public forests. In response to increased wildfire threats in our area, FFD is recommending that the City Council approve a Cooperative Purchase Contract replacing two 20+-year-old fire Water Tenders with new units and funded through voter-approved Prop 441 funding. This purchase helps increase dependability by replacing older aged-out units and provides up-to-date safety equipment for our membership. FFD has chosen to work with Hughes Fire Equipment, Inc. through a vetted cooperative agreement. This company has also proven a high quality of work, and history with excellent warranty support.

**Financial Impact:**

**Project Name:** Prop 441 Bond Funding for replacement of two Fire Department Water Tenders  
**Cost:** \$1,064,108.07  
**Account Number Budgeted:** Bond Account - 410-03-051-0205-2-4401  
**FY2024-25 Budgeted Amount:** \$2,295,000  
**Grant Funded:** No  
**Funding Source:** Bond Funding plus money from General Fund to cover the gap approved by the City Budget Team in March of 2024.

**Policy Impact:**

None.

**Previous Council Decision or Community Discussion:**

The City Council, along with a Citizens Committee was informed and approved the voter 441 bond funding initiative to purchase two new Water Tenders for the Fire Department. We also held multiple public meetings to discuss the project and the purchasing of these units before the bond went to vote.

**Options and Alternatives to Recommended Action:**

1. Approve the Cooperative Purchase Contract with Hughes Fire Equipment, Inc. for the two new Water Tenders with Bond funding; or
2. Not purchase the units and maintain the use of the current 20+ year old units.

**Background and History:**

In 2021 a capital deficit was identified in the Fire Department that could not be covered by normal general funds. A bond committee was established to identify various unfunded capital projects in the city. The Fire Department was approved to place four (4) 20+ -year-old aged-out units that were not part of the current FLEET replacement plan. Two of those units have been purchased and the two Water Tenders are the two remaining to complete the voter-approved Fire Department initiative. These units will keep the Fire Department with dependable, safe, and efficient equipment for the various uses in which they serve.

City of Flagstaff Procurement department completed a review of an agency contract through the Houston-Galveston-Area-Council Cooperative Purchasing Program (HGAC). HGAC conducted a competitive open procurement through Request For Proposals ID:FS12-23 that resulted in contract FS12-23 with the Contractor.

**Connection to PBB Priorities and Objectives:**

Performance-Based Budget Priorities:

Safe & Healthy Community - Provide public safety with the resources, staff, and training to respond to community needs.

High Performing Governance - Serve the public by providing high-quality internal and external service.

**Connection to Regional Plan:**

Goal PF.3. Provide high-quality emergency response and public safety services including law enforcement, fire, medical, and ambulance transport service.

Policy PF.3.1. Maintain high-quality effectiveness and efficiency in law enforcement, fire, and emergency services to the extent that is consistent with governmental operations, plans, public policies, population served, and monies available.

**Connection to Carbon Neutrality Plan:**

Reduces carbon emission through wildfire mitigation.

**Connection to 10-Year Housing Plan:**

N/A

**Connection to Division Specific Plan:**

Part of the 8-year Apparatus capital replacement plan.

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**Attachments:**    2024-201 Hughes Fire Freightliner Tenders  
                          Exhibit A - Quote & Specs  
                          Exhibit B - Agency Contract  
                          Exhibit C - Photograph of Water Tender

## COOPERATIVE PURCHASE CONTRACT

Contract No. 2024-201

This Cooperative Purchase Contract is made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ by and between the City of Flagstaff, Arizona, a political subdivision of the State of Arizona ("City") and Hughes Fire Equipment, Inc., an Oregon "S" Corporation ("Contractor").

### RECITALS:

- A. Contractor is a fully authorized vendor of **Fire Apparatus and Related Vehicles**;
- B. The **Houston-Galveston-Area-Council Cooperative Purchasing Program (HGAC)** conducted a competitive and open procurement process through Request for Proposal **Project ID: FS12-23** that resulted in Contract No. **FS12-23** with Contractor ("Agency Contract"); and
- C. The City has authority to enter into a cooperative purchase contract with Contractor utilizing the Agency Contract.

### AGREEMENT:

NOW THEREFORE, in consideration for the mutual promises herein, the Parties agree as follows:

1. Materials and or Services Purchased: Contractor shall provide to the City the materials and/or services, as specified in the Scope of Work attached as Exhibit A, and in accordance with the Agency Contract. A general description of materials and/or services being purchased is:

#### **TWO (2) FREIGHTLINER 114SD BME CASCADE TENDERS**

2. Specific Requirements of City: Contractor shall comply with all specific purchase and delivery requirements and/or options of City, as specified in the Scope of Work attached as Exhibit A and incorporated by reference.
3. Payment: Payment to Contractor for the materials and/or services not to exceed **ONE MILLION SIXTY-FOUR THOUSAND ONE HUNDRED EIGHT DOLLARS AND SEVEN CENTS (\$1,064,108.07)**, in addition to other fees and costs; made in accordance with the price list and terms set forth in the Agency Contract. Any price adjustment must be approved by mutual written consent of the parties through a formal amendment. The City Manager or his/her designee (the Purchasing Director) may approve an amendment if the amendment price increase is less than \$100,000; otherwise, City Council approval is required.
4. Certificates of Insurance: All insurance provisions of the Agency Contract shall apply, including any requirement to name the City as an additional insured. Prior to commencing performance under this Contract, Contractor shall furnish City with a copy of the current Certificate of Insurance required by the Agency Contract.
5. Term: This Cooperative Purchase Contract shall commence upon execution by the Parties and shall continue until expiration or termination of the underlying Agency Contract, unless sooner terminated by City in writing.

6. Renewal: This Cooperative Purchase Contract shall be automatically renewed if the underlying Agency Contract is renewed, for the same renewal period, unless City provides advance written notice to Contractor of its intention to non-renew.
7. Notice: Any formal notice required under the Contract shall be in writing and sent by certified mail and email as follows:

To the City:  
 Mark Wilson  
 Deputy Chief  
 City of Flagstaff  
 211 W. Aspen Ave.  
 Flagstaff, AZ 86001  
[mwilson@flagstaffaz.gov](mailto:mwilson@flagstaffaz.gov)  
 928-213-2506

To Contractor:  
 Ed McDonald  
 Hughes Fire Equipment, Inc.  
 5159 W. Roosevelt Street  
 Phoenix, AZ 85043  
[emcdonald@hughesfire.com](mailto:emcdonald@hughesfire.com)  
 623-910-4415

With a copy to:  
 Emily Markel  
 Purchasing Manager  
 City of Flagstaff  
 211 W. Aspen Ave.  
 Flagstaff, AZ 86001  
[emarkel@flagstaffaz.gov](mailto:emarkel@flagstaffaz.gov)

9. Authority: Each Party warrants that it has authority to enter into the Contract and perform its obligations hereunder, and that it has taken all actions necessary to enter into the Contract.

HUGHES FIRE EQUIPMENT, INC.:

By: \_\_\_\_\_

Title: \_\_\_\_\_

CITY OF FLAGSTAFF

By: \_\_\_\_\_

Title: \_\_\_\_\_

ATTEST:

\_\_\_\_\_  
 City Clerk

APPROVED AS TO FORM:

\_\_\_\_\_  
 City Attorney's Office

Notice to Proceed issued: \_\_\_\_\_, 20\_\_

**EXHIBIT A**  
**SCOPE OF WORK**  
(attached)

- 1. Two (2) Freightliner 114SD BME Cascade Tenders EM10673-0003 QUOTE (64 Pages)**

**EXHIBIT B**  
**AGENCY CONTRACT**  
(attached)

1. **FS12-23\_Contract\_-\_Hughes\_Fire\_Equipment (31 pages)**



6/11/2024

Flagstaff Fire Department, AZ  
Two (2) Freightliner 114SD BME Cascade Tenders EM10673-0003  
Build Location: Boise, Idaho

Proposal Price	\$993,776.00	
Arizona State Sales Tax @ 5.60%		55,651.46
Phoenix Sales Tax @ 2.70%		26,831.95
PHX Transportation Plan Tax @ 0.3% of \$13,886.00		83.32
<b>Total Bid Price Including Sales Tax</b>		<b>\$1,076,342.73</b>
Less payment upon completion @ factory discount	(11,297.00)	
<b>Subtotal including all pre-pay discounts</b>	<b>\$982,479.00</b>	
Arizona State Sales Tax @ 5.60%		55,018.82
Phoenix Sales Tax @ 2.70%		26,526.93
PHX Transportation Plan Tax @ 0.3% of \$13,886.00		83.32
<b>Total Bid Price Including Sales Tax</b>		<b>\$1,064,108.07</b>

**Terms:**

**Price Expiration:** The above pricing is valid until July 30, 2024.

**Delivery:** Based on BME's current delivery schedule the apparatus would be ready for delivery within **18 to 20** months from receipt of chassis at the manufacturing facility. Delivery is subject to change pending BME's delivery schedule at time of order. This time does not include any possible delays that may be caused by national disasters or pandemic.

**Payment Terms:**

- a. If pre-payment discount options are elected, the following terms will apply:
  - i. **Payment Upon Completion at Factory Discount:** If elected, final payment is due prior to apparatus leaving the factory for delivery. If payment is not processed upon receipt of invoice the discount total will be required in addition to the invoice amount.
  - b. If pre-payment discount options are not elected standard payment terms will apply: Final payment will be due 10 days after the apparatus leaves the factory for delivery. If payment is not made at that time a late fee will be applicable.
  - c. If Customer elects to purchase the proposed apparatus using a credit card a convenience fee will be applicable.

**Change Orders:** Changes processed after order placement will be processed per the following structure; deductions will be based on the option price at time of order placement, additions will be based on current pricing levels at time of change request.

**Consortium Purchase:** The proposal is based on the unit being purchased through H-GACBuy (Houston-Galveston-Area-Council Cooperative Purchasing Program) utilizing contract FS12-23 valid until 11/30/2027, with a registered End User member Interlocal Contract "ILC." It is the purchaser's responsibility to determine if the use of consortiums meets their purchasing requirements. More information can be found at hgacbuy.org.

**Component/Chassis Price Volatility:** BME and the dealer have absolutely no control over chassis pricing and/or delivery. BME will issue a quote to the dealer for the chassis price, but pricing can/will be subject to any increases or surcharges issued by the manufacturer. Significant components, i.e., tanks, pumps, lighting, and or controls, could be subject to an increase if it is over 3%. Any price increase for components/chassis of Product will be passed through to the Customer and will be documented on a Change Order.

**Performance Bond:** A performance bond is not included in the above price.

**Transportation:** Transportation of the apparatus to be driven from the factory to the customer's location is included in the above pricing. If customer elects to drive the apparatus from the factory, **\$6,000.00 (or \$3,000.00 per unit)** may be deducted from the purchase price. If this option is elected payment in full and proof of insurance must be provided prior to leaving the factory and the customer is responsible for compliance with all state, local and federal DOT requirements.

**Inspection Trips:** Two (2) factory inspection trips for four (4) customer representatives is included in the above pricing. The inspection trips will be scheduled at times mutually agreed upon between the manufacture's representative and the customer, during the window provided by the manufacturer. Airfare, lodging and meals while at the factory are included. In the event the customer is unable to travel to the factory or the factory is unable to accept customers due to the restrictions caused by a national disaster or pandemic then the Dealership reserves the right to use forms of electronic media to accomplish the intention of the inspection trips. Every effort will be made to make the digital media as thorough as possible to satisfy the expectations of the of the customer. If the customer elects to forgo an inspection trip **\$2,000.00** per traveler (per trip) will be deducted from the final invoice.

**Acceptance of Proposal:** If the customer wishes to purchase the proposed apparatus Hughes Fire Equipment will provide the Customer its form of Purchase Agreement for the Customer's review and signature. If the Customer desires to use its standard form of purchase order as the Purchase Agreement, the purchase order is subject to review for any required revisions prior to acceptance. **All purchase orders shall be made out to Hughes Fire Equipment.**

BME Fire Trucks, LLC



**FIRE TRUCKS**

FOR  
**FLAGSTAFF FIRE DEPARTMENT**

**3,000 GALLON TENDER  
"CASCADE"**

**DETERMINATION OF APPARATUS WEIGHT**

# BME Fire Trucks, LLC

BME Fire Trucks, LLC. shall submit estimated "in-service" weight analysis required by applicable NFPA standards. This Excel computer weight analysis shall break down all major components of the apparatus and shall show the impact on percentage-of-load on the front and rear axles, total weight, and weight on each tire set.

The analysis shall evenly distribute the NFPA required minimum payload allowance or estimated equipment payload as provided by the purchaser into the specified compartments. The allowance for personnel, hose loads, water and foam fluids, and required NFPA equipment shall be outlined individually in the analysis and placed on the apparatus in its specific intended position.

## **CENTER-OF-GRAVITY ANALYSIS**

BME Fire Trucks, LLC. shall perform an estimated center of gravity calculation as required by the applicable section of NFPA standards. This calculation shall include tilt angles, the estimated right to left load distribution, and load on each axle, including all specified major components.

## **LOW VOLTAGE TEST REQUIRMENTS**

The fire apparatus low voltage electrical system shall be tested as required by this section and the test results shall be certified by the apparatus manufacturer. The certification shall be delivered to the purchaser with the documentation for the completed apparatus. The tests shall be performed when the air temperature is between 0 degrees Fahrenheit and 110 degrees Fahrenheit.

## **TEST SEQUENCE**

The three tests defined below shall be performed in the order in which they appear. Before each test, the chassis batteries shall be fully charged until the voltage stabilizes at the voltage regulator set point and the lowest charge current is maintained for 10 minutes. The failure of any of these tests shall require a repeat of the test sequence.

## **RESERVE CAPACITY TEST**

The chassis engine shall be started and kept running until the chassis engine and engine compartment temperatures are stabilized at normal operating temperatures and the chassis battery system is fully charged. The chassis engine shall be shut off and the minimum continuous electrical load shall be applied for 10 minutes. All electrical loads shall be turned off prior to attempting to restart the chassis engine. The chassis battery system shall then be capable of restarting the chassis engine. The failure to restart the chassis engine shall be considered a failure of this test.

## **ALTERNATOR PERFORMANCE TEST AT IDLE**

# BME Fire Trucks, LLC

The minimum continuous electrical load shall be applied with the chassis engine running at idle speed. The chassis engine temperature shall be stabilized at normal operating temperature. The chassis battery system shall be tested to detect the presence of a chassis battery current discharge. The detection of chassis battery current discharge shall be considered a failure of this test.

## **ALTERNATOR PERFORMANCE TEST AT FULL LOAD**

The total continuous electrical load shall be applied with the chassis engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of two hours. The activation of the electrical system load management system shall be permitted during this test. The activation of an alarm due to excessive chassis battery discharge, as detected by the system required by NFPA (current edition), or an electrical system voltage of less than 11.8 volts direct current for a 12 volt direct current nominal system, for more than 120 seconds, shall be considered a failure of this test.

## **LOW VOLTAGE ALARM TEST**

Following the completion of the tests described above, the chassis engine shall be turned off. With the chassis engine turned off, the total continuous electrical load shall be applied and shall continue to be applied until the excessive battery discharge alarm activates. The chassis battery voltage shall be measured at the battery terminals.

The test shall be considered to be a failure if the low voltage alarm has not yet sounded 140 seconds after the voltage drops to 11.70 volts direct current for a 12 volt direct current nominal system. The chassis battery system shall then be able to restart the chassis engine. The failure of the chassis battery system to restart the chassis engine shall be considered a failure of this test.

The completed fire apparatus shall undergo a complete 12 volt electrical load and performance testing per applicable sections of NFPA standards with inspection and test sheets included in delivery documentation.

## **DOCUMENTATION**

The apparatus manufacturer shall provide the results of the low-voltage electrical system performance test, certified in writing, with the documentation provided to the purchaser at the time of delivery of the completed apparatus.

The test results shall consist of the following documents:

- (1) Documentation of the electrical system performance tests.
- (2) A written electrical load analysis, including the following:
  - (a) The nameplate rating of the alternator.
  - (b) The alternator rating under the conditions specified in NFPA 1906 (current edition).
  - (c) Each of the component loads specified that make up the minimum continuous electrical load.

# BME Fire Trucks, LLC

- (d) Additional electrical loads that, when added to the minimum continuous electrical load, determine the total continuous electrical load.
- (e) Each individual intermittent electrical load.

## **TEST RESULTS**

BME Fire Trucks LLC. shall provide results of the apparatus testing and shall certify the following:

The weight of the completed apparatus, when loaded to its estimated in service weight, does not exceed the GVWR and GAWR of the chassis.

The complete unit, when loaded to its estimated in service weight, meets the weight distribution and vehicle stability requirements, as defined in the current NFPA guidelines.

The unit meets all required federal standards pertaining to the manufacturer and completion of the apparatus and a label tag has been affixed to the apparatus by the manufacturer stating same.

BME Fire Trucks LLC. shall provide all testing results, including engine, speed, acceleration, road ability, braking, and auxiliary braking to the Purchaser at the time of delivery.

## **DELIVERY REQUIREMENTS**

The bidder shall not be responsible for delays in delivery due to strikes, acts of God, failure of suppliers to deliver, chassis shortage and other reasons beyond the reasonable control of the builder. Should BME Fire Trucks, LLC. be unable to comply with the proposed delivery date, we shall immediately contact the purchaser regarding delay information and actions to be taken by the company.

This vehicle shall be F.O.B. the BME Fire Trucks facility in Boise Idaho. Dealer shall be responsible for arrangement of delivery from factory.

## **GENERAL WARRANTY PROVISIONS**

All materials and workmanship herein specified, including all equipment furnished, shall be guaranteed for a period of one (1) year after the acceptance date of the apparatus, unless otherwise noted, with the exception of any normal maintenance services or adjustments which shall be required. Under this warranty, BME Fire Trucks, LLC. shall be responsible for the costs of repairs to the apparatus that have been caused by defective workmanship or materials during this period.

This warranty shall not apply to the following:

- Any component parts or trade accessories such as chassis, engines, tires, pumps, valves, signaling devices, batteries, electric lights, bulbs, alternators, and all other installed equipment and accessories, in as much as they are usually warranted separately by their respective manufacturers, or are subject to normal wear and tear.

# BME Fire Trucks, LLC

- Failures resulting from the apparatus being operated in a manner or for a purpose not recommended by the apparatus manufacturer.
- Loss of time or use of the apparatus, inconvenience or other incidental expenses.
- Any apparatus which has been repaired or altered without written consent or outside of the apparatus manufacturer's factory and or authorized service center in any way that affects its stability, or which has been subject to misuse, negligence, or accident.
- Delivery of the apparatus to repair site.

## **DISCLAIMER**

NO WARRANTIES ARE GIVEN BEYOND THOSE DESCRIBED HEREIN. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. THE COMPANY SPECIFICALLY DISCLAIMS WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ALL OTHER REPRESENTATIONS TO THE USER/PURCHASER AND ALL OTHER OBLIGATIONS OR LIABILITIES. FURTHER, THE COMPANY EXCLUDES LIABILITY FOR CONSEQUENTIAL AND INCIDENTAL DAMAGES, ON THE PART OF THE COMPANY OR SELLER. No person is authorized to give any other warranties or to assume any liabilities on the Company's behalf unless made or assumed in writing by the seller; and no other person is authorized to give any warranties or to assume any liabilities on the seller's behalf unless made or assumed in writing by the seller.

## **OBTAINING SERVICE**

Return the vehicle to any BME Fire Trucks, LLC. dealer/authorized service center; Return the vehicle to BME Fire Trucks, LLC. or contact BME Fire Trucks, LLC.. BME Fire Trucks, LLC. shall be solely responsible for determining the extent of repair under the terms of the warranty. Transportation costs shall be the responsibility of the purchaser.

## **MATERIAL AND WORKMANSHIP**

All equipment provided shall be guaranteed to be new and of current manufacture, and unless specified otherwise, shall meet all requirements of these specifications and prevailing NFPA documents and be in condition at time of delivery for use as specified for this type of apparatus.

All workmanship shall be of the highest quality and accomplished in a professional manner so as to insure a functional apparatus with a high quality aesthetic appearance.

# BME Fire Trucks, LLC

The construction shall be rugged and ample safety factors shall be provided to carry the loads specified to meet both on and off road requirements.

The apparatus shall be designed and the equipment mounted with due consideration to the distribution of load between the front and rear axles, so all specified equipment, with a full complement of personnel, can be carried without damage to the apparatus.

## **BODY AND STRUCTURAL WARRANTY**

BME Fire Trucks, LLC. shall warrant each new apparatus body, if used in a normal and reasonable manner, against structural defects caused by defects in material, design or workmanship for a period of ten (10) years, covering parts & labor to the original purchaser which shall start on day of acceptance.

This warranty shall not apply to:

- Normal maintenance services or adjustments
- To any vehicle which will have been repaired or altered outside of our factory in any way so as, in the judgment of BME Fire Trucks, LLC., to affect it's stability, nor which has been subject to misuse, negligence, or accident, nor to any vehicle made by us which will have been operated to a speed exceeding the factory rated speed, or loaded beyond the factory rated load capacity.
- Commercial chassis and associated equipment furnished with chassis, signaling devices, generators, batteries, or other trade accessories as they are usually warranted separately by their respective manufacturers.
- Shipping costs of parts or apparatus for purposes of repair or replacement of parts. This warranty is in lieu of all other warranties, expressed or implied. All other representations as to the original purchaser and all other obligations or liabilities, including for incidental or consequential damage on the company's behalf unless made in writing by the company.

## **PLUMBING WARRANTY**

The stainless steel fire pump plumbing shall carry a ten (10) year parts and labor warranty against defects in workmanship and perforation corrosion.

## **AKRON VALVE WARRANTY**

The Akron valves shall carry a ten (10) year parts and labor manufacturer's warranty. Provisions of this warranty shall be provided with the completed apparatus documentation.

## **PAINT WARRANTY**

# BME Fire Trucks, LLC

BME Fire Trucks, LLC. shall provide a seven (7) year paint warranty which shall cover peeling and/or de-lamination of the top coat and other layers of paint, cracking or checking, loss of gloss caused by cracking, checking or chalking, and any paint failure caused by defective paint materials covered by the paint manufacturer's material warranty.

## **CHASSIS WARRANTY**

The specified chassis shall be provided with the chassis manufacturer's warranty. The exact provisions of this warranty shall be supplied with the completed apparatus documentation.

## **APPARATUS OPERATION MANUAL(S)**

BME Fire Trucks, LLC. shall provide (2) electronic apparatus operational manual(s) on a USB thumb drive.

## **CHASSIS SPECIFICATIONS**

FREIGHTLINER 114SD PLUS CONVETIONAL CHASSIS

2025 MODEL YEAR SPECIFIED

SET BACK AXLE – TRUCK

STRAIGHT TRUCK PROVISION, NON-TOWING

LH PRIMARY STEERING LOCATION

DOMICILED, USA 50 STATES (INCLUDING CALIFORNIA AND CARB OPT-IN STATES)

EPA EMISSIONS CERTIFICATION FOR 50 STATE REGISTRATION – CARB EXEMPT, FIRE AND EMERGENCY VEHICLES ONLY (INCLUDES 6X4 INCH LABEL SHIPPED LOOSE

EXPECTED FRONT AXLE(S) LOAD: 20,000 lbs

EXPECTED REAR DRIVE AXLE(S) LOAD: 46,000 lbs

EXPECTED GROSS VEHICLE WEIGHT CAPACITY: 66,000 lbs

FIRE TANK – NO MAIN DRIVELINE DRIVEN SPLIT-SHAFT PTO/PUMP

CUM X12 500EV HP @ 1900 RPM, 1700 LB-FT @ 1000 RPM, 2000 GOV RPM, R/F/E

68 MPH ROAD SPEED LIMIT

Mark Wilson

# BME Fire Trucks, LLC

CRUISE CONTROL SPEED LIMIT SAME AS ROAD SPEED LIMIT

PTO MODE ENGINE RPM LIMIT – 1350 RPM

PTO RPM WITH CRUISE SET SWITCH – 1100 RPM

PTO RPM WITH CRUISE RESUME SWITCH – 1100 RPM

PTO GOVERNOR RAMP RATE – 100 RPM PER SECOND

CRUISE CONTROL BUTTON PTO CONTROL

PTO SPEED 1 SETTING – 900 RPM

PTO SPEED 2 SETTING – 1100 RPM

PTO SPEED 3 SETTING – 1300 RPM

ENGINE FAN ENABLED WITH RETARDER

PTO MINIMUM RPM – 900

REGEN INHIBIT SPEED THRESHOLD – 5 MPH

PTO 1, DASH SWITCH, ENGAGE WHILE DRIVING

PTO 2, DASH SWITCH, STATIONARY OPERATION

EPA 2010/GHG 2024 CONFIGURATION

STANDARD OIL PAN

OIL FILL AND DIPSTICK LOCATED FOR ENHANCED SERVICEABILITY

SIDE OF HOOD AIR INTAKE WITH NFPA COMPLIANT EMBER SCREEN AND FIRE RETARDANT  
DONALDSON AIR CLEANER

DR 12V 300 AMP 40-SI BRUSHLESS PAD MOUNT ALTERNATOR WITH REMOTE BATTERY VOLTAGE  
SENSE

(3) DTNA GENUINE, FLOODED STARTING, MIN 2850CCA, 525RC, THREADED STUD BATTERIES

BATTERY BOX FRAME MOUNTED

STANDARD BATTERY JUMPERS

10673-0003

# BME Fire Trucks, LLC

BATTERY BOX FRAME MOUNTED LH SIDE 60 INCHES AFT OF CAB

WIRE GROUND RETURN FOR BATTERY CABLES WITH ADDITIONAL FRAME GROUND RETURN

NON-POLISHED BATTERY BOX COVER

POSITIVE LOAD DISCONNECT WITH CAB MOUNTED CONTROL SWITCH WITH LOCKING PROVISION MOUNTED OUTBOARD DRIVER SEAT

POSITIVE AND NEGATIVE POSTS FOR JUMPSTART LOCATED ON FRAME NEXT TO STARTER

CUMMINS NATURALLY ASPIRATED 25.9 CFM AIR COMPRESSOR WITH INTERNAL SAFETY VALVE

GVG, FIRE AND EMERGENCY SERVICE VEHICLES ENGINE WARNING

CUMMINS INTEBRAKE WITH HIGH MED LOW BRAKE WITH BRAKE LAMPS

RH OUTBOARD UNDER STEP MOUNTED HORIZONTAL AFTERTREATMENT SYSTEM ASSEMBLY WITH RH HORIZONTAL TAILPIPE

ENGINE AFTERTREATMENT DEVICE, AUTOMATIC OVER THE ROAD ACTIVE REGENERATION AND VIRTUAL REGENERATION REQUEST SWITCH IN CLUSTER AND DASH MOUNTED INHIBIT SWITCH

STANDARD EXHAUST SYSTEM LENGTH

RH STANDARD HORIZONTAL TAILPIPE

13 GALLON DIESEL EXHAUST FLUID TANK

100 PERCENT DIESEL EXHAUST FLUID FILL

STANDARD DIESEL EXHAUST FLUID PUMP MOUNTING

POLISHED ALUMINUM DIAMOND PLATE DIESEL EXHAUST FLUID TANK COVER

LH MEDIUM DUTY STANDARD DIESEL EXHAUST FLUID TANK LOCATION

STANDARD DIESEL EXHAUST FLUID TANK CAP

HORTON 2-SPEED DRIVEMASTER ADVANTAGE POLAREXTREME FAN DRIVE

AUTOMATIC FAN CONTROL WITH DASH SWITCH AND INDICATOR LIGHT, NON ENGINE MOUNTED

CUMMINS SPIN ON FUEL FILTER

# BME Fire Trucks, LLC

COMBINATION FULL FLOW/BYPASS OIL FILTER

1500 SQUARE INCH ALUMINUM RADIATOR

ANTIFREEZE TO -60F, ETHYLENE GLYCOL PRECHARGED SCA HEAVY DUTY COOLANT

GATES BLUE STRIPE COOLANT HOSES OR EQUIVALENT

CONSTANT TENSION HOSE CLAMPS FOR COOLANT HOSES

RADIATOR DRAIN VALVE

PHILLIPS-TEMRO 1500 WATT/115 VOLT BLOCK HEATER

CHROME ENGINE HEATER RECEPTACLE MOUNTED UNDER LH DOOR

DELCO 12V 39MT HD/OCP STARTER WITH THERMAL PROTECTION AND INTEGRATED MAGNETIC SWITCH

ALLISON 4500 EVS AUTOMATIC TRANSMISSION WITH PTO PROVISION

ALLISON VOCATIONAL PACKAGE 265-AVAILABLE ON 3000/4000 PRODUCT FAMILIES WITH VOCATIONAL MODEL EVS

ALLISON VOCATIONAL RATING FOR FIRE TRUCK/EMERGENCY VEHICLE APPLICATIONS AVAILABLE WITH ALL PRODUCT FAMILIES

PRIMARY MODE GEARS, LOWEST GEAR 1, START GEAR 1, HIGHEST GEAR 6, AVAILABLE FOR 3000/4000 PRODUCT FAMILIES ONLY

SECONDARY MODE GEARS, LOWEST GEAR 1, START GEAR 1, HIGHEST GEAR 6, AVAILABLE FOR 3000/4000 PRODUCT FAMILIES ONLY

S5 PERFORMANCE LIMITING PRIMARY SHIFT SCHEDULE, AVAILABLE FOR 3000/4000 PRODUCT FAMILIES ONLY

FIXED SECONDARY SHIFT SCHEDULE, AVAILABLE FOR 3000/4000 PRODUCT FAMILIES ONLY

2000 RPM PRIMARY MODE SHIFT SPEED

2000 RPM SECONDARY MODE SHIFT SPEED

2ND GEAR ENGINE BRAKE ALTERNATE PRESELECT WITH MODERATE DOWNSHIFT STRATEGY

FUEL SENSE 2.0 DISABLED PERFORMANCE – TABLE BASED

# BME Fire Trucks, LLC

DRIVER SWITCH INPUT – DEFAULT – NO SWITCHES

DIRECTION CHANGE ENABLED WITH MULTIPLEXED SERVICE BRAKES – ALLISON 5TH GEN TRANSMISSION

QUICKFIT BODY LIGHTING CONNECTOR UNDER CAB, WITH BLUNTCUTS

ELECTRONIC TRANSMISSION WIRING TO CUSTOMER INTERFACE CONNECTOR

(2) CUSTOMER INSTALLED CHELSEA 280 SERIES PTO'S

PTO MOUNTING, LH SIDE AND TOP RH SIDE OF MAIN TRANSMISSION ALLISON

MAGNETIC PLUGS, ENGINE DRAIN, TRANSMISSION DRAIN, AXLE(S) FILL AND DRAIN

PUSH BUTTON ELECTRONIC SHIFT CONTROL, DASH MOUNTED

TRANSMISSION PROGNOSTICS – ENABLED 2013

WATER TO OIL TRANSMISSION COOLER, FRAME MOUNTED

TRANSMISSION OIL CHECK AND FILL WITH ELECTRONIC OIL LEVEL CHECK

SYNTHETIC TRANSMISSION FLUID (TES-295 COMPLIANT)

CUMMINS-MERITOR MFS-20-133A 20,000# FL1 71.0 INCH KPI/3.74 INCH DROP SINGLE FRONT AXLE

MERITOR 16.5X6 Q+ CAST SPIDER CAM FRONT BRAKES, DOUBLE ANCHOR, FABRICATED SHOES

FIRE AND EMERGENCY SEVERE SERVICE, NON-ASBESTOS FRONT LINING

CAST IRON OUTBOARD FRONT BRAKE DRUMS

FRONT OIL SEALS

VENTED FRONT HUB CAPS WITH WINDOW, CENTER AND SIDE PLUGS – OIL

STANDARD SPINDLE NUTS FOR ALL AXLES

MERITOR AUTOMATIC FRONT SLACK ADJUSTERS

STANDARD KING PIN BUSHINGS

TRW THP-60 POWER STEERING WITH RCH45 AUXILIARY GEAR

# BME Fire Trucks, LLC

POWER STEERING PUMP

4 QUART POWER STEERING RESERVOIR

OIL/AIR POWER STEERING COOLER

CURRENT AVAILABLE SYNTHETIC 75W-90 FRONT AXLE LUBE

20,000# TAPERLEAF FRONT SUSPENSION

MAINTENANCE FREE RUBBER BUSHINGS – FRONT SUSPENSION

FRONT SHOCK ABSORBERS

CUMMINS-MERITOR RT-46-160 46,000# R-SERIES TANDEM REAR AXLE

4.56 REAR AXLE RATIO

IRON REAR AXLE CARRIER WITH STANDARD AXLE HOUSING

MXL 18T MERITOR EXTENDED LUBE MAIN DRIVELINE WITH HALF ROUND YOKES

MXL 17T MERITOR EXTENDED LUBE INERAXLE DRIVELINE WITH HALF ROUND YOKES

DRIVER CONTROLLED TRACTION DIFFERENTIAL – BOTH TANDEM REAR AXLES

(1) INTERAXLE LOCK VALVE, (1) DRIVER CONTROLLED DIFFERENTIAL LOCK FORWARD-REAR AXLE VALVE AND (1) REAR-REAR AXLE VALVE

INDICATOR LIGHT FOR EACH INTERAXLE LOCKOUT SWITCH, DISENGAGE INTERAXLE LOCK WITH IGNITION OFF OR VEHICLE SPEED EXCEEDING 25MPH

INDICATOR LIGHT FOR EACH DIFFERENTIAL LOCKOUT SWITCH, ENGAGE AT SPEEDS 5 MPH OR LESS, DISENGAGE W/IGN OFF OR SPEEDS EXCEEDING 25 MPH

MERITOR 16.5X7 Q+ CAST SPIDER HEAVY DUTY CAM REAR BRAKES, DOUBLE ANCHOR, FABRICATED SHOES

FIRE AND EMERGENCY SEVERE SERVICE NON-ASBESTOS REAR BRAKE LINING

ASPHALT SPREADER CLEARANCE REAR BRAKE GEOMETRY

CAST IRON OUTBOARD REAR BRAKE DRUMS

REAR OIL SEALS

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# BME Fire Trucks, LLC

WABCO TRISTOP D LONGSTROKE 2-DRIVE AXLE SPRING PARKING CHAMBERS

HALDEX AUTOMATIC RAR SLACK ADJUSTERS

CURRENT AVAILABLE SYNTHETIC 75W-90 REAR AXLE LUBE

STANDARD REAR AXLE BREATHER(S)

HENDRICKSON HAULMAAX EX 46,000# REAR SUSPENSION

HENDRICKSON HAULMAAX/ULTIMAAX – 10.50” RIDE HEIGHT

54 INCH AXLE SPACING

HENDRICKSON HN, HAULMAAX AND ULTIMAAX SERIES STEEL BEAMS WITH BAR PIN

HEAVY DUTY FORE/AFT/TRANSVERSE CONTROL RODS

DOUBLE REBOUND STRAP – INBOARD AND OUTBOARD

REAR SHOCK ABSORBERS – TWO AXLES (TANDEM)

NO PUSHER/TAG BRAKE DUST SHIELDS

WABCO 4S/4M ABS WITH TRACTION CONTROL WITH ATC SHUT OFF SWITCH

REINFORCED NYLON, FABRIC BRAID AND WIRE BRAID CHASSIS AIR LINES

FIBER BRAID PARKING BRAKE HOSE

STANDARD BRAKE SYSTEM VALVES

STANDARD AIR SYSTEM PRESSURE PROTECTION AND 85 PSI PRESSURE PROTECTION FOR AIR HORN(S)

STD U.S. FRONT BRAKE VALVE

RELAY VALVE WITH 5-8 PSI CRACK PRESSURE, NO REAR PROPORTIONING VALVE

WABCO SYSTEM SAVER HP WITH INTEGRAL AIR GOVERNOR AND HEATER

AIR DRYER FRAME MOUNTED

STEEL AIR BRAKE RESERVOIRS MOUNTED INSIDE RAIL; CUSTOMER ACCEPTS TANKS MOUNTED IN REAR OVERHANG/REAR SUSPENSION

10673-0003

06/11/24

Mark Wilson

# BME Fire Trucks, LLC

PULL CABLE ON WET TANK, PETCOCK DRAIN VALVES ON ALL OTHER AIR TANKS

NO TRAILER AIR HOSE

NO AIR HOSE HANGER

NO TRAILER ELECTRICAL CABLE

5950MM (234 INCH) WHEELBASE

11/32X3-1/2X10-15/16 INCH STEEL FRAME (8.73MMX277.8MM/0.344X10.94 INCH) 120KSI

1/4 INCH (6.35MM) C-CHANNEL INNER FRAME REINFORCEMENT

2200MM (87 INCH) REAR FRAME OVERHANG

FRAME OVERHANG RANGE: 81 INCH TO 90 INCH

24 INCH INTEGRAL FRONT FRAME EXTENSION WITH 0.25 INCH INSERT

CALCULATED BACK OF CAB TO REAR SUSP C/L (CA): 168.7 in

CALCULATED EFFECTIVE BACK OF CAB TO REAR SUSPENSION C/L (CA): 165.7 in

CALCULATED FRAME LENGTH – OVERALL: 390.46 in

CALCULATED FRAME SPACE LH SIDE: 60.23 in

CALCULATED FRAME SPACE RH SIDE: 113.58 in

SQUARE END OF FRAME

FRONT CLOSING CROSSMEMBER

STANDARD WEIGHT ENGINE CROSSMEMBER

STANDARD MIDSHIP #1 CROSSMEMBER(S)

STANDARD REARMOST CROSSMEMBER

STANDARD SUSPENSION CROSSMEMBER

BETTS B-25 PAINTED MUDFLAPS BRACKETS

BLACK MUDFLAPS

10673-0003

# BME Fire Trucks, LLC

GRADE 8 THREADED HEX HEADED FRAME FASTENERS

EXTERIOR HARNESES WRAPPED IN ABRASION TAPE

D15-28195-000 CENTER PUNCH TO MARK CENTERLINE OF REAR SUSPENSION ON TOP FLANGE OF FRAME

TANK BODY 1501 TO 3000 GALLONS

80 GALLON/302 LITER RECTANGULAR ALUMINUM FUEL TANK – LH

RECTANGULAR FUEL TANK(S)

POLISHING OF FUEL/HYDRAULIC TANK(S) WITH PAINTED BANDS

FUEL TANK(S) FORWARD

POLISHED STEP FINISH

CHROME FUEL TANK CAP(S)

ALLIANCE FUEL FILTER/WATER SEPARATOR WITH HEATED BOWL AND INDICATOR LIGHT

EQUIFLO INBOARD FUEL SYSTEM

AUXILIARY FUEL SUPPLY AND RETURN PORTS LOCATED ON LH FUEL TANK

HIGH TEMPERATURE REINFORCED NYLON FUEL LINE

MICHELIN XZU-S2 315/80R22.5 20 PLY RADIAL FRONT TIRES

MICHELIN XDN2 12R22.5 16 PLY RADIAL REAR TIRES

CONMET PRESET PLUS PREMIUM IRON FRONT HUBS

CONMET PRESET PLUS PREMIUM IRON REAR HUBS

ALCOA ULTRA ONE 89U64X22.5X9.00 10-HUB PILOT 5.99 INSET ALUMINUM FRONT WHEELS

ALCOA ULTRA ONE 89U64X22.5X9.00 10-HUB PILOT 5.99 INSET ALUMINUM REAR WHEELS

POLISHED FRONT WHEELS; OUTSIDE ONLY

POLISHED REAR WHEELS; OUTSIDE OF OUTER WHEELS ONLY

# BME Fire Trucks, LLC

FRONT WHEEL MOUNTING NUTS

REAR WHEEL MOUNTING NUTS

114 INCH BBC FLAT ROOF ALUMINUM CONVENTIONAL CAB

AIR CAB MOUNTING

CAB ROOF REINFORCEMENTS FOR ROOF MOUNTED COMPONENTS

NONREMOVABLE BUGSCREEN MOUNTED BEHIND GRILLE

FRONT FENDERS SET-BACK AXLE

BOLT-ON MOLDED FLEXIBLE FENDER EXTENSIONS

LH AND RH EXTERIOR GRAB HANDLES WITH SINGLE RUBBER INSERT

BRIGHT FINISH RADIATOR SHELL/HOOD BEZEL

STATIONARY BLACK GRILLE WITH BRIGHT ACCENTS

CHROME HOOD MOUNTED AIR INTAKE GRILLE

FIBERGLASS HOOD WITH ACCESS HATCHES

CAB FLOOR, TOE BOARD AND FIREWALL HEAT SHIELD

VALVE AND PLUMBING FOR CUSTOMER FURNISHED AIR HORN, PIPING CAPPED AT FIREWALL

DUAL ELECTRIC HORNS

HALOGEN COMPOSITE HEADLAMPS WITH BRIGHT BEZELS

LED AERODYNAMIC MARKER LIGHTS

DAYTIME RUNNING LIGHTS

TRUCK-LITE 3 CHAMBER MODULES WITH 45 SERIES SEALED BEAM LAMPS

STANDARD FRONT TURN SIGNAL LAMPS

AUTOMATIC ON/OFF, ENGINE COMPARTMENT, HOOD ACTIVATED WORK LIGHT WITH MANUAL OVERRIDE

# BME Fire Trucks, LLC

DUAL WEST COAST MOLDED-IN COLOR HEATED MIRRORS WITH LH AND RH REMOTE  
DOOR MOUNTED MIRRORS  
102 INCH EQUIPMENT WIDTH  
LH AND RH 8 INCH MOLDED-IN COLOR CONVEX MIRRORS MOUNTED UNDER PRIMARY MIRRORS  
STANDARD SIDE/REAR REFLECTORS  
RH AFTERTREATMENT SYSTEM CAB ACCESS WITH POLISHED DIAMOND PLATE COVER  
63X14 INCH TINTED REAR WINDOW  
TINTED DOOR GLASS LH AND RH WITH TINTED NON-OPERATING WING WINDOWS  
RH AND LH ELECTRIC POWERED WINDOWS  
1-PIECE SOLAR GREEN GLASS WINDSHIELD  
8 LITER (2 GAL) WINDSHIELD WASHER RESERVOIR, CAB MOUNTED, WITH FLUID LEVEL INDICATOR  
RUGGED TRIM PACKAGE  
GRAY & CARBON VINYL INTERIOR "RUGGED"  
CARBON WITH PREMIUM GUNMETAL ACCENT (RUGGED)  
MOLDED PLASTIC DOOR PANELS  
BLACK MATS WITH SINGLE INSULATION  
ASH CUP AND (1) LIGHTER, (1) 12V POWER OUTLET  
FORWARD ROOF MOUNTED CONSOLE  
LH AND RH DOOR STORAGE POCKETS INTEGRATED INTO MOLDED DOOR PANELS  
DIGITAL ALARM CLOCK IN DRIVER DISPLAY  
(2) CUP HOLDERS LH AND RH DASH M2/SD DASH  
HEATER, DEFROSTER AND AIR CONDITIONER

# BME Fire Trucks, LLC

STANDARD HVAC DUCTING WITH PRE-FILTER FOR OUTSIDE AIR INTAKE

MAIN HVAC CONTROLS WITH RECIRCULATION SWITCH

STANDARD HEATER PLUMBING

VALEO HEAVY DUTY A/C REFRIGERANT COMPRESSOR

BINARY CONTROL, R-134A

PREMIUM INSULATION

SOLID-STATE CIRCUIT PROTECTION AND FUSES

12V NEGATIVE GROUND ELECTRICAL SYSTEM

STANDARD LED CAB LIGHTING

NO SECURITY DEVICE

DOOR LOCKS AND IGNITION SWITCH KEYED THE SAME

KEY QUANTITY OF 4

LH AND RH ELECTRIC DOOR LOCKS

BASIC ISRINGHAUSEN HIGH BACK AIR SUSPENSION DRIVERS SEAT WITH MECHANICAL LUMBAR AND INTEGRATED CUSHION EXTENSION

BASIC ISRINGHAUSEN HIGH BACK AIR SUSPENSION PASSENGER SEAT WITH MECHANICAL LUMBAR AND INTEGRATED CUSHION EXTENSION

DUAL DRIVER SEAT ARMRESTS, NO PASSENGER SEAT ARMRESTS

LH AND RH INTEGRAL DOOR PANEL ARMRESTS

BLACK VINYL DRIVER SEAT COVER

BLACK VINYL PASSENGER SEAT COVER

HIGH VISIBILITY ORANGE SEAT BELTS WITH DRIVER INDICATOR LIGHT AND AUDIBLE ALARM

ADJUSTABLE TILT AND TELESCOPING STEERING COLUMN

4-SPOKE 18 INCH (450MM) BLACK STEERING WHEEL WITH SWITCHES

# BME Fire Trucks, LLC

DRIVER AND PASSENGER INTERIOR SUN VISORS

ELECTRONIC ACCELERATOR CONTROL

NO INSTRUMENT PANEL-DRIVER

CONFIGURABLE LOWER PANEL WITH INTEGRATED UPPER STORAGE

ENGINE REMOTE INTERFACE WITHOUT INTERLOCKS

BLACK GAUGE BEZELS

LOW AIR PRESSURE INDICATOR LIGHT AND AUDIBLE ALARM WITH (1) ADDITIONAL PARK SWITCH FOR CUSTOMER USE

(1) PNEUMATIC SINGLE BRAKE APPLICATION AIR GAUGE

DUAL NEEDLE PRIMARY AND SECONDARY AIR PRESSURE GAUGE

DASH MOUNTED AIR RESTRICTION INDICATOR WITH GRADUATIONS

97 DB BACKUP ALARM

ELECTRONIC CRUISE CONTROL WITH CONTROLS ON STEERING WHEEL SPOKES

KEY OPERATED IGNITION SWITCH AND INTEGRAL START POSITION; 4 POSITION OFF/RUN/START/ACCESSORY

PREMIUM INSTRUMENT CLUSTER WITH 5.0 INCH TFT COLOR DISPLAY

DIGITAL PANEL LAMP DIMMER SWITCH IN DRIVER DISPLAY

HEAVY DUTY ONBOARD DIAGNOSTICS INTERFACE CONNECTOR LOCATED BELOW LH DASH

2 INCH ELECTRIC FUEL GAUGE

ENGINE REMOTE INTERFACE WITH ONE OR MORE SET SPEEDS

QUICKFIT POWERTRAIN INTERFACE CONNECTOR UNDER CAB WITH BLUNTCUTS

QUICKFIT PROGRAMMABLE INTERFACE CONNECTOR(S) BETWEEN SEATS WITH BLUNTCUTS

ENGINE REMOTE INTERFACE CONNECTOR AT POWERTRAIN INTERFACE CONNECTOR

# BME Fire Trucks, LLC

ELECTRICAL ENGINE COOLANT TEMPERATURE GAUGE

DIGITAL ENGINE OIL TEMPERATURE IN DRIVER DISPLAY

ELECTRIC ENGINE OIL PRESSURE GAUGE

DIGITAL TRANSMISSION OIL TEMPERATURE IN DRIVER DISPLAY

ELECTRONIC OUTSIDE TEMPERATURE SENSOR DISPLAY IN DRIVER MESSAGE CENTER

ELECTRONIC OUTSIDE TEMPERATURE SENSOR DISPLAY IN DRIVER MESSAGE CENTER

ENGINE AND TRIP HOUR METERS INTEGRAL WITHIN DRIVER DISPLAY

PTO CONTROLS FOR ENHANCED VEHICLE ELECTRIC/ELECTRONIC ARCHITECTURE

NO OBSTACLE DETECTION SYSTEM

NO DR ASSIST SYSTEM

NO VEHICLE STABILITY ADVISOR OR CONTROL

NO LANE DEPARTURE WARNING SYSTEM

NO REVERSE PROXIMITY SENSOR

NO OVERHEAD INSTRUMENT PANEL

1 QUICKFIT PROGRAMMABLE MODULE (QPM/XMC) W/ (4) 20AMP FUSED RELAYS

AM/FM/WB WORLD TUNER RADIO WITH BLUETOOTH, USB AND AUXILIARY INPUTS, J1939

DASH MOUNTED RADIO

(2) RADIO SPEAKERS IN CAB

AM/FM ANTENNA MOUNTED ON FORWARD LH ROOF

NO CB RADIO MOUNTING PROVISION

STANDARD RADIO WIRING WITH STEERING WHEEL CONTROLS

ELECTRONIC MPH SPEEDOMETER WITH SECONDARY KPH SCALE, WITHOUT ODOMETER

STANDARD VEHICLE SPEED SENSOR

# BME Fire Trucks, LLC

ELECTRONIC 3000 RPM TACHOMETER

DETROIT CONNECT PLATFORM HARDWARE

3 YEARS DAIMLER CONNECTIVITY BASE PACKAGE ON (FEATURES VARY BY MODEL) POWERED BY DETROIT CONNECT ON CUMMINS ENGINES

(2) TMC RP1226 ACCESSORY CONNECTORS: (1) LOCATED BEHIND PASSENGER SIDE REMOVABLE DASH PANEL (1) CENTER OF OVERHEAD CONSOLE

IGNITION SWITCH CONTROLLED ENGINE STOP

FOUR EXTRA HARDWIRED SWITCHES IN DASH, ROUTE TO BETWEEN SEATS, BLUNTCUT

HARDWIRE SWITCH #1, ON/OFF LATCHING, 30 AMPS BATTERY POWER

HARDWIRE SWITCH #2, ON/OFF LATCHING, 30 AMPS IGNITION POWER

HARDWIRE SWITCH #3, ON/OFF LATCHING, 20 AMPS IGNITION POWER

HARDWIRE SWITCH #4, ON/OFF LATCHING, 20 AMPS MOMENTARY POWER

PRE-TRIP INSPECTION FEATURE FOR EXTERIOR LAMPS AND SERVICE BRAKES

(2) LH AND RH FOOT SWITCHES WITH DASH SWITCH FOR HORN BUTTON TO CONTROL AIRHORN, DEFAULT TO ELECTRIC <85 PSI

NO TRAILER HAND CONTROL BRAKE VALVE

DIGITAL VOLTAGE DISPLAY INTEGRAL WITH DRIVER DISPLAY

SINGLE ELECTRIC WINDSHIELD WIPER MOTOR WITH DELAY

ROTARY HEADLAMP SWITCH, MARKER LIGHTS/HEADLIGHTS SWITCH WITH PULL OUT FOR OPTIONAL FOG/ROAD LAMPS

ALTERNATING FLASHING HEADLAMP SYSTEM WITH BODY BUILDER CONTROLLED ENGAGEMENT

ONE VALVE PARKING BRAKE SYSTEM WITH WARNING INDICATOR

SELF CANCELING TURN SIGNAL SWITCH WITH DIMMER, HEADLAMP FLASH, WASH/WIPE/INTERMITTENT

INTEGRAL ELECTRONIC TURN SIGNAL FLASHER WITH 40 AMP (20 AMP PER SIDE) TRAILER LAMP CAPACITY

# BME Fire Trucks, LLC

TWO COLOR CUSTOM PAINT – FTL-EMERGENCY 1

CAB COLOR A: L5074EY WHITE PIERCE #20

CAB COLOR B: CUSTOM

CAB COLOR B: PIERCE 117 RED

BLACK, HIGH SOLIDS POLYURETHANE CHASSIS PAINT

STANDARD E COAT/UNDERCOATING

## **CAB SEATING AND WEIGHT ALLOWANCE**

A warning label shall be installed in the cab to indicate seating positions.

## **LABELS, STANDARD PACKAGE SET**

A standard set of labels shall be provided and installed on the inside of chassis cab area. The labels shall contain the required information based on the applicable components for the apparatus.

## **DATA PLAQUE**

A data plaque shall be provided and installed on the inside of the cab. The data plaque shall contain the required information based on the applicable components for the apparatus:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Drive axle lubricant
- Power steering fluid
- Pump, generator, or other component lubrications
- Other NFPA applicable fluid levels or data as required
- Paint manufacturer, type, and color number
- Tire Speed Ratings

## **DATA PLAQUE**

A data plaque shall be provided and installed. The plaque shall contain the following information.

- Pump make and model
- GPM capacity rating

## BME Fire Trucks, LLC

- Truck serial and production number
- Pump performance (specific GPMs at rated pressures with engine RPM)
- Governed engine RPM
- Pump gear ratio

### **WARNING LABEL -- NO RIDING ON REAR**

A warning label stating: "WARNING: DO NOT RIDE ON REAR STEP WHILE VEHICLE IS IN MOTION. DEATH OR SERIOUS INJURY MAY RESULT" shall be installed on the rear of the apparatus. The label shall be applied to the vehicle at the rear step area. The label shall warn personnel that riding in or on these areas, while the vehicle is in motion, is prohibited.

### **WARNING LABEL -- OCCUPANT SEATED AND BELTED**

A warning label for occupants seated to be belted shall be mounted in a location visible to all occupants of the cab. The label shall meet FAMA07 standards.

Label shall read "Crash hazard occupants must be seated and belted when vehicle is in motion. Use only OEM approved belts. Unbelted occupants are at greater risk of injury or death in a crash."

### **WARNING LABEL -- SIREN NOISE**

A warning label for siren noise {will/shall} be located inside driver cab door. The label shall comply with FAMA42 standards.

Label shall read, "Sirens produce loud sounds that may damage hearing. Roll up windows. Wear hearing protection. Use only for emergency response. Avoid exposure to siren sound outside of vehicle."

### **WARNING LABEL -- HELMET WORN IN CAB**

A warning label for wearing helmet in cab shall be located visible from each seating location. The label shall comply with FAMA43 standards.

The label shall read, "Cash Hazard. Do not wear helmet while seated unless necessary during suppression operations. Serious head or neck injury may result from helmet use in cab. Failure to comply may injure or kill."

### **AIR FILTER EMBER PROTECTION SCREEN WARNING LABEL**

A warning label, stating: "THIS VEHICLE HAS AN AIR INTAKE EMBER SCREEN WHICH REQUIRES PERIODIC INSPECTION & CLEANING" shall be provided and installed in the apparatus cab interior.

# BME Fire Trucks, LLC

## **FRESH AIR EMBER SEPARATOR WARNING LABEL**

A warning label, stating: “THIS APPARATUS IS EQUIPPED WITH A CAB FRESH AIR INTAKE EMBER PROTECTION SCREEN. ROUTINE INSPECTION IS REQUIRED.” shall be provided and installed in the apparatus cab interior.

## **MANUFACTURER LOGO**

The apparatus shall include a BME logo plaque which shall be affixed at the rear of the apparatus.

The BME plaque shall feature white reflective material on the outside of the Maltese cross and red reflective material in the middle.

## **FRONT TOWING PROVISIONS**

Two (2) front towing provisions shall be installed by the chassis manufacturer.

## **REAR TOW EYES**

Two (2) bolt-on tow eyes shall be installed at the rear of the chassis. The tow eyes shall be painted or powder coated gloss black.

## **AIR HORN**

One (1) Buell brand, Model #1063 15" air horn shall be provided and mounted on the frame rail of the passenger's side frame, behind the bumper.

## **AIR HORN FOOT SWITCH**

One (1) foot switch shall be provided and installed. The foot switch shall be located on the driver's side of the floor and shall activate the air horn system.

## **EXHAUST SYSTEM MODIFICATION**

The chassis exhaust system shall be modified to exit on the passenger side of the apparatus ahead of the rear wheel.

## **REAR MUD FLAPS**

The chassis shall be supplied with mud flaps with BME's logo. The mud flaps shall be installed behind the rear wheels.

# BME Fire Trucks, LLC

## **CAB DOOR REFLECTIVE PANELS**

The cab doors shall include reflective white trim installed inside each door.

Specified part shall include Red and White DOT approved reflective striping.

## **FRONT AIR RIDE SEATS**

### **CAB SEATING**

The apparatus shall be equipped with two (2) Bostrom Sierra 100 air ride seats. The seats shall have an inside arm rest.

The specified seat(s) covers shall be dark grey vinyl.

## **UNDERHOOD LIGHTS**

There shall be two (2) Tecniq LED light(s) installed under the hood of the chassis. Lights shall have local switching on the driver side under the hood.

## **AIR FILTER EMBER PROTECTION SCREEN AND WARNING LABEL**

The chassis air intake shall be protected by an ember guard of 18 Mesh, 0.017-inch wire diameter, and a maximum mesh opening of 0.039 inches. The ember guard shall be sized to fit and located at the intake opening. The screen shall be readily accessible for inspection and maintenance.

## **EMBER SEPARATOR -- FRESH AIR INTAKE TO CAB**

The cabin air filter shall be protected by an ember guard with a maximum mesh opening of 0.039 inches.

## **OEM TINTED CAB WINDOWS**

The cab windows shall remain as tinted by the OEM chassis manufacturer for UV resistance only, no aftermarket tinting shall be done.

## **TIRE PRESSURE INDICATOR SYSTEM**

There shall be a tire pressure indicator at each road tire's valve stem on the vehicle. The indicators shall provide LED indication if there is insufficient pressure in the specific tire.

## **FIRE PUMP SPECIFICATIONS**

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A Waterous model CSUC22, 1500 GPM single stage centrifugal pump shall be designed to mount on the chassis frame rails and shall be split-drive shaft driven. The pump casing shall be of high-tensile, close-grained gray iron. Pump body shall be horizontally split in two (2) sections, for easy removal of impeller assembly including wear rings and bearings from beneath the pump without disturbing the mounting or piping.

A matched bronze impeller specifically designed for the fire service will be provided. It shall be accurately balanced both mechanically and hydraulically, for vibration-free operation. Stainless steel heat-treated and precisely ground to size. It shall be supported on both ends by oil or grease lubricated ball bearings.

Replaceable wear rings, bronze, reverse-flow, labyrinth-type shall be provided. Three (3) deep groove ball bearings shall be located outside the pump to give rugged support and proper alignment to the impeller shaft. The bearings shall be oil or grease lubricated. All bearings shall be completely separated from the water being pumped. Located on the impeller shaft between stuffing boxes and bearing housing shall be provided.

The housing shall be constructed of high tensile aluminum and be of three (3) piece, horizontally split design. The transmission driveline shafts shall be made from alloy steel forged, hardened and ground to size. The drive and driven sprockets shall be made of steel and shall be carbonized and hardened. The drive chain shall be Morse HV in volute form chain. The lubrication system shall be impeller shaft driven oil pumps to deliver oil to an integral spray header, to completely pressure lubricate the drive chain.

A pump bearing grease fitting shall be provided in the pump enclosure. Fitting shall have a protective dust cap and shall be properly labeled. The pump shall be bolted to steel angles in pump module, using grade 8 bolts.

## **FIRE PUMP WARRANTY**

A seven (7) year warranty on the Waterous fire pump shall be provided. The provisions of this warranty shall be described in the completed apparatus documentation.

## **PRIMING SYSTEM**

A Waterous model #VPOS electrically driven, positive displacement, rotary vane type 'oil less' priming pump shall be installed. The pump shall be capable of taking suction and discharging water with a lift of 10 feet in not more than 30 seconds with the pump dry, through 20 feet of suction hose of appropriate size. It shall be capable of developing a vacuum of 22" at an altitude of up to 1000 feet. The system shall be activated with a push button switch.

## **PRIMING VALVE**

A Waterous model #82507-2T VAP priming valve shall be installed on the apparatus.

## **FIRE PUMP SHIFT**

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The fire pump shall be equipped with an air operated pump shift, pneumatically controlled using a power-shifting cylinder. The Waterous air shift control valve shall be mounted in the cab. The fire pump-shift system shall be equipped with a means to prevent unintentional movement of the control device from its set position. The system shall include a nameplate indicating the chassis transmission shift selector position to be used for pumping and located so that it can be easily read from the driver's position.

The system shall have required indicator and interlock systems shall be installed as required by the pump manufacturer and applicable NFPA standards.

The system shall include all required interlocks and pump shift and OK TO PUMP indicator lights in the cab and pump panel. The fire pump system shall be equipped with an interlock system shall be provided to ensure that the pump drive system components are properly engaged in the pumping mode of operation so that the pumping system can be safely operated from the pump operator's position. The secondary braking device shall be automatically disengaged for pumping operations.

## **THIRD PARTY FIRE PUMP TEST**

The pump shall undergo an Underwriters Laboratories Incorporated witnessed and certified test per applicable sections of NFPA 1900 standards, prior to delivery of the completed apparatus. The UL acceptance certificate shall be furnished with the apparatus on delivery. No exceptions to UL testing, no other third party agency shall be acceptable.

## **FIRE PUMP DRIVE LINE INSTALLATION**

The mid-ship fire pump shall be installed with constant heavy duty #1810 drive shafts with vibration free angles to the rear axle.

## **INTAKE DUMP VALVE**

An Waterous brand intake dump valve shall be provided and mounted on the suction side of the pump. The discharge piping of the dump valve shall be a minimum of 2-1/2" diameter and shall terminate with a 2-1/2" male NST adapter. The excess water shall be discharged to the ground. A label shall be provided indicating: "DUMP VALVE DISCHARGE, DO NOT CAP".

## **BYPASS FIRE PUMP COOLER**

The fire pump shall be equipped with a cooling line, the line shall be routed through the main and auxiliary pump (if applicable) to an adjustable valve, from the valve the water shall be routed through the apparatus' engine cooling system and then to the water tank. The valve on the pump panel shall be labeled "Engine Cooler".

## **PLUMBING- GENERAL**

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The plumbing system shall utilize stainless steel piping incorporating hosing to allow for flex. The piping shall utilize TIG welding to provide a complete seal. Hard angles shall be avoided when possible to improve water flow characteristics. The piping shall utilize Victaulic couplers whenever possible to allow flex as the body module flexes.

Threaded sections of piping shall be avoided to reduce the leak potential of the system. Victaulic couplers shall be used in place of threading to reduce leak potential. Schedule 10 stainless steel piping shall be used for transport type piping. Schedule 40 stainless steel shall be used for areas requiring threading to provide a stable threading base. Brackets shall be installed to support threading locations thereby reducing the potential for leaks.

All hoses shall be connected directly to the tank due to the different flex ratios of the tank to body. Any front discharges, any rear discharges, and all cross lays shall use hose to reach the actual discharge. The use of hose shall be utilized due to the difference in flex or movement between the discharge location and the pump connection. Drain lines shall be provided at the lowest points in the plumbing system to allow for complete drainage. Bleeders shall be provided for all gauges to relieve pressure after use. Push/ pull handles shall be provided for all bleeders and the primer control.

## **6" UNGATED INTAKE -- LEFT SIDE**

One (1) 6" un-gated suction intake shall be installed on the left side pump panel to supply the fire pump from an external water supply. The threads shall be 6" NH male and equipped with a removable screen.

One (1) chrome brass 6" NH long handle cap shall be installed on the intake.

## **6" UNGATED INTAKE -- RIGHT SIDE**

One (1) 6" un-gated suction intake shall be installed on the right side pump panel to supply the fire pump from an external water supply. The threads shall be 6" NH male and equipped with a removable screen.

One (1) chrome brass 6" NH long handle cap shall be installed on the intake.

## **2-1/2" GATED INTAKE -- LEFT SIDE**

One (1) 2-1/2" gated suction intake shall be recessed mounted on the left side pump panel to supply the fire pump from an external water supply. The valve shall be a quarter-turn ball valve with the appropriate handle and shall have 2-1/2" NH female thread.

The intake shall be equipped with a South Park Corp. 3/4" Push-pull type drain valve mounted to the bottom of the valve.

One (1) Akron 8825 series swing-out style valve(s) shall be supplied and installed. All valves shall be designed

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to operate under normal conditions up to 500 PSI and shall have dual seats to work in both pressure and vacuum environments. All valves and controls shall be easily accessible for service, repair or replacement.

The specified valve shall have a direct actuated 'local' control Akron Model TSC valve handle.

One (1) chrome brass 2-1/2" NH rocker lug plug with a securing chain or cable shall be installed on the intake.

### **2-1/2" GATED INTAKE -- RIGHT SIDE**

One (1) 2-1/2" gated suction intake shall be recess mounted on the right side pump panel to supply the fire pump from an external water supply. The valve shall be a quarter-turn ball valve with the appropriate handle and shall have 2-1/2" NH female thread.

The intake shall be equipped with a South Park Corp. 3/4" Push-pull type drain valve mounted to the bottom of the valve.

One (1) Akron 8825 series swing-out style valve(s) shall be supplied and installed. All valves shall be designed to operate under normal conditions up to 500 PSI and shall have dual seats to work in both pressure and vacuum environments. All valves and controls shall be easily accessible for service, repair or replacement.

The specified valve shall have a direct actuated 'local' control Akron Model TSC valve handle.

One (1) chrome brass 2-1/2" NH rocker lug plug with a securing chain or cable shall be installed on the intake.

### **WATER TANK SUPPLY LINE TO FIRE PUMP**

One (1) 4" water tank to pump line shall be installed with a 4" full flow quarter turn ball valve and 4" piping. The line shall be equipped with a hump hose with stainless steel hose clamps and a 4" full flow check valve to prevent pressurization of the water tank.

One (1) Akron 8840 series swing-out style valve(s) shall be supplied and installed. All valves shall be designed to operate under normal conditions up to 500 PSI and shall have dual seats to work in both pressure and vacuum environments. All valves and controls shall be easily accessible for service, repair or replacement. The valve shall be operated by an electric actuator.

The specified electric valve shall be controlled with a Navigator Pro 2.0 9333 controller.

### **PUMP TO TANK**

One (1) 2" pump to tank line shall be installed with a 2" full flow quarter turn ball valve and 2" piping.

One (1) Akron 8820 series swing-out style valve(s) shall be supplied and installed. All valves shall be designed

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to operate under normal conditions up to 500 PSI and shall have dual seats to work in both pressure and vacuum environments. All valves and controls shall be easily accessible for service, repair or replacement.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

### **2-1/2" DISCHARGE LEFT SIDE -- REARWARD PUMP PANEL**

(2) 2-1/2" discharge shall be installed on the left side rearward pump panel area with controlled by a quarter turn ball valve. The discharge shall have 2-1/2" NH male hose threads and label adjacent the control handle.

The discharge outlet shall be equipped with an Innovative Controls 3/4" bleeder assembly with side stem lever control.

Two (2) Akron 8825 series swing-out style valve(s) shall be supplied and installed. All valves shall be designed to operate under normal conditions up to 500 PSI and shall have dual seats to work in both pressure and vacuum environments. All valves and controls shall be easily accessible for service, repair or replacement.

The specified valve shall have a direct actuated 'local' control Akron Model TSC valve handle.

(2) chrome plated brass 30 degree elbow with 2.5" swivel female NH x 2.5" male NH thread with rocker lugs shall be provided on the discharge.

Two (2) chrome brass 2.5" NH rocker lug cap with a securing chain or cable shall be installed on the discharge.

The line discharge water pressure gauge(s) shall be Innovative Controls model# 3010353-40003. The gauges shall have a 2" diameter face with a graduated output scale of 0-600 PSI. The gauge shall be mounted within 6" of the control device with a name plate label.

The specified gauge shall feature a drain located at the gauge inlet to help prevent freezing. The drain shall be a twist open and close type.

Gauge(s) shall include internal, back-lit 12 volt lighting. Replaceable, White, LED bulb in a water-resistant holder.

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Gauge(s) shall be supplied with a white dial face with black lettering and black gauge marks.

### **2-1/2" DISCHARGE RIGHT SIDE --FORWARD PUMP PANEL**

One (1) 2-1/2" discharge shall be installed on the right side forward pump panel area with controlled by a quarter turn ball valve. The discharge shall have 2-1/2" NH male hose threads and label adjacent the control handle.

The discharge outlet shall be equipped with an Innovative Controls 3/4" bleeder assembly with side stem lever control.

One (1) Akron 8825 series swing-out style valve(s) shall be supplied and installed. All valves shall be designed to operate under normal conditions up to 500 PSI and shall have dual seats to work in both pressure and vacuum environments. All valves and controls shall be easily accessible for service, repair or replacement.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

(1) 2-1/2" IC discharge pressure gauges (0-600 PSI) shall be provided. The face of the gauge shall be a white dial with black letters. The gauges will be located on the pump instrument panel.

The specified gauge shall feature a drain located at the gauge inlet to help prevent freezing. The drain shall be a twist open and close type.

Gauge(s) shall include internal, back-lit 12 volt lighting. Replaceable, White, LED bulb in a water-resistant holder.

Gauge(s) shall be supplied with a white dial face with black lettering and black gauge marks.

(1) chrome plated brass 30 degree elbow with 2.5" swivel female NH x 2.5" male NH thread with rocker lugs shall be provided on the discharge.

One (1) chrome brass 2.5" NH rocker lug cap with a securing chain or cable shall be installed on the discharge.

### **4" DISCHARGE RIGHT SIDE -- FORWARD PUMP PANEL**

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One (1) 4" discharge shall be installed on the right side forward pump panel area with controlled by a slow close 4" quarter turn ball valve. The discharge shall have 4" NH male hose threads and label adjacent the control handle.

The discharge outlet shall be equipped with an Innovative Controls 3/4" bleeder assembly with side stem lever control.

One (1) Akron 8840 series swing-out style valve(s) shall be supplied and installed. All valves shall be designed to operate under normal conditions up to 500 PSI and shall have dual seats to work in both pressure and vacuum environments. All valves and controls shall be easily accessible for service, repair or replacement. The valve shall be operated by an electric actuator.

The specified electric valve shall be controlled with a Navigator Pro 2.0 9333 controller.

One (1) chrome plated brass 30 degree elbow with 4" swivel female NH x 4" male NH thread with rocker lugs shall be provided on the discharge.

One (1) chrome plated brass 4" NH rocker lug cap with a securing chain or cable shall be installed on the discharge.

The line discharge water pressure gauge(s) shall be Innovative Controls model# 3010353-40003. The gauges shall have a 2" diameter face with a graduated output scale of 0-600 PSI. The gauge shall be mounted within 6" of the control device with a name plate label.

The specified gauge shall feature a drain located at the gauge inlet to help prevent freezing. The drain shall be a twist open and close type.

Gauge(s) shall include internal, back-lit 12 volt lighting. Replaceable, White, LED bulb in a water-resistant holder.

Gauge(s) shall be supplied with a white dial face with black lettering and black gauge marks.

## **2.5" DISCHARGE -- REAR RIGHT**

One (1) 2.5" discharge shall be installed on the rear right panel with controlled by a quarter turn ball valve. The discharge shall have 2.5" NH male hose threads and nameplate label adjacent the control handle.

The discharge outlet shall be equipped with an Innovative Controls 3/4" bleeder assembly with side stem lever control.

One (1) Akron 8825 series swing-out style valve(s) shall be supplied and installed. All valves shall be designed

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to operate under normal conditions up to 500 PSI and shall have dual seats to work in both pressure and vacuum environments. All valves and controls shall be easily accessible for service, repair or replacement.

For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

(1) 2-1/2" IC discharge pressure gauges (0-600 PSI) shall be provided. The face of the gauge shall be a white dial with black letters. The gauges will be located on the pump instrument panel.

The specified gauge shall feature a drain located at the gauge inlet to help prevent freezing. The drain shall be a twist open and close type.

Gauge(s) shall include internal, back-lit 12 volt lighting. Replaceable, White, LED bulb in a water-resistant holder.

Gauge(s) shall be supplied with a white dial face with black lettering and black gauge marks.

(1) chrome plated brass 30 degree elbow with 2.5" swivel female NH x 2.5" male NH thread with rocker lugs shall be provided on the discharge.

One (1) chrome brass 2.5" NH rocker lug cap with a securing chain or cable shall be installed on the discharge.

### **1-1/2" CROSSLAY DISCHARGE**

There shall be two (2) pre-connect 1-1/2" hose cross lays installed over pump enclosure. The outlets shall be equipped with a 1-1/2" NPT female chickens swivel x 1-1/2" male NH hose threads. The hose bed decking shall be constructed with a removable slatted material. The bed shall be approximately 8" wide, 14" deep, and 72" right to left over the pump enclosure area. The hose beds shall provide a minimum capacity of 200 feet of 1-3/4" diameter double jacket hose with nozzle provided by fire department.

Two (2) Akron 8820 series swing-out style valve(s) shall be supplied and installed. All valves shall be designed to operate under normal conditions up to 500 PSI and shall have dual seats to work in both pressure and vacuum environments. All valves and controls shall be easily accessible for service, repair or replacement.

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For valve actuation, the specified discharge shall be equipped with a side mount valve control. The ergonomically designed 1/4 turn push-pull T-handle shall be chrome plated zinc with recessed labels for color coding and signage. The gear-control rod, double laminated locking clips, and rod housing shall be stainless steel and provide true positive lock that will eliminate valve drift. Bronze and Teflon impregnated stainless steel bushings in both ends of rod housing shall eliminate rod deflection, never need lubrication and ensure consistent long-term operation.

The control assembly shall include a decorative chrome-plated zinc panel mounted bezel with recessed color-coded label.

(2) 2-1/2" IC discharge pressure gauges (0-600 PSI) shall be provided. The face of the gauge shall be a white dial with black letters. The gauges will be located on the pump instrument panel.

The specified gauge shall feature a drain located at the gauge inlet to help prevent freezing. The drain shall be a twist open and close type.

Gauge(s) shall include internal, back-lit 12 volt lighting. Replaceable, White, LED bulb in a water-resistant holder.

Gauge(s) shall be supplied with a white dial face with black lettering and black gauge marks.

The crosslay hosebed shall be equipped with an aluminum diamond plate hinged cover and vinyl end flap enclosures on each side, installed in compliance with applicable NFPA #1900 standards. The cover shall be equipped with rubber bumpers and lift up handle on each end of the cover.

The specified crosslay/deadlay flaps shall be red.

### **CROSSLAY EDGES**

The crosslay side sheets shall be rolled on each side to act as a guide for the hose to come out of the tray.

The specified outlet(s) shall be equipped with a 1-1/2" NPT female chickens swivel x 1-1/2" male NH hose threads.

Front Bumper Discharge Options

### **MONITOR DISCHARGE**

One (1) 3" monitor discharge shall be installed over the pump enclosure. The discharge shall be controlled by a slow close 3" quarter turn ball valve. The discharge shall terminated with 3" hose threads or Victaulic coupling.

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The discharge outlet shall be equipped with an Innovative Controls 3/4" bleeder assembly with side stem lever control.

One (1) Akron 8630 series swing-out style valve(s) shall be supplied and installed. All valves shall be designed to operate under normal conditions up to 500 PSI and shall have dual seats to work in both pressure and vacuum environments. All valves and controls shall be easily accessible for service, repair or replacement. The valve shall be operated by an electric actuator.

The specified electric valve shall be controlled with a Navigator Pro 2.0 9333 controller.

**NO-** Deck gun is included with this discharge.

The line discharge water pressure gauge(s) shall be Innovative Controls model# 3010353-40003. The gauges shall have a 2" diameter face with a graduated output scale of 0-600 PSI. The gauge shall be mounted within 6" of the control device with a name plate label.

The specified gauge shall feature a drain located at the gauge inlet to help prevent freezing. The drain shall be a twist open and close type.

Gauge(s) shall include internal, back-lit 12 volt lighting. Replaceable, White, LED bulb in a water-resistant holder.

Gauge(s) shall be supplied with a white dial face with black lettering and black gauge marks.

### **FOAM SYSTEM**

A FoamPro #2001 electronic foam system shall be provided. The system shall be designed for use with Class A foam concentrate. The foam proportioning operation shall be designed for direct measurement of water flows and shall remain consistent within the specified flows and pressures. The system shall be capable of accurately delivering foam solution as required by applicable sections of the NFPA standards.

The system shall be equipped with a control module suitable for installation on the pump panel. There shall be a microprocessor incorporated within the motor driver that shall receive input from the system's flow meter, while also monitoring the foam concentrate pump output. The microprocessor shall compare the values to ensure that the desired amount of foam concentrate is injected onto the discharge side of the fire pump. A "foam capable" paddlewheel-type flow meter shall be installed in the discharge side of the piping system.

The control module shall enable the pump operator to:

1. Activate the foam proportioning system
2. Select the proportioning rates from 0.1% to 3.0%

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3. Display a "Lo Con" warning when the foam tank level becomes low and in two (2) minutes, if the foam concentrate has not been added to the tank, the foam concentrate pump shall be capable of shutting down.
4. Display the current flow rate of water or foam solution per minute.
5. Display the total amount of water or foam pumped (resetable).
6. Display the foam concentrate injection rate setting.

A 12 volt electric motor driven positive displacement plunger pump shall be provided. The pump capacity range shall be 0.1 to 2.6 GPM at 150 PSI with a maximum operating pressure up to 400 PSI. The system shall draw a maximum of 40 amps at 12 volts. The motor shall be controlled by the microprocessor which shall be mounted to the base of the pump. It shall receive signals from the control module and power the 1/2 horsepower electric motor in a variable speed duty cycle to ensure that the correct proportion of concentrate is injected into the water stream.

A full flow check valve shall be provided in the discharge piping to prevent foam contamination of the fire pump and water tank. A minimum 11 PSI opening pressure check valve shall be provided in concentrate line.

Components of the complete proportioning system as described above shall include:

1. Operator control module
2. Paddlewheel flow meter
3. Pump and electric motor/motor driver
4. Wiring harnesses
5. Low level tank switch
6. Foam injection check valve
7. Main waterway check valve
8. Flow meter with paddle wheel

The foam system shall be installed and calibrated to manufacturer's requirements. In addition the system shall be tested and certified by the apparatus manufacturer to meet applicable NFPA standards.

The foam system design shall be tested and pass environmental testing in accordance to SAE standards.

An installation and operation manual shall be provided for the unit.

The FoamPro 2001 Series foam system shall be provided with a FoamPro control cable from the controller to the foam pump assembly. The FoamPro 2001 Series foam system shall be provided with a standard pump panel mounted FoamPro control head.

The flow meter shall be installed in the "foam capable" discharge piping.

The foam system shall have a pump operator's panel-mounted digital control module that shall provide a constant readout of GPM of water, foam solution, concentrate rate and totals of quantities being discharged at

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any time during operation. The total readable figure shall be 99,999 gallons. The foam system shall be capable of being calibrated from the pump operator's panel. Diagnostic testing shall be provided in the readout from the instruments on the pump operator's panel.

A FoamPro foam system schematic label shall be installed on the pump panel near foam controls. The label shall be a diagram of the FoamPro 2001 foam system layout and shall meet applicable sections of the NFPA standards.

Foam concentrate shall be provided from the onboard foam concentrate storage tank. The system shall be compatible with nozzle aspirating systems, where nozzle flow volumes must be adjustable on demand, while maintaining a constant quality foam solution.

### **FOAM SYSTEM OUTLETS**

The following discharges shall have foam distributed to them.

- Front bumper discharges (If applicable)
- Front bumper monitor (If applicable)
- Booster hose reel (If applicable)
- 1-1/2" Cross lays
- Rear 2-1/2" discharge
- Right side 2-1/2" discharge
- 3" Top Monitor (If applicable)

A 3/4" PVC fitting shall be provided on the foam tank for connection of the foam tank to the suction side of the foam system.

### **PUMP ENCLOSURE**

The mid-ship fire pump enclosure shall be a separate unit from the body unit and shall be attached and supported at the chassis frame rails. This module shall allow independent flexing of the pump enclosure from the body, chassis, tank, and shall permit quick removal. The module shall have plastic or rubber mounting pads and shall be attached to the frame rails with spring mountings. The support structure shall be constructed of #6061 aluminum channel, tubing and angle.

The "module" enclosure shall allow for removal of valves, piping, and fire pump in a single unit, with a minimum number of components to be disassembled. The right and left side panels, front panel, and floor above the plumbing system shall be bolted and easily removable.

The pump enclosure shall be approximately 50" front to rear, 72" right to left, and 70" high with a left side mounted pump panel.

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## **PUMP ENCLOSURE RUNNING BOARD**

Both the drivers and passenger side shall be equipped with a side running board. The running board shall extend along the width of the pump enclosure from the forward end of the body module to behind the chassis cab. The exterior edge of the running board shall be constructed of a non-slip aggressive surface, supported by the pump enclosure framework, and bolted in place with stainless steel fasteners.

## **PUMP ACCESS SERVICE DOOR -- UPPER LEFT SIDE**

The upper left side of the side mount pump enclosure shall be provided with a pump service access door. The hinged door shall be constructed of stainless steel with a brushed finish.

## **DOOR LATCH**

The specified hinged door(s) shall be equipped with (2), textured chrome lever latch(es). Latch(es) shall be non-locking style with a raised button.

## **PUMP ACCESS SERVICE DOOR -- UPPER RIGHT SIDE**

The upper right side of the side mount pump enclosure shall be provided with a pump service access door. The hinged door shall be constructed of stainless steel with a brushed finish.

## **DOOR LATCH**

The specified hinged door(s) shall be equipped with (2), textured chrome lever latch(es). Latch(es) shall be non-locking style with a raised button.

## **PUMP PANEL-LEFT SIDE**

The pump panel shall be constructed of stainless steel, and bolted to the pump enclosure with stainless steel fasteners. Discharges and intakes shall feature a bezel to aid in removal of panel for maintenance and repairs.

## **PUMP PANEL-RIGHT SIDE**

The pump panel shall be constructed of stainless steel, and bolted to the pump enclosure with stainless steel fasteners. Discharges and intakes shall feature a bezel to aid in removal of panel for maintenance and repairs.

## **MASTER PRESSURE CENTER - GAUGE SET**

One (1) master pressure gauge set (discharge pressure and intake gauge), with labels shall be provided on the pump instrument panel. The set shall be an Innovative Controls Master Pressure Center and shall incorporate one (1) 4" master intake pressure gauge, one (1) 4" master discharge pressure gauge, an audible alarm, and one

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(1) set of vacuum/pressure test taps into an integrated, bezeled platform.

The specified gauge shall feature a drain located at the gauge inlet to help prevent freezing. The drain shall be a twist open and close type.

Gauge(s) shall include internal, back-lit 12 volt lighting. Replaceable, White, LED bulb in a water-resistant holder.

Gauge(s) shall be supplied with a white dial face with black lettering and black gauge marks.

## **PRESSURE GOVERNOR and ENGINE MONITORING DISPLAY**

Fire Research PumpBoss Max series PBA504-C10 pressure governor and control module kit shall be installed. The kit shall include a control module, discharge pressure sensor, and cables. The control module housing shall be waterproof and have dimensions not to exceed 7 1/2" high by 3 5/8" wide. The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 2" from the front of the control module. The control LCD shall be 3.5" in size with a minimum brightness of 1000 nits and optically bonded to 3mm Borofloat Glass. Inputs for monitored engine information shall be from a J1939 data bus. Outputs for engine control shall be on the J1939 data bus. Inputs from the pump discharge pressure sensor shall be electrical.

The following continuous displays shall be provided:

- Engine RPM; shown on LCD screen
- Check engine and stop engine warning; shown on LCD screen
- Engine oil pressure; shown on LCD screen
- Engine coolant temperature; shown on LCD screen
- Transmission Temperature; shown on LCD screen
- Battery voltage; shown on LCD screen
- Pressure and RPM operating mode LEDs
- Pressure / RPM setting; shown on LCD screen
- Throttle ready / Ok to Pump LEDs.

On screen (LCD) message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. LCD Screen and LED's intensity shall be automatically adjusted for day and nighttime operation.

The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- High Battery Voltage
- Low Battery Voltage (Engine Off)
- Low Battery Voltage (Engine Running)
- High Transmission Temperature
- Low Engine Oil Pressure
- High Engine Coolant Temperature

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Out of Water (visual alarm only)

No Engine Response (visual alarm only).

The program features shall be accessed via push buttons located on the front of the control module. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.

The pressure governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready and Ok to Pump LED shall light when the interlock signal is recognized. The pressure governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the pressure governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The pressure governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of low water and no water conditions with an automatic programmed response and a push button to return the engine to idle.

The pressure governor control module shall be programmed at installation for a specific engine.

## **WATER TANK GAUGE**

IC Soft-Glo Tank Level Monitor System Innovative Controls Soft-Glo Series Tank Level Monitors shall be installed. The system shall be CAN Bus capable and include a variety of electronic display modules and CAN extension cables. The display modules are divided into 4 distinct sections that show the volume of (Water or Class A Foam or Class B Foam) in the tank using multi-color and programmable superbright LEDs. Tank level indication is enhanced by the use 180° wide-angle diffusion lenses in front of the LEDs. The LEDs are diffused by a proprietary method that creates an illumination effect that remains bright but eliminates the typical irritation to an operator's eyes traditionally caused by bright LEDs.

The specified tank level gauge shall feature a blue bezel.

The specified level gauge shall be active anytime the chassis battery switch is turned on.

## **FOAM TANK GAUGE**

IC Soft-Glo Tank Level Monitor System Innovative Controls Soft-Glo Series Tank Level Monitors shall be installed. The system shall be CAN Bus capable and include a variety of electronic display modules and CAN extension cables. The display modules are divided into 4 distinct sections that show the volume of (Water or Class A Foam or Class B Foam) in the tank using multi-color and programmable superbright LEDs. Tank level indication is enhanced by the use 180° wide-angle diffusion lenses in front of the LEDs. The LEDs are diffused by a proprietary method that creates an illumination effect that remains bright but eliminates the typical irritation to an operator's eyes traditionally caused by bright LEDs.

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The specified tank level gauge shall feature a green bezel.

The specified level gauge shall be active anytime the chassis battery switch is turned on.

## **NOMENCLATURE PLATES**

The apparatus shall be equipped with color coded labels. The labels shall be furnished for discharges, intakes, and for other controls and indicators. All labels shall be in English format.

## **MIDSHIP PUMP PANEL LIGHTS -- DRIVERS SIDE**

There shall be three Tecniq brand LED lights installed under a stainless steel light shield mounted above the pump panel. The two outer lights shall be operated by a panel mounted switch, while the middle light will only be activated upon pump engagement.

One (1) of the pump panel lights shall illuminate at the time the fire pump is engaged.

## **MIDSHIP PUMP PANEL LIGHTS -- PASSENGER SIDE**

There shall be three Tecniq brand LED lights installed under a stainless steel light shield mounted above the pump panel. The two outer lights shall be operated by a panel mounted switch, while the middle light will only be activated upon pump engagement.

One (1) of the pump panel lights shall illuminate at the time the fire pump is engaged.

## **DESIGN AND SCOPE OF TANKER/TENDER BODY**

The body shall be designed and constructed of commonly available structural components for ease of repair and maintenance. The body shall be of a modular design with the body structure independent of the chassis frame rails. The body module shall be mounted to the chassis frame rails utilizing a unique double spring mounting system for flexibility and durability over the lifetime of the apparatus. The fabrication of the body shall be of welded construction to withstand the rigors of fire service use.

The body shall be designed to incorporate and support the tank, hose bed, compartments, and all other equipment intended to be stored in or mounted to the body module. The body skeleton and compartment framework shall be designed of tubular members for increased strength and stress resistance. There shall be no sheet metal or extrusions utilized in the foundation or structural components of the body module due to their critical role in assuring lifetime durability, functionality and usability.

## **BODY FRAMEWORK**

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The entire body framework shall be fabricated of 6061-T6 aluminum architectural style tubing. The body framework shall be a completely welded unit, forming a connected, stable frame for strength, longevity and providing the skeleton of the body module. The internal upright members of the framework shall act as support for the top layer of the body module. The external upright members shall act as an exoskeleton providing form and support for compartments while acting as the external surfaces of the module. The framework shall define the compartment openings and provide a rigid mounting location for all compartments and doors.

The foundation cross-members shall be placed perpendicular to the chassis frame rails in the wheel well area extending the full width of the body and shall be constructed of 3 inch high x 2 inch wide x .250 inch tubing. The foundation members parallel to the chassis frame rails shall be constructed of 3 inch square x .250 inch tubing and shall connect the foundation cross members and extend the full length of the body.

All tank support cross members shall be placed to support the water tank as per the tank manufacture's recommendation. These supports shall be constructed of 3 inch high x 2 inch wide x .250 inch aluminum tubing. The tank support angles shall be constructed of 4 inch x 4 inch x .250 inch thick angles and shall be placed at the tank sides parallel to the chassis frame rails to provide lateral support for the tank and protection from debris from the wheels.

The internal upright supports for top layer components shall be placed to provide support for all components located on the top layer of the body module and shall be constructed of aluminum tubing measuring 2 inch square x .250 inch wall thickness. All front to rear connecting members shall be 3 inches high x 2 inches wide x .125 inch wall thickness and shall be placed in between the interior upright support members to provide rigidity, stability and support to all top layer components. All gussets shall be constructed of 2 inches high x 3 inches wide x .250 inch thick plate which shall be placed on the top and bottom of the foundation cross members where they intersect with the exterior members.

## **BODY MOUNTING SYSTEM**

The mounting assembly shall be designed to isolate and protect the body module from vibration and twisting stresses imparted by the flexing of the chassis frame rails. The body module shall employ spring loaded body mounting assemblies. Each two piece mounting assembly shall be designed to positively position the body on the frame rails while allowing lateral and forward or aft movement. Mounting assemblies shall be placed forward and rearward of the rear axle as necessary to provide a strong and stable mounting of the body module. Each mounting assembly shall consist of a "male" upper mounting bracket and a "female" lower mounting bracket.

## **BODY MATERIAL**

All materials utilized shall be of the correct type, alloy, and thickness to withstand the intended usage and provide protection against cracking, corrosion or metal fatigue. The body compartments shall be fabricated using .125 inch 5052-H32 aluminum for most compartments unless otherwise stated. Any use of proprietary parts or materials in the construction of the body shall be unacceptable, due to potential delays or difficulties in

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an unlikely event of future repairs or when service becomes necessary.

All external upright supports for integral compartments shall incorporate a second set of upright supports constructed of 3 inch wide x 2 inch deep x .250 inch wall thickness and shall be located outboard of the internal upright supports to provide a rigid structure for the compartments to be mounted to. The compartment openings shall be constructed of 3 inch high x 2 inch wide x .125 inch wall thickness cross members and shall be placed in between the external upright supports to define the openings of all enclosed body compartments again, providing a rigid mounting location for compartments.

## **COMPARTMENT FLOOR-SWEEP OUT STYLE**

Each compartment shall feature a raised floor sufficient enough so the lip of the compartment shall clear the frame rail of the body module to allow debris to be removed easily from the compartment. A hat shaped support shall be placed under the floor to improve stability and prevent bowing of the floor with use and age.

## **COMPARTMENTATION**

All compartments shall be constructed of smooth aluminum and welded for strength and shall be sealed from the elements. The compartments shall be attached to the aluminum superstructure only, in order to maintain a truly modular design. Each compartment shall include ventilation louvers which shall be provided on each side panel of the compartment to maximize moisture evacuation for the protection of the equipment and the compartment itself. Louvers shall be placed in the ventilation holes to prevent debris transfer to and from the inside of the body module. Each compartment shall feature a smooth edges and surfaces from the walls to each weld without burrs or sharp edges in the material.

## **DRIVER SIDE COMPARTMENT D1**

The driver's side forward compartment shall be located ahead of the rear wheels and shall include a "clear door opening" measurement of approximately 46" wide x 32" high. Compartment depth shall be determined by space available and shall measure approximately 25.5".

## **COMPARTMENT VENTILATION**

A minimum 2-inch single "Weber" style polished stainless steel swivel vent with four (4) 1/4-inch vent holes shall be provided. These vents shall have a stainless steel center bolt to lock the vent in either the open or closed position and be located in the compartment walls. All vents will contain fire resistant filters to minimize dust entering the compartment.

## **COMPARTMENT FLOOR DRAIN**

The compartment shall be provided with rear corner floor drains to the underside of the body.

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## **COMPARTMENT SILL PLATE**

The compartment shall feature a polished stainless steel sill plate protecting the painted surface of the compartment when items are accessed.

## **ADJUSTABLE UNISTRUT**

Adjustable Uni-Strut equipment mounting tracks shall be installed inside the compartment with two (2) channels on the left wall and two (2) channels on the right wall. The tracks shall be positioned to provide support for equipment mounting. The length of the tracks shall be sized to allow for optimum use of the compartment interior.

Adjustable Uni-Strut equipment mounting tracks shall be installed inside the compartment with one horizontally installed on the back wall near the top of the compartment.

## **ADJUSTABLE SHELF**

There shall be (1) adjustable shelf(ves) installed; and the shelf(ves) shall be constructed of .125" thick smooth aluminum plate and be mounted in the specified compartment with double bolt aluminum shelf brackets. The shelf(ves) shall have a broken front edge, and a broken rear edge for added strength and reinforcement.

## **COMPARTMENT SHELF GRATING**

The specified compartment shelf shall be fitted with removable interlocking vinyl Dri-Dek grating. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

The specified Dri-Dek grating shall be black in color.

The compartment shelf and or shelves shall have reflective striping added to the outside lip. The stripe shall be a 1-1/2" minimum in width.

Specified part shall include Red and White DOT approved reflective striping.

## **COMPARTMENT GRATING**

The compartments shall be fitted with removable interlocking vinyl Dri-Dek grating. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

## **COMPARTMENT GRATING EDGE**

The Dri-Dek grating shall be equipped with beveled edges where required.

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The specified Dri-Dek grating shall be black in color.

## **COMPARTMENT LIGHTING**

The specified compartment shall have two vertical Code 3 800 series lights installed.

## **DOOR AJAR SENSOR**

The Specified door(s) shall feature a magnetic proximity switch to indicate when the compartment door is ajar.

## **PASSENGER SIDE COMPARTMENT P1**

The passenger's side front lower compartment shall be located ahead of the rear wheels and shall include a "clear door opening" measurement of approximately 46" wide x 32" high. Compartment depth shall be determined by space available and shall measure approximately 25.5".

## **COMPARTMENT VENTILATION**

A minimum 2-inch single "Weber" style polished stainless steel swivel vent with four (4) ¼-inch vent holes shall be provided. These vents shall have a stainless steel center bolt to lock the vent in either the open or closed position and be located in the compartment walls. All vents will contain fire resistant filters to minimize dust entering the compartment.

## **COMPARTMENT FLOOR DRAIN**

The compartment shall be provided with rear corner floor drains to the underside of the body.

## **COMPARTMENT SILL PLATE**

The compartment shall feature a polished stainless steel sill plate protecting the painted surface of the compartment when items are accessed.

## **ADJUSTABLE UNISTRUT**

Adjustable Uni-Strut equipment mounting tracks shall be installed inside the compartment with two (2) channels on the left wall and two (2) channels on the right wall. The tracks shall be positioned to provide support for equipment mounting. The length of the tracks shall be sized to allow for optimum use of the compartment interior.

Adjustable Uni-Strut equipment mounting tracks shall be installed inside the compartment with one horizontally installed on the back wall near the top of the compartment.

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## **ADJUSTABLE SHELF**

There shall be (1) adjustable shelf(ves) installed; and the shelf(ves) shall be constructed of .125" thick smooth aluminum plate and be mounted in the specified compartment with double bolt aluminum shelf brackets. The shelf(ves) shall have a broken front edge, and a broken rear edge for added strength and reinforcement.

## **COMPARTMENT SHELF GRATING**

The specified compartment shelf shall be fitted with removable interlocking vinyl Dri-Dek grating. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

The specified Dri-Dek grating shall be black in color.

The compartment shelf and or shelves shall have reflective striping added to the outside lip. The stripe shall be a 1-1/2" minimum in width.

Specified part shall include Red and White DOT approved reflective striping.

## **COMPARTMENT GRATING**

The compartments shall be fitted with removable interlocking vinyl Dri-Dek grating. This material shall be resistant to heat, cold, ultra-violet radiation, mechanical impacts, chemical actions and is corrosion resistant.

## **COMPARTMENT GRATING EDGE**

The Dri-Dek grating shall be equipped with beveled edges where required.

The specified Dri-Dek grating shall be black in color.

## **COMPARTMENT LIGHTING**

The specified compartment shall have two vertical Code 3 800 series lights installed.

## **DOOR AJAR SENSOR**

The Specified door(s) shall feature a magnetic proximity switch to indicate when the compartment door is ajar.

## **WHEEL WELL PANEL CONSTRUCTION**

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The outer wheel well panel shall be an integral part of the overall body design and constructed of aluminum. It shall be welded in to place. The exterior wheel well area shall be painted to match the body.

## **WHEEL WELL LINERS**

Wheel well liners designed to protect the body from impact resulting from road debris thrown by the tires shall be installed. The removable liners shall be constructed from UHMW material to encompass the entire inner wheel well area. The liners shall be secured with threaded fasteners.

## **TANDEM REAR WHEEL FENDERETTES**

Rubber fenderettes shall be installed over the four (4) tandem rear wheel openings. The fenderettes shall be positioned outside of the wheel well panel to cover the tire area that extends past the body. The fenderettes shall be secured with threaded fasteners.

## **RUB RAILS, CLEARANCE LIGHTS, AND REFLECTIVE TAPE**

The sides of the lower body area fore and aft of the wheel well area shall be provided with 2" x 1.25" x .250" extruded aluminum rub rails, with end caps or angled corners.

Specified part shall include White reflective striping.

## **FRONT OF BODY -- PROTECTIVE SURFACE**

The front of the apparatus body shall include a protective surface, constructed of aluminum tread plate material, which shall cover the outboard portion of each side of the body.

## **FRONT CORNERS OF BODY -- PROTECTIVE SURFACES**

The front corners of the apparatus body shall include a protective surface installed. The surface shall be constructed of polished stainless steel material.

## **REAR BODY PANELS**

The entire rear of the apparatus body shall be painted apparatus color.

## **OUTER REAR BODY PANELS -- PROTECTIVE COVERING**

The rear outer panels of the body shall have protective surfaces installed on the corners. The protective covering shall be constructed of polished stainless steel material.

## **TOP OF BODY COMPARTMENTS -- PROTECTIVE SURFACES**

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The top of the side compartments shall have a protective surfaces installed. The surface shall be constructed of aluminum tread plate material.

## **ALUMININUM – COMPARTMENT DOOR, HINGED OVERLAP**

There shall be two (2) double, vertically hinged sets of doors fabricated from aluminum and installed on the apparatus body. Each door shall feature exterior surfaces which overlaps the opening of the compartment. The exterior surface shall be .125” aluminum for durability and damage resistance. The interior surface shall be .080” aluminum for structural support and overall appealing appearance of the compartment. The frame of the doors shall be constructed of 1.75” x 1.75” x .125” aluminum tubing to prevent corrosion and provide structural support. The spacing created by the frame tubing shall be filled with Styrofoam for added support and dent resistance, temperature insulation, and noise reduction.

A .75” lip shall be constructed around the opening of the compartment and the exterior of the door. A rubber seal shall be installed on the .75” lip of both the compartment and the door to provide for a double seal against water and dust. A rain gutter shall be mounted above the latch type door for an added third layer of water protection.

The doors shall be designed utilizing a D-ring latch system. A 6 inch stainless steel D-ring latch, large enough to accommodate a gloved hand, shall be mounted on the exterior of the door to allow the door to seal and fasten in the closed position. A stainless steel bezel shall be installed to house and protect the D-ring locking mechanism. The easily serviced bezel shall be mounted utilizing stainless steel screws for added stability of the mechanism and ease of maintenance in the event of damage. The D-ring locking mechanism shall be of a double catch design. The first catch shall engage to secure the door in the event of improper closure. The second catch will seal the door to water and other elements once the doors has been properly closed.

The doors shall be mounted with a stainless steel hinges with .25” diameter hinge pin for stability. The vertical hinges shall be mounted to the body frame with threaded inserts and stainless steel screws to preserve functionality with use or age and ease of maintenance in the event of damage.

Gas struts shall be utilized to hold the door in the open position and to prevent the door from slamming during closing. The gas struts are mounted directly to the door with a stainless steel bracket assembly for stability and ease of maintenance. The gas struts shall be mounted to the interior of the compartment with fully adjustable assembly for ease of adjustment and maintenance while increasing stability.

The specified door(s) shall have a Polished stainless-steel D-ring door handle.

The specified door(s) D-ring handles shall be equipped with manual key door locks keyed to use the 1250 key.

## **COMPARTMENT DOOR EDGE STRIPING**

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The hinged compartment doors shall have reflective striping applied on the edges. The stripe shall be a 1-1/2" minimum in width.

Specified part shall include Red and White DOT approved reflective striping.

## **REAR STEP**

The rear step shall have a frame work constructed of structural aluminum angles. There shall be channels on the exterior perimeter with center supports forming an independent assembly, and shall be bolted to the rear body structural framing to provide body protection and a solid rear stepping platform.

The walking surface of the rear step shall be aggressive DIAMOND BACK aluminum extrusions that complies to applicable NFPA standards.

## **FOLDING STEP -- DRIVERS SIDE FRONT**

There shall be one (1) Innovative Controls chrome plated zinc steps installed. The steps shall be a spring loaded design with an approx 8" by 6" stepping surface and feature a BME logo and an LED light to light up the stepping surface. The step shall be installed on the front drivers side of the body.

## **FOLDING STEP -- PASSENGER SIDE FRONT**

There shall be one (1) Innovative Controls chrome plated zinc steps installed. The steps shall be a spring loaded design with an approx 8" by 6" stepping surface and feature a BME logo and an LED light to light up the stepping surface. The step shall be installed on the front passenger side of the body.

## **HANDRAILS**

Two (2) knurled type non-slip handrail, approximately 36" in length, shall be vertically installed.

## **ROOF ACCESS LADDER**

A Ziamatic swing out and down ladder shall be installed on the drivers side of the rear body panel for access to the roof. The ladder shall be designed to store parallel to the body when not in use. A handle shall be provided to unlock the ladder from the travel position to allow the ladder to be pulled out to a comfortable climbing angle.

Release of the handle allows the ladder to latch automatically and it will not retract until the scissor lock is raised. The ladder shall have a two-rung fold-down section and a six-rung main ladder section and be equipped with cast aluminum rungs having flat, non-skid surfaces to provide traction and safety.

## **LADDER LIGHTING**

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There shall be two (2) Whelen 0S series part# 0AC0EDCR 45 degree angled light(s) installed to adequately illuminate the rear ladder.

## **HOSE BODY CONSTRUCTION SPECIFICATIONS**

The hose bed side sheets and floor shall be constructed from aluminum material. The hose body shall be free of sharp corners, bolts, or other obstructions that may catch hose and other equipment.

## **HOSE BED DIVIDER**

One (1) adjustable width hose bed divider constructed from no less than .250 (1/4") aluminum material shall be installed. The divider shall be secured to the hose bed by utilizing adjustable track type channels and fasteners. The divider shall be full length and depth of the hose bed.

## **ALUMINUM HOSEBED GRATING**

The hose bed compartment deck shall be constructed entirely from maintenance-free, extruded aluminum slats. The slats shall have an anodized, contoured ribbed top surface. The slats shall be of widths approximately 3/4" high x 7.5" wide and shall be riveted into a one-piece grid system to prevent the accumulation of water and allow ventilation to assist in drying hose.

## **HYPALON HOSEBED COVER**

The apparatus shall be equipped with a Hypalon hose bed cover with a positive secured compliant rear flap.

The hosebed cover shall be black in color.

## **WATER TANK SPECIFICATIONS**

The water tank shall have a capacity of 3000 gallons.

## **WATER TANK WARRANTY**

The polypropylene water tank that is specified to be supplied with this apparatus shall be warranted by the water tank manufacturer for a "lifetime" period from the date that the apparatus is put into service. The tank manufacturer shall repair, at no cost to the purchaser, any problems caused by defective materials and/or workmanship. The warranty shall cover the reasonable costs of removing the water tank from the apparatus and reinstalling it after the completion of the covered warranty repairs, but shall not cover any liability for the loss of service or downtime costs of the apparatus.

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## **NFPA COMPLIANCE**

The water tank construction shall conform to applicable NFPA standards.

## **TANK FILL PROVISIONS**

A 10" square x 10" high fill tower shall be equipped with a hinged, watertight cover and a removable screen to catch debris. A color-coded label or visible permanent marking that reads "WATER TANK FILL" shall be placed at or near the water tank fill opening. The fill tower shall be centrally located at the front area of the tank.

## **SQUARE DUMP FLANGE**

There shall be a 10" square quick dump flange incorporated in the tank design. It shall be located at the rear of the tank; centered at the bottom.

## **DIRECT TANK FILL FLANGE**

There shall be a 4" direct tank fill flange, with diffuser incorporated in the tank design.

## **TANK SUMP**

A 12" square x 4" deep sump shall be installed in the bottom of the water tank. The water tank sump shall be equipped with anti-swirl device.

## **WATER TANK DRAIN PROVISIONS**

A 3" plugged drain provision shall be installed in the bottom of the water tank, sump, or plumbing for water tank draining and the flushing-out of debris.

## **WATER TANK SLEEVE**

A 6" outside diameter sleeve shall be incorporated into the fabrication of the water tank. The horizontal sleeve shall allow 5" piping to pass through the tank.

## **CLASS A FOAM TANK SPECIFICATIONS**

The Class A foam tank shall have a capacity of 20 gallons.

## **FOAM TANK WARRANTY**

The foam tank shall carry a "lifetime" warranty against defects in workmanship and perforation corrosion. The provisions of this warranty shall be provided in the delivery documentation. The tank manufacturer shall repair,

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at no cost to the purchaser, any problems caused by defective materials and/or workmanship. The warranty shall cover the reasonable costs of removing the water tank from the apparatus and reinstalling it after the completion of the covered warranty repairs, but shall not cover any liability for the loss of service or downtime costs of the apparatus.

## **FOAM TANK FILL AND VENTING PROVISIONS**

The foam concentrate tank shall be provided with a fill pipe having a volume of not less than 2 percent of the total tank volume. The filler opening shall be capped with a sealed air-tight threaded cover. The fill opening shall be designed to incorporate a removable screen and shall be located so that foam concentrate from a five (5) gallon container can be dumped into the tank.

The foam tank filler shall be equipped with a pressure/vacuum vent that enables the tank to compensate for changes in pressure or vacuum when filling or withdrawing foam concentrate from the tank. The pressure/vacuum vent shall not allow atmospheric air to enter the foam tank except during operation or to compensate for thermal fluctuations. The vent shall be protected to prevent foam concentrate from escaping or directly contacting the vent at any time. The vent shall be of sufficient size to prevent tank damage during filling or foam withdrawal.

A color coded label or visible permanent marking that reads "CLASS A -- FOAM TANK FILL" shall be placed at or near the foam concentrate tank fill opening. An additional label shall be placed at or near any foam concentrate tank fill opening stating the type of foam concentrate the system is designed to use.

Any restrictions on the types of foam concentrate that can be used with the system shall also be stated, along with a warning message that states "WARNING: DO NOT MIX BRANDS AND TYPES OF FOAM."

A 3/4" diameter connection, piping, and gate type valve shall be installed for the foam tank for draining purposes.

## **CENTER REAR 180 DEGREE QUICK DUMP VALVE**

A Newton Kwik-Dump 10" 180 degree swivel dump chute shall be supplied. The dump chute shall be centrally located at the rear of the vehicle at a height that allows for proper operation.

All components exposed to the contents of the tank shall be constructed from stainless steel or other non-corrosive materials.

A Newton quick dump model #4036-34 36" stainless steel quick dump chute extension shall be installed on quick dump.

## **Quick Dump Valve**

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A manual style flip type stainless steel quick dump valve shall be installed on the quick dump.

## **TANK FILL VALVE**

(1) Firemen's Friend check valve for direct filling of the tank shall be installed. The valve shall be configured with 4" NST female threads, intake screen, threaded plug with retention chain. The valve shall be located on the drivers side rear of the body.

## **12 VOLT ELECTRICAL SPECIFICATIONS**

The following describes the low voltage electrical system on the apparatus including all panels, electrical components, switches and relays, wiring harnesses, and other electrical components. The apparatus manufacturer shall conform to the latest Federal DOT standards, current automotive electrical system standards, and the applicable requirements of the current NFPA standards.

Wiring shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 percent of the maximum current for which the circuit is protected. Voltage drops shall not exceed 10 percent in all wiring from the power source to the user device. The wiring and wiring harness and insulation shall be in conformance to applicable SAE and NFPA standards. The wiring harness shall conform to SAE J-1128 with GXL temperature properties. Exposed wiring shall be run in a loom with a 290 degree Fahrenheit rating. Wiring looms shall be properly supported and attached to body members. Electrical conductors shall be constructed in accordance with applicable SAE standards, except when good engineering practice requires special construction.

All wiring connections and terminations shall provide positive mechanical and electrical connections and be installed in accordance with the device manufacturer's instructions. When wiring passes through metal panels, electrical connections shall be with mechanical type fasteners and rubber/plastic grommets.

Wiring between cab and body shall be split using Deutsch type connectors or enclosed in a terminal junction panel allowing body removal with minimal impact on the apparatus electrical system. Connections shall be insulated with heat shrink crimp-type tubing to resist moisture and foreign debris such as grease and road grime. Weather-resistant connectors shall be provided throughout the system.

Electrical junction or terminal boxes shall be weather resistant and located away from water spray conditions. When required, automatic reset breakers and relays shall be housed in the main body junction panel.

There shall be no exposed electrical cabling, harnesses, or terminal connections located in compartments, unless enclosed in an electrical junction box or covered with a removable electrical panel. Wiring shall be secured in place and protected against heat, liquid contaminants, damage, and shall be uniquely identified at least every six inches (6") by color-coding or permanent marking with a circuit function code and identified on a reference chart or electrical wiring schematic per requirements of applicable NFPA standards.

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Low voltage protective devices shall be provided for the electrical circuits. The devices shall be accessible and located in required terminal connection locations or weather-resistant enclosures. Overcurrent protection devices shall be automatic reset types suitable for electrical equipment and meet SAE standards. All electrical equipment, switches, relays, terminals, and connectors shall have a direct current rating of 125 percent of the maximum current for which the circuit is protected. Electro-magnetic interference suppression shall be provided in the system as required in applicable SAE standards.

The electrical system shall include the following:

Electrical terminals in weather-exposed areas shall have a non-conductive grease or spray applied. All terminal plugs located outside of the cab or body shall be treated with a corrosion preventative compound.

All electrical wiring shall be placed in a protective loom or be harnessed.

Exposed connections shall be protected by heat shrink material and sealed connectors.

Large fender washers shall be used when fastening equipment to the underside of the cab roof and all holes made in the roof shall be caulked with silicone.

Electrical components installed in exposed areas shall be mounted in a manner that will not allow moisture to accumulate inside.

A service loop shall be provided behind an electrical appliance to allow them to be pulled away from the mounting area for inspection and service work.

Upon completion of the vehicle and prior to delivery, the apparatus shall be electrically tested and the electrical testing, certifications, and test results shall be submitted with delivery documentation per requirements of the applicable NFPA standard.

## **ELECTRICAL WIRING HARNESS**

The electrical system shall be divided into separate harnesses. The individual harness shall be connected to the electrical box with Deutsch type quick connectors. The wiring and appliances shall be protected by automatic reset type circuit breakers.

## **CUSTOM FABRICATED CONSOLE**

A custom fabricated electrical console and enclosure shall be located between the driver's and the officer's seating positions. The console shall feature a flat lid with two rows of havis style plates side by side.

## **CONSOLE MAP BOX**

There shall be a map box attached to the rear of the console. The map box shall be painted to match the console.

The specified compartment(s) shall be coated with Black/Black colored Multi-Spec paint.

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## **BATTERY SWITCH - MASTER DISCONNECT**

A battery cutoff switch shall be provided in the cab within easy reach of the driver; by the chassis manufacturer. There shall be a 200amp continuous rated solenoid installed and switched by the OEM battery master switch.

## **BATTERY CHARGER**

A Kussmaul Autocharge 1000 PLC, model #091-215-12, automatic battery charger shall be provided. The battery charger shall be wired to the 12 volt battery system. The unit shall be mounted in a clean, dry area accessible for service and/or maintenance. It shall be wired to the specified shore power receptacle. Included in the package is a Kussmaul Super 15 Auto Eject Deluxe with built in bar graph display.

## **ENGINE BLOCK HEATER WIRING**

A 120 volt engine block heater shall be installed by chassis manufacturer and shall be wired to the specified shore power receptacle.

The specified auto eject cover shall be grey.

## **IDENTIFICATION LIGHTS**

All LED identification lights shall be installed on the vehicle as required by applicable highway regulations.

## **LICENSE PLATE MOUNTING AND LIGHT**

A predrilled backing plate and LED light shall be installed on the rear for mounting of the license plate.

Stop, Tail, Turn Lights, Tomar, 4" x "6, Triple, Package

## **STOP AND TAIL LIGHT**

Two (2) Tomar Model # R46L-STT 4" x 6" LED stop and tail lights with clear lenses shall be provided. The light can be used in combination with a separated turn signal, or alone as a Brake, tail, and turn light.

## **TURN SIGNALS**

Two (2) Tomar model# R46L-TURN 4" x 6" LED turn signal lights with clear lenses shall be provided.

## **TAILLIGHT BEZELS**

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Two (2) Tomar Chrome plastic housings Model #R46-BZ3 shall be installed at the rear of the apparatus for Three (3) Tomar 4" x 6" stop-tail-turn-backup and warning lights.

## **ZONE C- LOWER REAR WARNING LIGHT - DRIVER SIDE**

(1) Tomar Revolution multi-function Model # R46D-W-BAW LED light shall be installed. The dimensions of the light shall be 4" x 6". The light shall be equipped with a clear lens, and emit blue, white and amber light.

Light shall be installed on the driver's side.

## **ZONE C- LOWER REAR WARNING LIGHT - PASSENGER SIDE**

(1) Tomar Revolution multi-function Model # R46D-W-RAW LED light shall be installed. The dimensions of the light shall be 4" x 6". The light shall be equipped with a clear lens, and emit red, white and amber light.

## **FRONT BUMPER -- GROUND LIGHTS**

There shall be two (2) Tecniq E10, LED ground light(s) installed under the front bumper.

The ground lights shall be activated when parking brake is set, or the transmission is placed into park (where applicable).

## **CAB DOOR -- GROUND LIGHTS**

There shall be two (2) Tecniq E10, LED ground lights installed under the cab door(s).

The ground lights shall be activated when parking brake is set, or the transmission is placed into park (where applicable).

## **GROUND LIGHTS - PUMP PANEL**

There shall be two (2) Tecniq E10, LED ground lights installed under the pump panel running board(s).

The ground lights shall be activated when parking brake is set, or the transmission is placed into park (where applicable).

## **GROUND LIGHTS - FRONT BODY**

There shall be two (2) Tecniq E10, LED ground lights installed under the front body compartment(s).

The ground lights shall be activated when parking brake is set, or the transmission is placed into park (where applicable).

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## **GROUND LIGHTS - UNDER REAR SIDE COMPARTMENT**

There shall be two (2) Tecniq E10, LED ground lights installed under the rear side body compartment(s).

The ground lights shall be activated when parking brake is set, or the transmission is placed into park (where applicable).

## **GROUND LIGHTS - UNDER REAR STEP**

There shall be two (2) Tecniq E10, LED ground lights installed under the rear step area.

The ground lights shall be activated when parking brake is set, or the transmission is placed into park (where applicable).

## **LADDER LIGHTING**

There shall be two (2) Whelen 0S series part# 0AC0EDCR 45 degree angled light(s) installed to adequately illuminate the rear ladder.

## **SCENE LIGHTS**

Two (2) Tomar Revolution Model# R79L-13 7" by 9", clear LED flood scene light(s) shall be installed. The light(s) shall feature a 13 degree down angle lens. The light(s) shall include a rubber gasket for surface mounting.

The specified Tomar 7" x 9" light(s) shall be equipped with a Tomar bezel Chrome in color. Model # R79-BZ

## **DOOR OPEN WARNING LIGHT**

A door open warning light shall be installed on cab dash. The light shall be a flashing LED light with a red lens. The light shall include a label, "Do Not Move Apparatus When Light is ON".

## **"DOOR OPEN" AND EQUIPMENT OPERATION ALARM**

A buzzer or alarm shall be installed in cab to indicate "doors open" or equipment operation on the apparatus. The buzzer shall operate when parking brake is released.

## **RADIO ANTENNA INSTALLATION**

There shall be one (1) radio antenna installed on the apparatus and routed to the cab center console.

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## **BACK UP ALARM**

One (1) solid state back up alarm shall be provided at the rear of the apparatus. The back up alarm shall be wired to the reverse circuit of the transmission, and shall provide an audible alarm to the rear of the apparatus when reverse gear is selected. The alarm shall have a volume of 87 to 112 db while in operation.

## **BACK UP CAMERA**

There shall be a Rear View Safety back up camera system supplied and installed on the apparatus.

## **HEADLIGHT FLASHER**

The headlights shall be set to alternate flash (Wig-Wag).

The wig wag shall be triggered by the siren controller slide switch position 3.

## **ELECTRONIC SIREN**

Tomar Model 948 Siren amp and electronic controller, shall be provided. The siren controller shall have a 4 position slide switch, along with 6 auxiliary switches to control outputs, also to contain siren controls. Model # 948L-SIREN-R.

## **SIREN SPEAKER**

One (1) Tomar Model # SPK100 speaker shall be provided.

## **ZONE A -- UPPER FRONT -- LIGHTBAR**

One (1) Tomar Scorpion 58" lightbar Model# 970L-58DT-BR Shall be installed. The lightbar shall contain full dual color front and sides (red/blue/wht). Lightbar shall include CA flash rates and CA steady red. The front of the lightbar shall be fully populated with eight (8) 12-LED modules, High-power off-road TRX take downs, and four (4) 24-LED corner modules with alley lights. The light bar shall be aluminum in color.

## **ZONE A -- LOWER FRONT WARNING LIGHTS**

(1) Tomar revolution dual color Model# R37D-W-RW LED light shall be installed. The dimensions of the light shall be 3" x 7". The light shall be equipped with a clear lens, and red and white LED.

The light shall be installed on the driver's side of the grill.

The specified Tomar 3" x 7" light(s) shall be equipped with a Tomar bezel Chrome in color. Model # R37-BZ

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## **ZONE A -- LOWER FRONT WARNING LIGHTS**

(1) Tomar revolution dual color Model# R37D-W-BW LED light shall be installed. The dimensions of the light shall be 3" x 7". The light shall be equipped with a clear lens, and blue and white LED.

The light shall be installed on the passenger's side of the grill.

The specified Tomar 3" x 7" light(s) shall be equipped with a Tomar bezel Chrome in color. Model # R37-BZ

## **ZONE B AND D- INTERSECTION LIGHTS**

Two (2) Tomar revolution dual color Model# R37D-W-RW LED lights shall be installed. The dimensions of the lights shall be 3" x 7". The lights shall be equipped with a Clear lens, and Red and White LED.

The specified Tomar 3" x 7" light(s) shall be equipped with a Tomar bezel Chrome in color. Model # R37-BZ

## **ZONE B AND D LOWER MID BODY WARNING LIGHTS**

Two (2) Tomar revolution dual color Model# R37D-W-BW LED lights shall be installed. The dimensions of the lights shall be 3" x 7". The lights shall be equipped with a Clear lens, and Blue and White LED.

The specified Tomar 3" x 7" light(s) shall be equipped with a Tomar bezel Chrome in color. Model # R37-BZ

## **ZONE B AND D LOWER REAR CORNER WARNING LIGHTS**

Two (2) Tomar revolution dual color Model# R37D-W-BW LED lights shall be installed. The dimensions of the lights shall be 3" x 7". The lights shall be equipped with a Clear lens, and Blue and White LED.

The specified Tomar 3" x 7" light(s) shall be equipped with a Tomar bezel Chrome in color. Model # R37-BZ

## **ZONE B AND D- UPPER SIDE FRONT WARNING LIGHTS**

Two (2) Tomar revolution dual color Model# R37D-W-RW LED lights shall be installed. The dimensions of the lights shall be 3" x 7". The lights shall be equipped with a Clear lens, and Red and White LED.

The specified Tomar 3" x 7" light(s) shall be equipped with a Tomar bezel Chrome in color. Model # R37-BZ

## **ZONE B AND D- UPPER SIDE REAR WARNING LIGHTS**

Two (2) Tomar revolution dual color Model# R79LV13-RW series LED lights shall be installed. The dimensions of the lights shall be 7" x 9". The lights shall be equipped with a Clear lens, and red and white LED.

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The specified Tomar 7" x 9" light(s) shall be equipped with a Tomar bezel Chrome in color. Model # R79-BZ

## **ZONE C- UPPER REAR WARNING LIGHT - DRIVER SIDE**

(1) Tomar revolution dual color Model# R79LVD13-RAW series LED light shall be installed. The dimensions of the light shall be 7" x 9". The light shall be equipped with a clear lens and red, amber, and white LED.

The light shall be installed on the driver's side.

The specified Tomar 7" x 9" light(s) shall be equipped with a Tomar bezel Chrome in color. Model # R79-BZ

## **ZONE C- UPPER REAR WARNING LIGHT - PASSENGER SIDE**

(1) Tomar revolution dual color Model# R79LVD13-BAW series LED light shall be installed. The dimensions of the light shall be 7" x 9". The light shall be equipped with a clear lens and blue, amber, and white LED.

The light shall be installed on the passenger's side.

The specified Tomar 7" x 9" light(s) shall be equipped with a Tomar bezel Chrome in color. Model # R79-BZ

## **REAR TRAFFIC ADVISOR, EIGHT (8) LAMPS**

A Tomar L stick traffic advisor model # LSTICK-14TD8-B LED shall be provided and mounted at the rear of the body. The traffic advisor shall include a 40' cable.

## **PAINT CODES/COLORS**

The apparatus shall be painted the following color(s): Pierce 117 Red lower with Pierce 20 White upper.

## **BODY PAINTING SPECIFICATIONS**

All exposed surfaces shall be prepared and painted using a multi-step process to ensure a blemish-free, protective coating for the base metal materials.

All removable items, such as brackets and compartment doors, shall be removed and painted separately to insure finish paint behind them after they are reinstalled.

Due to its modular design, the apparatus body shall be completely finish painted prior to its installation on the chassis.

The body shall be sanded, and cleaned. Any imperfections or defects in the metal shall be corrected with

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premium body filler and then sanded smooth.

An epoxy primer shall be utilized on all painted and coated surfaces and shall prepare the metal for the final paint. The direct-to-metal primer shall be used to create a first level seal allowing secure adhesion between the base metal and the subsequent substrates.

All body and components shall then be primed, thoroughly sanded, and meticulously inspected for any imperfections; which shall be properly corrected..

All surfaces shall then be painted with a base coat of premium paint following the guidelines as established by the paint manufacturer. The body shall be painted using a single color to match the cab primary color, and then shall be buffed to a high gloss finish.

## **INTERIOR COMPARTMENT FINISH**

The interior wall, floor and ceiling surfaces of compartments shall be finished with Rust-Oleum brand Multispec color flecked paint.

The specified compartment(s) shall be coated with Gray Stone colored Multi-Spec paint.

## **TOUCH-UP PAINT**

Touch-up paint (one for each color) shall be furnished with the completed truck at final delivery.

## **STRIPING PACKAGE- SINGLE 4" STRIPE**

There shall be a single 4" reflective stripe installed one on each side of the apparatus. The stripe is limited to single color only.

## **CHEVRON STRIPING**

The rear panels of the body shall have 3M brand, 6" wide, reflective striping installed in the available area. The Chevron style stripes shall be applied at a 45-degree angle, pointing towards the center upper portion of the rear panel. The Chevron striping shall cover the entire rear of the apparatus.

## **CHEVRON COLORS**

The specified chevron colors shall be red and yellow.

## **SUCTION HOSE**

There shall be **NO** suction hose supplied on the apparatus.

# BME Fire Trucks, LLC

## **HARD SUCTION MOUNTINGS -- LEFT SIDE**

There shall be one (1) horizontally mounted .188" aluminum hard suction hose tray(s) installed. The tray(s) shall be equipped with spring loaded hose clamps. Location shall be: left side.

## **PORTABLE WATER TANK MOUNTING -- RIGHT SIDE**

One (1) Zico 12 volt electric folding tank mounting shall be installed on the right side of the apparatus. The Quic-Lift assembly shall be comprised of a high strength aluminum casting with a 12 volt electric lift system for raising and lowering the folding tank. The storage system shall be powered by a 12 volt self-contained electric power unit. The Quic-Lift system shall be mounted in an upright position above the compartments.

The lift control shall be a momentary switch, properly labeled. The mounting shall be equipped with reflective stripping and red flashing marker lights, front and rear, which activate when the rack is moved out of the locked position. A warning light shall be provided in the cab. The light shall flash whenever the rack is out of the stored position. An alarm system shall be provided when in operation which shall be interlocked with the neutral safety and parking brake switch. The storage system shall be built to meet NFPA standards.

## **FOLDING TANK COVER (ALUMINUM DIAMOND PLATE)**

The folding tank shall have an aluminum diamond plate cover.

## **WHEEL CHOCKS**

Two (2) Zico brand, Model#AC-2 aluminum wheel chock blocks, with mounting brackets, shall be provided and installed on the apparatus body. The mounting locations for the chock blocks shall be one (1) each side of the apparatus body.

## **5# DRY CHEMICAL FIRE EXTINGUISHER**

One (1) 5# ABC dry chemical fire extinguisher and mounting bracket shall be provided on the apparatus. The extinguisher shall have a pressure gauge and shall be filled with a dry chemical extinguishing agent.

## **HYDRAULIC JACK**

One (1) hydraulic jack shall be provided. The jack shall be designed for lifting capacity of twelve (12) tons.

## **LUG WRENCH**

There shall be one (1) lug wrench provided and shipped loose with the completed apparatus.

Mark Wilson

# BME Fire Trucks, LLC

## **REFLECTOR**

A set of three (3) triangular reflectors shall be provided.

# H-GAC

Houston-Galveston Area Council  
P.O. Box 22777 · 3555 Timmons · Houston, Texas 77227-2777

Cooperative Agreement - Contract - Hughes Fire Equipment, Inc. - Public Services - ID: 11604 - - FS12-23

## MASTER GENERAL PROVISIONS

This Master Agreement is made and entered into, by and between the Houston-Galveston Area Council hereinafter referred to as H-GAC having its principal place of business at 3555 Timmons Lane, Suite 120, Houston, Texas 77027 and Hughes Fire Equipment, Inc., hereinafter referred to as the Contractor, having its principal place of business at 910 Shelley Street, Springfield, OR 97477.

WITNESSETH:

WHEREAS, H-GAC hereby engages the Contractor to perform certain services in accordance with the specifications of the Master Agreement; and

WHEREAS, the Contractor has agreed to perform such services in accordance with the specifications of the Master Agreement;

NOW, THEREFORE, H-GAC and the Contractor do hereby agree as follows:

### **ARTICLE 1: LEGAL AUTHORITY**

The Contractor warrants and assures H-GAC that it possesses adequate legal authority to enter into this Master Agreement. The Contractor's governing body, where applicable, has authorized the signatory official(s) to enter into this Master Agreement and bind the Contractor to the terms of this Master Agreement and any subsequent amendments hereto.

### **ARTICLE 2: APPLICABLE LAWS**

The Contractor agrees to conduct all activities under this Master Agreement in accordance with all federal laws, executive orders, policies, procedures, applicable rules, regulations, directives, standards, ordinances, and laws, in effect or promulgated during the term of this Master Agreement, including without limitation, workers' compensation laws, minimum and maximum salary and wage statutes and regulations, and licensing laws and regulations. When required, the Contractor shall furnish H-GAC with satisfactory proof of its compliance therewith.

### **ARTICLE 3: PUBLIC INFORMATION**

Except as stated below, all materials submitted to H-GAC, including any attachments, appendices, or other information submitted as a part of a submission or Master Agreement, are considered public information, and become the property of H-GAC upon submission and may be reprinted, published, or distributed in any manner by H-GAC according to open records laws, requirements of the US Department of Labor and the State of Texas, and H-GAC policies and procedures. In the event the Contractor wishes to claim portions of the response are not subject to the Texas Public Information Act, it shall so; however, the determination of the Texas Attorney General as to whether such information must be disclosed upon a public request shall be binding on the Contractor. H-GAC will request such a determination only if Contractor bears all costs for preparation of the submission. H-GAC is not responsible for the return of creative examples of work submitted. H-GAC will not be held accountable if material from submissions is obtained without the written consent of the contractor by parties other than H-GAC, at any time during the evaluation process.

### **ARTICLE 4: INDEPENDENT CONTRACTOR**

The execution of this Master Agreement and the rendering of services prescribed by this Master Agreement do not change the independent status of H-GAC or the Contractor. No provision of this Master Agreement or act of H-GAC in performance of the Master Agreement shall be construed as making the Contractor the agent, servant, or employee of H-GAC, the State of Texas, or the United States Government. Employees of the Contractor are

subject to the exclusive control and supervision of the Contractor. The Contractor is solely responsible for employee related disputes and discrepancies, including employee payrolls and any claims arising therefrom.

**ARTICLE 5: ANTI-COMPETITIVE BEHAVIOR**

Contractor will not collude, in any manner, or engage in any practice which may restrict or eliminate competition or otherwise restrain trade.

**ARTICLE 6: SUSPENSION AND DEBARMENT**

Debarment and Suspension (Executive Orders 12549 and 12689) – A contract award (2 CFR 180.220) must not be made to parties listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR Part 1966 Comp. p. 189) and 12689 (3 CFR Part 1989 Comp. p. 235), “Debarment and Suspension.” SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

Pursuant to the Federal Rule above, Respondent certifies that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation by any federal department or agency or by the State of Texas and at all times during the term of the Contract neither it nor its principals will be debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation by any federal department or agency or by the State of Texas Respondent shall immediately provide the written notice to H-GAC if at any time the Respondent learns that this certification was erroneous when submitted or has become erroneous by reason of changed circumstances. H-GAC may rely upon a certification of the Respondent that the Respondent is not debarred, suspended, ineligible, or voluntarily excluded from the covered contract, unless the H-GAC knows the certification is erroneous.

**ARTICLE 7: GOAL FOR CONTRACTING WITH SMALL AND MINORITY BUSINESSES, WOMEN’S BUSINESS ENTERPRISES, AND LABOR SURPLUS AREA FIRMS (if subcontracts are to be let)**

H-GAC’s goal is to assure that small and minority businesses, women's business enterprises, and labor surplus area firms are used when possible in providing services under a contract. In accordance with federal procurements requirements of 2 CFR §200.321, if subcontracts are to be let, the prime contractor must take the affirmative steps listed below:

1. Placing qualified small and minority businesses and women’s business enterprises on solicitation lists;
2. Assuring that small and minority businesses and women’s business enterprises are solicited whenever they are potential sources;
3. Dividing total requirements, when economically feasible, into smaller task or quantities to permit maximum participation by small and minority businesses, and women’s business enterprises;
4. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women’s business enterprises;
5. Using the services and assistance as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.
- 6.

Nothing in this provision will be construed to require the utilization of any firm that is either unqualified or unavailable. The Small Business Administration (SBA) is the primary reference and database for information on requirements related to Federal Subcontracting <https://www.sba.gov/federal-contracting/contracting-guide/prime-subcontracting>

NOTE: The term DBE as used in this solicitation is understood to encompass all programs/business enterprises such as: Small Disadvantaged Business (SDB), Historically Underutilized Business (HUB), Minority Owned Business Enterprise (MBE), Women Owned Business Enterprise (WBE) and Disabled Veteran Business Enterprise (DVBE) or other designation as issued by a certifying agency.

**Contractor agrees to work with and assist HGACBuy customer in meeting any DBE targets and goals, as may be required by any rules, processes, or programs they might have in place. Assistance may include compliance with reporting requirements, provision of documentation, consideration of Certified/Listed subcontractors, provision of documented evidence that an active participatory role for a DBE entity was**

**considered in a procurement transaction, etc.**

**ARTICLE 8: SCOPE OF SERVICES**

The services to be performed by the Contractor are outlined in an Attachment to this Master Agreement.

**ARTICLE 9: PERFORMANCE PERIOD**

This Master Agreement shall be performed during the period which begins Dec 01 2023 and ends Nov 30 2027. All services under this Master Agreement must be rendered within this performance period, unless directly specified under a written change or extension provisioned under Article 21, which shall be fully executed by both parties to this Master Agreement.

**ARTICLE 10: PAYMENT OR FUNDING**

Payment provisions under this Master Agreement are outlined in the Special Provisions. H-GAC will not pay for any expenses incurred prior to the execution date of a contract, or any expenses incurred after the termination date of the contract.

**ARTICLE 11: PAYMENT FOR WORK**

The H-GAC Customer is responsible for making payment to the Contractor upon delivery and acceptance of the goods or completion of the services and submission of the subsequent invoice.

**ARTICLE 12: PAYMENT TERMS/PRE-PAYMENT/QUANTITY DISCOUNTS**

If discounts for accelerated payment, pre-payment, progress payment, or quantity discounts are offered, they must be clearly indicated in the Contractor's submission prior to contract award. The applicability or acceptance of these terms is at the discretion of the Customer.

**ARTICLE 13: REPORTING REQUIREMENTS**

If the Contractor fails to submit to H-GAC in a timely and satisfactory manner any report required by this Master Agreement, or otherwise fails to satisfactorily render performances hereunder, H-GAC may terminate this Master Agreement with notice as identified in Article 29 of these General Provisions. H-GAC has final determination of the adequacy of performance and reporting by Contractor. Termination of this Master Agreement for failure to perform may affect Contractor's ability to participate in future opportunities with H-GAC. The Contractor's failure to timely submit any report may also be considered cause for termination of this Master Agreement. Any additional reporting requirements shall be set forth in the Special Provisions of this Master Agreement.

**ARTICLE 14: INSURANCE**

Contractor shall maintain insurance coverage for work performed or services rendered under this Master Agreement as outlined and defined in the attached Special Provisions.

**ARTICLE 15: SUBCONTRACTS AND ASSIGNMENTS**

Except as may be set forth in the Special Provisions, the Contractor agrees not to assign, transfer, convey, sublet, or otherwise dispose of this Master Agreement or any right, title, obligation, or interest it may have therein to any third party without prior written approval of H-GAC. The Contractor acknowledges that H-GAC is not liable to any subcontractor or assignee of the Contractor. The Contractor shall ensure that the performance rendered under all subcontracts shall result in compliance with all the terms and provisions of this Master Agreement as if the performance rendered was rendered by the Contractor. Contractor shall give all required notices, and comply with all laws and regulations applicable to furnishing and performance of the work. Except where otherwise expressly required by applicable law or regulation, H-GAC shall not be responsible for monitoring Contractor's compliance, or that of Contractor's subcontractors, with any laws or regulations.

**ARTICLE 16: AUDIT**

Notwithstanding any other audit requirement, H-GAC reserves the right to conduct or cause to be conducted an independent audit of any transaction under this Master Agreement, such audit may be performed by the H-GAC local government audit staff, a certified public accountant firm, or other auditors designated by H-GAC and will be

conducted in accordance with applicable professional standards and practices. The Contractor understands and agrees that the Contractor shall be liable to the H-GAC for any findings that result in monetary obligations to H-GAC.

**ARTICLE 17: TAX EXEMPT STATUS**

H-GAC and Customer members are either units of government or qualified non-profit agencies, and are generally exempt from Federal and State sales, excise or use taxes. Respondent must not include taxes in its Response. It is the responsibility of Contractor to determine the applicability of any taxes to an order and act accordingly. Exemption certificates will be provided upon request.

**ARTICLE 18: EXAMINATION OF RECORDS**

The Contractor shall maintain during the course of the work complete and accurate records of all of the Contractor's costs and documentation of items which are chargeable to H-GAC under this Master Agreement. H-GAC, through its staff or designated public accounting firm, the State of Texas, and United States Government, shall have the right at any reasonable time to inspect, copy and audit those records on or off the premises by authorized representatives of its own or any public accounting firm selected by H-GAC. The right of access to records is not limited to the required retention period, but shall last as long as the records are retained. Failure to provide access to records may be cause for termination of the Master Agreement. The records to be thus maintained and retained by the Contractor shall include (without limitation): (1) personnel and payroll records, including social security numbers and labor classifications, accounting for total time distribution of the Contractor's employees working full or part time on the work, as well as cancelled payroll checks, signed receipts for payroll payments in cash, or other evidence of disbursement of payroll payments; (2) invoices for purchases, receiving and issuing documents, and all other unit inventory records for the Contractor's stocks or capital items; and (3) paid invoices and cancelled checks for materials purchased and for subcontractors' and any other third parties' charges.

Contractor agrees that H-GAC will have the right, with reasonable notice, to inspect its records pertaining to purchase orders processed and the accuracy of the fees payable to H-GAC. The Contractor further agrees that the examination of records outlined in this article shall be included in all subcontractor or third-party Master Agreements.

**ARTICLE 19: RETENTION OF RECORDS**

The Contractor and its subcontractors shall maintain all records pertinent to this Master Agreement, and all other financial, statistical, property, participant records, and supporting documentation for a period of no less than seven (7) years from the later of the date of acceptance of the final payment or until all audit findings have been resolved. If any litigation, claim, negotiation, audit or other action involving the records has been started before the expiration of the retention period, the records shall be retained until completion of the action and resolution of all issues which arise from it, or until the end of the seven (7) years, whichever is later, and until any outstanding litigation, audit, or claim has been fully resolved.

**ARTICLE 20: DISTRIBUTORS, VENDORS, RESELLERS**

Contractor agrees and acknowledges that any such designations of distributors, vendors, resellers or the like are for the convenience of the Contractor only and the awarded Contractor will remain responsible and liable for all obligations under the Contract and the performance of any designated distributor, vendor, reseller, etc. Contractor is also responsible for receiving and processing any Customer purchase order in accordance with the Contract and forwarding of the Purchase Order to the designated distributor, vendor, reseller, etc. to complete the sale or service. H-GAC reserves the right to reject any entity acting on the Contractor's behalf or refuse to add entities after a contract is awarded.

**ARTICLE 21: CHANGE ORDERS AND AMENDMENTS**

- A. Any alterations, additions, or deletions to the terms of this Master Agreement, which are required by changes in federal or state law or by regulations, are automatically incorporated without written amendment hereto, and shall become effective on the date designated by such law or by regulation.

- B. To ensure the legal and effective performance of this Master Agreement, both parties agree that any amendment that affects the performance under this Master Agreement must be mutually agreed upon and that all such amendments must be in writing. After a period of no less than 30 days subsequent to written notice, unless sooner implementation is required by law, such amendments shall have the effect of qualifying the terms of this Master Agreement and shall be binding upon the parties as if written herein.
- C. Customers have the right to issue a change order to any purchase orders issued to the Contractor for the purposes of clarification or inclusion of additional specifications, qualifications, conditions, etc. The change order must be in writing and agreed upon by Contractor and the Customer agency prior to issuance of any Change Order. A copy of the Change Order must be provided by the Contractor to, and acknowledged by, H-GAC.

**ARTICLE 22: CONTRACT ITEM CHANGES**

- A. If a manufacturer discontinues a contracted item, that item will automatically be considered deleted from the contract with no penalty to Contractor. However, H-GAC may at its sole discretion elect to make a contract award to the next lowest Respondent for the item, or take any other action deemed by H-GAC, at its sole discretion, to be in the best interests of its Customers.
- B. If a manufacturer makes any kind of change in a contracted item which affects the contract price, Contractor must advise H-GAC of the details. H-GAC may allow or reject the change at its sole discretion. If the change is rejected, H-GAC will remove the item from its program and there will be no penalty to Contractor. However, H-GAC may at its sole discretion elect to make a contract award to the next lowest Respondent for the item, or take any other action deemed by H-GAC, at its sole discretion, to be in the best interests of its Customers.
- C. If a manufacturer makes any change in a contracted item which does not affect the contract price, Contractor shall advise H-GAC of the details. If the 'new' item is equal to or better than the originally contracted item, the 'new' item shall be approved as a replacement. If the change is rejected H-GAC will remove the item from its program and there will be no penalty to Contractor. However, H-GAC may at its sole discretion elect to make a contract award to the next lowest Respondent for the item or may take any other action deemed by H-GAC at its sole discretion, to be in the best interests of its Customers.
- D. In the case of specifically identified catalogs or price sheets which have been contracted as base bid items or as published options, routine published changes to products and pricing will be automatically incorporated into the contract. However, Contractor must still provide written notice and an explanation of the changes to products and pricing. H-GAC will respond with written approval.

**ARTICLE 23: CONTRACT PRICE ADJUSTMENTS**

**Price Decreases**

If Contractor's Direct Cost decreases at any time during the full term of this award, Contractor must immediately pass the decrease on to H-GAC and lower its prices by the amount of the decrease in Direct Cost. (Direct Cost means Contractor's cost from the manufacturer of any item or if Contractor is the manufacturer, the cost of raw materials required to manufacture the item, plus costs of transportation from manufacturer to Contractor and Contractor to H-GAC. Contractor must notify H-GAC of price decreases in the same way as for price increases set out below. The price decrease shall become effective upon H-GAC's receipt of Contractor's notice. If Contractor routinely offers discounted contract pricing, H-GAC may request Contractor accept amended contract pricing equivalent to the routinely discounted pricing.

**Price Increase**

Contractors may request a price increase for items priced as Base Bid items and Published Options. The amount of any increase will not exceed actual documented increase in Contractor's Direct Cost and will not exceed 10% of

the previous bid price. Considerations on the percentage limit will be given if the price increase is the result of increased tariff charges or other governmental actions, or other economic factors. Manufacturer price/contract changes involving the sale of motor vehicles will be considered and may be allowed during the entire contract period subject to submission and verification of the proper documentation required for a contract change as referenced in this section.

### **Price Changes**

Any permanent increase or decrease in offered pricing for a base contract item or published option is considered a price change. Temporary increases in pricing by whatever name (e.g., 'surcharge', 'adjustment', 'equalization charge', 'compliance charge', 'recovery charge', etc.), are also considered to be price changes.

For published catalogs and price sheets as part of an H-GAC contract, requests to amend the contract to reflect any new published catalog or price sheet must be submitted whenever the manufacturer publishes a new document. The request must include the new catalog or price sheet. All Products shall, at time of sale, be equipped as required under any then current applicable local, state, and federal government requirements. If, during any contract, changes are made to any government requirements which cause a manufacturer's costs of production to increase, Contractor may increase pricing to the extent of Contractor's actual cost increase. The increase must be substantiated with support documentation acceptable to H-GAC prior to taking effect. Modifications to a Product required to comply with such requirements which become effective after the date of any sale are the responsibility of the Customer.

### **Requesting Price Increase/Required Documentation**

Contractor must submit a written overview of changes requested and reasons for the request, stating the amount of the increase, along with an itemized list of any increased prices, showing the Contractor's current price, revised price, the actual dollar difference and the percentage of the price increase by line item. Price change requests must be supported with substantive documentation (e.g., notices from suppliers and manufacturers of pricing changes in products, components, transportation, raw materials or commodities, and/or product availability, copies of invoices from suppliers, etc.) clearly showing that Contractor's actual costs have increased per the applicable line-item bid. The Producer Price Index (PPI) may be used as partial justification, subject to approval by H-GAC, but no price increase based solely on an increase in the PPI will be allowed. This documentation should be submitted in Excel format to facilitate analysis and updating of the website. The letter and documentation must be sent to Lead Program Coordinator, [james.glover@h-gac.com](mailto:james.glover@h-gac.com).

### **Review/Approval of Requests**

If H-GAC approves the price increase, Contractor will be notified in writing; no price increase will be effective until Contractor receives this notice. If H-GAC does not approve Contractor's price increase, Contractor may terminate its performance upon sixty (60) days advance written notice to H-GAC, however Contractor must fulfill any outstanding Purchase Orders. Termination of performance is Contractor's only remedy if H-GAC does not approve the price increase. H-GAC reserves the right to accept or reject any price change request.

### **ARTICLE 24: DELIVERIES AND SHIPPING TERMS**

The Contractor agrees to make deliveries only upon receipt of authorized Customer Purchase Order acknowledged by H-GAC. Delivery made without such Purchase Order will be at Contractor's risk and will leave H-GAC the option of canceling any contract awarded to the Contractor. The Contractor must secure and deliver any item within five (5) working days, or as agreed to on any corresponding customer Purchase Order.

Shipping must be Freight On Board Destination to the delivery location designated on the Customer purchase order. The Contractor will retain title and control of all goods until delivery is completed and the Customer has accepted the delivery. All risk of transportation and all related charges are the responsibility of the Contractor. The Customer will notify the Contractor and H-GAC promptly of any damaged goods and will assist the Contractor in arranging for inspection. The Contractor must file all claims for visible or concealed damage. Unless otherwise stated in the Master Agreement, deliveries must consist only of new and unused merchandise.

### **ARTICLE 25: RESTOCKING (EXCHANGES AND RETURNS)**

There will be no restocking charge to the Customer for return or exchange of any item purchased under the terms of any award. If the Customer wishes to return items purchased under an awarded contract, the Contractor agrees

to exchange, these items for other items, with no additional charge incurred. Items must be returned to Contractor within thirty (30) days from date of delivery. If there is a difference in price in the items exchanged, the Contractor must notify H-GAC and invoice Customer for increase price or provide the Customer with a credit or refund for any decrease in price per Customer's preference. On items returned, a credit or cash refund will be issued by the Contractor to Customer. This return and exchange option will extend for thirty (30) days following the expiration of the term of the Contract. All items returned by the Customer must be unused and in the same merchantable condition as when received. Items that are special ordered may be returned only upon approval of the Contractor.

#### **ARTICLE 26: MANUALS**

Each product delivered under contract to any Customer must be delivered with at least one (1) copy of a safety and operating manual and any other technical or maintenance manual. The cost of the manual(s) must be included in the price for the Product offered.

#### **ARTICLE 27: OUT OF STOCK, PRODUCT RECALLS, AND DISCONTINUED PRODUCTS**

H-GAC does NOT purchase the products sold pursuant to a Solicitation or Master Agreement. Contractor is responsible for ensuring that notices and mailings, such as Out of Stock or Discontinued Notices, Safety Alerts, Safety Recall Notices, and customer surveys, are sent directly to the Customer with a copy sent to H-GAC. Customer will have the option of accepting any equivalent product or canceling the item from Customer's Purchase Order. Contractor is not authorized to make substitutions without prior approval.

#### **ARTICLE 28: WARRANTIES, SALES, AND SERVICE**

Warranties must be the manufacturer's standard and inclusive of any other warranty requirements stated in the Master Agreement; any warranties offered by a dealer will be in addition to the manufacturer's standard warranty and will not be a substitute for such. Pricing for any product must be inclusive of the standard warranty.

Contractor is responsible for the execution and effectiveness of all product warranty requests and any claims, Contractor agrees to respond directly to correct warranty claims and to ensure reconciliation of warranty claims that have been assigned to a third party.

#### **ARTICLE 29: TERMINATION PROCEDURES**

The Contractor acknowledges that this Master Agreement may be terminated for Convenience or Default. H-GAC will not pay for any expenses incurred after the termination date of the contract.

##### *A. Convenience*

H-GAC may terminate this Master Agreement at any time, in whole or in part, with or without cause, whenever H-GAC determines that for any reason such termination is in the best interest of H-GAC, by providing written notice by certified mail to the Contractor. Upon receipt of notice of termination, all services hereunder of the Contractor and its employees and subcontractors shall cease to the extent specified in the notice of termination.

The Contractor may cancel or terminate this Master Agreement upon submission of thirty (30) days written notice, presented to H-GAC via certified mail. The Contractor may not give notice of cancellation after it has received notice of default from H-GAC.

##### *B. Default*

H-GAC may, by written notice of default to the Contractor, terminate the whole or any part of the Master Agreement, in any one of the following circumstances:

- (1) If the Contractor fails to perform the services herein specified within the time specified herein or any extension thereof; or
- (2) If the Contractor fails to perform any of the other provisions of this Master Agreement for any reason whatsoever, or so fails to make progress or otherwise violates the Master Agreements that completion of services herein specified within the Master Agreement term is significantly endangered, and in either of these two instances does not cure such failure within a period of ten (10) days (or such longer period of time as may be authorized by H-GAC in writing) after receiving written notice by certified mail of default from H-GAC.

- (3) In the event of such termination, Contractor will notify H-GAC of any outstanding Purchase Orders and H-GAC will consult with the End User and notify the Contractor to what extent the End User wishes the Contractor to complete the Purchase Order. If Contractor is unable to do so, Contractor may be subject to a claim for damages from H-GAC and/or the End User.

### **ARTICLE 30: SEVERABILITY**

H-GAC and Contractor agree that should any provision of this Master Agreement be determined to be invalid or unenforceable, such determination shall not affect any other term of this Master Agreement, which shall continue in full force and effect.

### **ARTICLE 31: FORCE MAJEURE**

To the extent that either party to this Master Agreement shall be wholly or partially prevented from the performance of any obligation or duty placed on such party by reason of or through strikes, stoppage of labor, riot, fire, flood, acts of war, insurrection, accident, order of any court, act of God, or specific cause reasonably beyond the party's control and not attributable to its neglect or nonfeasance, in such event, the time for the performance of such obligation or duty shall be suspended until such disability to perform is removed. Determination of force majeure shall rest solely with H-GAC.

### **ARTICLE 32: CONFLICT OF INTEREST**

No officer, member or employee of the Contractor or Contractor's subcontractor, no member of the governing body of the Contractor, and no other public officials of the Contractor who exercise any functions or responsibilities in the review or Contractor approval of this Master Agreement, shall participate in any decision relating to this Master Agreement which affects his or her personal interest, or shall have any personal or pecuniary interest, direct or indirect, in this Master Agreement.

- A. **Conflict of Interest Questionnaire:** Chapter 176 of the Texas Local Government Code requires contractors contracting or seeking to contract with H-GAC to file a conflict-of-interest questionnaire (CIQ) if they have an employment or other business relationship with an H-GAC officer or an officer's close family member. The required questionnaire and instructions are located on the H-GAC website or at the Texas Ethics Commission website <https://www.ethics.state.tx.us/forms/CIQ.pdf>. H-GAC officers include its Board of Directors and Executive Director, who are listed on this website. Respondent must complete and file a CIQ with the Texas Ethics Commission if an employment or business relationship with H-GAC office or an officer's close family member as defined in the law exists.
- B. **Certificate of Interested Parties Form – Form 1295:** As required by Section 2252.908 of the Texas Government Code. H-GAC will not enter a Contract with Contractor unless (i) the Contractor submits a disclosure of interested parties form to H-GAC at the time the Contractor submits the contract H-GAC, or (ii) the Contractor is exempt from such requirement. The required form and instructions are located at the Texas Ethics Commission website [https://www.ethics.state.tx.us/whatsnew/elf\\_info\\_form1295.htm](https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm). Respondents who are awarded a Contract must submit their Form 1295 with the signed Contract to H-GAC.

### **ARTICLE 33: FEDERAL COMPLIANCE**

Contractor agrees to comply with all federal statutes relating to nondiscrimination, labor standards, and environmental compliance. With regards to "Rights to Inventions Made Under a Contract or Master Agreement," If the Federal award meets the definition of "funding Master Agreement" under 37 CFR § 401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding Master Agreement," the recipient or subrecipient must comply with the requirements of 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Master Agreements," and any implementing regulations issued by the awarding agency. Contractor agrees to be wholly compliant with the provisions of 2 CFR 200, Appendix II. Additionally, for work to be performed under the Master Agreement or subcontract thereof, including procurement of materials or leases of equipment, Contractor shall notify each potential subcontractor or supplier of the Contractor's federal compliance obligations. These may include, but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b)

Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§ 1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) the Fair Labor Standards Act of 1938 (29 USC 676 et. seq.), (d) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794), which prohibits discrimination on the basis of handicaps and the Americans with Disabilities Act of 1990; (e) the Age Discrimination in Employment Act of 1967 (29 USC 621 et. seq.) and the Age Discrimination Act of 1974, as amended (42 U.S.C. §§ 6101-6107), which prohibits discrimination on the basis of age; (f) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (g) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to the nondiscrimination on the basis of alcohol abuse or alcoholism; (h) §§ 523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. 290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (i) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. § 3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (j) any other nondiscrimination provisions in any specific statute(s) applicable to any Federal funding for this Master Agreement; (k) the requirements of any other nondiscrimination statute(s) which may apply to this Master Agreement; (l) applicable provisions of the Clean Air Act (42 U.S.C. §7401 et seq.), the Federal Water Pollution Control Act, as amended (33 U.S.C. §1251 et seq.), Section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and the Environmental Protection Agency regulations at 40 CFR Part 15; (m) applicable provisions of the Davis- Bacon Act (40 U.S.C. 276a - 276a-7), the Copeland Act (40 U.S.C. 276c), and the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-332), as set forth in Department of Labor Regulations at 20 CFR 5.5a; (n) the mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (P.L. 94-163).

**ARTICLE 34: PROHIBITION ON CONTRACTING WITH ENTITIES USING CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE EQUIPMENT (EFFECTIVE AUG. 13, 2020 AND AS AMENDED OCTOBER 26, 2020)**

Pursuant to 2 CFR 200.216, Contractor shall not offer equipment, services, or system that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. Covered telecommunications equipment or services means 1) telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities); 2) for the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities); 3) telecommunications or video surveillance services provided by such entities or using such equipment; or 4) telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country. Respondent must comply with requirements for certifications. The provision at 48 C.F.R Section 52.204-26 requires that offerors review SAM prior to completing their required representations. This rule applies to all acquisitions, including acquisitions at or below the simplified acquisition threshold and to acquisitions of commercial items, including commercially available off the-shelf items.

**ARTICLE 35: DOMESTIC PREFERENCE**

In accordance with 2 CFR 200.322, as appropriate and to the extent consistent with law, when using federal grant award funds H-GAC should, to the greatest extent practicable, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). H-GAC must include this requirement in all subawards including all contracts and purchase orders for work or products under the federal grant award. If Contractor intends to qualify for Purchase Orders using federal grant money, then it shall work with H-GAC to provide all required certifications and other documentation needed to show compliance.

**ARTICLE 36: CRIMINAL PROVISIONS AND SANCTIONS**

The Contractor agrees to perform the Master Agreement in conformance with safeguards against fraud and abuse as set forth by the H-GAC, the State of Texas, and the acts and regulations of any related state or federal agency. The Contractor agrees to promptly notify H-GAC of any actual or suspected fraud, abuse, or other criminal activity

through the filing of a written report within twenty-four (24) hours of knowledge thereof. Contractor shall notify H-GAC of any accident or incident requiring medical attention arising from its activities under this Master Agreement within twenty-four (24) hours of such occurrence. Theft or willful damage to property on loan to the Contractor from H-GAC, if any, shall be reported to local law enforcement agencies and H-GAC within two (2) hours of discovery of any such act.

The Contractor further agrees to cooperate fully with H-GAC, local law enforcement agencies, the State of Texas, the Federal Bureau of Investigation, and any other duly authorized investigative unit, in carrying out a full investigation of all such incidents.

The Contractor shall notify H-GAC of the threat of lawsuit or of any actual suit filed against the Contractor pertaining to this Master Agreement or which would adversely affect the Contractor's ability to perform services under this Master Agreement.

**ARTICLE 37: INDEMNIFICATION AND RECOVERY**

H-GAC's liability under this Master Agreement, whether for breach of contract, warranty, negligence, strict liability, in tort or otherwise, is limited to its order processing charge. In no event will H-GAC be liable for any loss of use, loss of time, inconvenience, commercial loss, lost profits, or savings or other incidental, special or consequential damages to the full extent such use may be disclaimed by law. Contractor agrees, to the extent permitted by law, to defend and hold harmless H-GAC, its board members, officers, agents, officials, employees, and indemnities from any and all claims, costs, expenses (including reasonable attorney fees), actions, causes of action, judgements, and liens arising as a result of Contractor's negligent act or omission under this Master Agreement. Contractor shall notify H-GAC of the threat of lawsuit or of any actual suit filed against Contractor relating to this Master Agreement.

**ARTICLE 38: LIMITATION OF CONTRACTOR'S LIABILITY**

Except as specified in any separate writing between the Contractor and an END USER, Contractor's total liability under this Master Agreement, whether for breach of contract, warranty, negligence, strict liability, in tort or otherwise, but excluding its obligation to indemnify H-GAC, is limited to the price of the particular products/services sold hereunder, and Contractor agrees either to refund the purchase price or to repair or replace product(s) that are not as warranted. In no event will Contractor be liable for any loss of use, loss of time, inconvenience, commercial loss, loss of profits or savings or other incidental, special or consequential damages to the full extent such use may be disclaimed by law. Contractor understands and agrees that it shall be liable to repay and shall repay upon demand to END USER any amounts determined by H-GAC, its independent auditors, or any agency of State or Federal government to have been paid in violation of the terms of this Master Agreement.

**ARTICLE 39: TITLES NOT RESTRICTIVE**

The titles assigned to the various Articles of this Master Agreement are for convenience only. Titles shall not be considered restrictive of the subject matter of any Article, or part of this Master Agreement.

**ARTICLE 40: JOINT WORK PRODUCT**

This Master Agreement is the joint work product of H-GAC and the Contractor. This Master Agreement has been negotiated by H-GAC and the Contractor and their respective counsel and shall be fairly interpreted in accordance with its terms and, in the event of any ambiguities, no inferences shall be drawn against any party.

**ARTICLE 41: PROCUREMENT OF RECOVERED MATERIAL**

H-GAC and the Respondent must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include: (1) procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeded \$10,000; (2) procuring solid waste management services in a manner that maximizes energy and resource recovery; and (3) establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines. Pursuant to the Federal Rule above, as required by the Resource Conservation and Recovery Act of 1976 (42 U.S.C. § 6962(c)(3)(A)(i)), Respondent

certifies that the percentage of recovered materials content for EPA-designated items to be delivered or used in the performance of the Contract will be at least the amount required by the applicable contract specifications or other contractual requirements.

**ARTICLE 42: COPELAND “ANTI-KICKBACK” ACT**

Contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into the contract. The contractor or subcontractor shall insert in any subcontracts the clause above and such other clauses as appropriate agency instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses. A breach of the contract clauses above may be grounds for termination of the Contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12.

**ARTICLE 43: DISCRIMINATION**

Respondent and any potential subcontractors shall comply with all Federal statutes relating to nondiscrimination. These include, but are not limited to:

- a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352), which prohibits discrimination on the basis of race, color, or national origin;
- b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex;
- c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps;
- d) The Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101- 6107), which prohibits discrimination on the basis of age;
- e) The Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse;
- f) The Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism;
- g) Sections 523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records;
- h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental, or financing of housing;
- i) Any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and
- j) The requirements of any other nondiscrimination statute(s) that may apply to the application.

**ARTICLE 44: DRUG FREE WORKPLACE**

Contractor must provide a drug-free workplace in accordance with the Drug-Free Workplace Act, as applicable. For the purposes of this Section, “drug-free” means a worksite at which employees are prohibited from engaging in the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance. H-GAC may request a copy of this policy.

**ARTICLE 45: APPLICABILITY TO SUBCONTRACTORS**

Respondent agrees that all contracts it awards pursuant to the contract awarded as a result of this Master Agreement will be bound by the foregoing terms and conditions.

**ARTICLE 46: WARRANTY AND COPYRIGHT**

Submissions must include all warranty information, including items covered, items excluded, duration, and renewability. Submissions must include proof of licensing if using third party code for programming.

**ARTICLE 47: DATA HANDLING AND SECURITY**

It will always be the responsibility of the selected Contractor to manage data transfer and to secure all data appropriately during the project to prevent unauthorized access to all data, products, and deliverables.

**ARTICLE 48: DISPUTES**

All disputes concerning questions of fact or of law arising under this Master Agreement, which are not addressed within the Whole Master Agreement as defined pursuant to Article 4 hereof, shall be decided by the Executive Director of H-GAC or his designee, who shall reduce his decision to writing and provide notice thereof to the Contractor. The decision of the Executive Director or his designee shall be final and conclusive unless, within thirty (30) days from the date of receipt of such notice, the Contractor requests a rehearing from the Executive Director of H-GAC. In connection with any rehearing under this Article, the Contractor shall be afforded an opportunity to be heard and offer evidence in support of its position. The decision of the Executive Director after any such rehearing shall be final and conclusive. The Contractor may, if it elects to do so, appeal the final and conclusive decision of the Executive Director to a court of competent jurisdiction. Pending final decision of a dispute hereunder, the Contractor shall proceed diligently with the performance of the Master Agreement and in accordance with H-GAC's final decision.

**ARTICLE 49: CHOICE OF LAW: VENUE**

This Master Agreement shall be governed by the laws of the State of Texas. Venue and jurisdiction of any suit or cause of action arising under or in connection with the Master Agreement shall lie exclusively in Harris County, Texas. Disputes between END USER and Contractor are to be resolved in accordance with the law and venue rules of the state of purchase. Contractor shall immediately notify H-GAC of such disputes.

**ARTICLE 50: ORDER OF PRIORITY**

In the case of any conflict between or within this Master Agreement, the following order of priority shall be utilized: 1) General Provisions, 2) Special Provisions, 3) Scope of Work, and 4) Other Attachments.

**ARTICLE 51: WHOLE MASTER AGREEMENT**

**Please note, this is an H-GAC Master Agreement template and is used for all products and services offered in H-GAC Cooperative Purchasing. Any redlines to this Master Agreement may not be reviewed. If this Master Agreement has not been signed by the Contractor within 30 calendar days, this Master Agreement will be automatically voided.** The Master General Provisions, Master Special Provisions, and Attachments, as provided herein, constitute the complete Master Agreement between the parties hereto, and supersede any and all oral and written Master Agreements between the parties relating to matters herein. Except as otherwise provided herein, this Master Agreement cannot be modified without written consent of the parties.

**ARTICLE 52: UNIVERSAL IDENTIFIER AND SYSTEM FOR AWARD MANAGEMENT (SAM)**

In accordance with 2 CFR Title 2, Subtitle A, Chapter I, Part 25 as it applies to a Federal awarding agency's grants, cooperative agreements, loans, and other types of Federal financial assistance as defined in 2 CFR 25.406.

Contractor understands and as it relates to 2 CFR 25.205(a), a Federal awarding agency may not make a Federal award or financial modification to an existing Federal award to an applicant or recipient until the entity has complied with the requirements described in 2 CFR 25.200 to provide a valid unique entity identifier and maintain an active SAM registration ([www.SAM.gov](http://www.SAM.gov)) with current information (other than any requirement that is not applicable because the entity is exempted under § 25.110). 2 CFR 25.200(b) requires that registration in the SAM **prior to submitting an application or plan**; and maintain an active SAM registration with current information, including information on a recipient's immediate and highest level owner and subsidiaries, as well as on all predecessors that have been awarded a Federal contract or grant within the last three years, if applicable, at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding agency; and provide its unique entity identifier in each application or plan it submits to the Federal awarding agency. To remain registered in the SAM database after the initial registration, the applicant is required to review and update its information in the SAM database on an annual basis from the date of initial registration or subsequent updates to ensure it is current, accurate and complete. At the time a Federal awarding agency is ready to make a Federal award, if the intended recipient has not complied with an applicable requirement to provide a unique entity identifier or maintain an active SAM registration with current information, the Federal awarding agency: (1) May determine that the applicant is not qualified to receive a Federal award; and (2) May use that determination as a basis for making a Federal award to another applicant.

**ARTICLE 53: PROCUREMENT OF RECOVERED MATERIALS**

In accordance with 2 CFR 200.323, the Houston-Galveston Area Council and the Contractor or Subrecipient must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include: (1) procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeded \$10,000; (2) procuring solid waste management services in a manner that maximizes energy and resource recovery; and (3) establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines. Pursuant to the Federal Rule above, as required by the Resource Conservation and Recovery Act of 1976 (42 U.S.C. § 6962(c)(3)(A)(i)), the Contractor or Subrecipient certifies that the percentage of recovered materials content for EPA-designated items to be delivered or used in the performance of the Agreement will be at least the amount required by the applicable contract specifications or other contractual requirements.

**SIGNATURES:**

H-GAC and the Contractor have read, agreed, and executed the whole Master Agreement as of the date first written above, as accepted by:

**Hughes Fire Equipment, Inc.**

Signature  DocuSigned by:  
3F2ABE9A2EDC46E...

Name Rex Hughes

Title President

Date 12/29/2023

**H-GAC**

Signature  DocuSigned by:  
82EC270D5D61423...

Name Chuck Wemple

Title Executive Director

Date 1/3/2024

# H-GAC

Houston-Galveston Area Council

P.O. Box 22777 · 3555 Timmons · Houston, Texas 77227-2777

**Cooperative Agreement - Contract - Hughes Fire Equipment, Inc. - Public Services - ID: 11604**

## MASTER SPECIAL PROVISIONS

**Please note, this is an H-GAC Master Agreement template and is used for all products and services offered in H-GAC Cooperative Purchasing. Any redlines to this Master Agreement may not be reviewed.** Incorporated by attachment, as part of the whole Master Agreement, H-GAC and the Contractor do, hereby agree to the Master Special Provisions as follows:

### **ARTICLE 1: BIDS/PROPOSALS INCORPORATED**

In addition to the whole Master Agreement, the following documents listed in order of priority are incorporated into the Master Agreement by reference: Bid/Proposal Specifications and Contractor's Response to the Bid/Proposal.

### **ARTICLE 2: END USER MASTER AGREEMENTS ("EUA")**

H-GAC acknowledges that the END USER, which is the HGACBuy customer utilizing the contract (CUSTOMER and END USER may be used interchangeably) may choose to enter into an End User Master Agreement (EUA) with the Contractor through this Master Agreement. A CUSTOMER/END USER is a state agency, county, municipality, special district, or other political subdivision of a state, or a qualifying non-profit corporation (providing one or more governmental function or service that possess legal authority to enter into the Contract. The term of the EUA may exceed the term of the current H-GAC Master Agreement.

H-GAC's acknowledgement is not an endorsement or approval of the End User Master Agreement's terms and conditions. Contractor agrees not to offer, agree to or accept from the CUSTOMER/END USER, any terms or conditions that conflict with those in Contractor's Master Agreement with H-GAC. Contractor affirms that termination of its Master Agreement with H-GAC for any reason shall not result in the termination of any underlying EUA, which shall in each instance, continue pursuant to the EUA's stated terms and duration. Pursuant to the terms of this Master Agreement, termination of this Master Agreement will disallow the Contractor from entering into any new EUA with CUSTOMER/END USER. Applicable H-GAC order processing charges will be due and payable to H-GAC on any EUAs, surviving termination of this Master Agreement between H-GAC and Contractor.

### **ARTICLE 3: MOST FAVORED CUSTOMER CLAUSE**

Contractor shall provide its most favorable pricing and terms to H-GAC. If at any time during this Master Agreement, Contractor develops a regularly followed standard procedure of entering into Master Agreements with other governmental customers within the State of Texas, and offers the same or substantially the same products/services offered to H-GAC on a basis that provides prices, warranties, benefits, and or terms more favorable than those provided to H-GAC, Contractor shall notify H-GAC within ten (10) business days thereafter, and this Master Agreement shall be deemed to be automatically retroactively amended, to the effective date of Contractor's most favorable past Master Agreement with another entity. Contractor shall provide the same prices, warranties, benefits, or terms to H-GAC and its CUSTOMER/END USER as provided in its most favorable past Master Agreement. H-GAC shall have the right and option at any time to decline to accept any such change, in which case the amendment shall be deemed null and void. If Contractor claims that a more favorable price, warranty, benefit, or term that was charged or offered to another entity during the term of this Master Agreement, does not constitute more favorable treatment, than Contractor shall, within ten (10) business days, notify H-GAC in writing, setting forth the detailed reasons Contractor believes the aforesaid

offer is not in fact most favored treatment. H-GAC, after due consideration of Contractor's written explanation, may decline to accept such explanation and thereupon this Master Agreement between H-GAC and Contractor shall be automatically amended, effective retroactively, to the effective date of the most favored Master Agreement, to provide the same prices, warranties, benefits, or terms to H-GAC and the CUSTOMER/END USER.

**EXCEPTION:** This clause shall not be applicable to prices and price adjustments offered by a bidder, proposer, or contractor, which are not within bidder's/proposer's control [example; a manufacturer's bid concession], or to any prices offered to the Federal Government and its agencies.

**ARTICLE 4: PARTY LIABILITY**

Contractor's total liability under this Master Agreement, whether for breach of contract, warranty, negligence, strict liability, in tort or otherwise, is limited to the price of the particular products/services sold hereunder. Contractor agrees either to refund the purchase price or to repair or replace product(s) that are not as warranted. Contractor accepts liability to repay, and shall repay upon demand to CUSTOMER/END USER, any amounts determined by H-GAC, its independent auditors, or any state or federal agency, to have been paid in violation of the terms of this Master Agreement.

**ARTICLE 5: GOVERNING LAW & VENUE**

Contractor and H-GAC agree that Contractor will make every reasonable effort to resolve disputes with the CUSTOMER/END USER in accord with the law and venue rules of the state of purchase. Contractor shall immediately notify H-GAC of such disputes.

**ARTICLE 6: SALES AND ORDER PROCESSING CHARGE**

Contractor shall sell its products to CUSTOMER/END USER based on the pricing and terms of this Master Agreement. H-GAC will invoice Contractor for the applicable order processing charge when H-GAC receives notification of a CUSTOMER/END USER order. Contractor shall remit to H-GAC the full amount of the applicable order processing charge, after delivery of any product or service and subsequent CUSTOMER/END USER acceptance. Payment of the Order Processing Charge shall be remitted from Contractor to H-GAC, within thirty (30) calendar days or ten (10) business days after receipt of a CUSTOMER/END USER's payment, whichever comes first, notwithstanding Contractor's receipt of invoice. For sales made by Contractor based on this Master Agreement, including sales to entities without Interlocal Master Agreements, Contractor shall pay the applicable order processing charges to H-GAC. Further, Contractor agrees to encourage entities who are not members of H-GAC's Cooperative Purchasing Program to execute an H-GAC Interlocal Master Agreement. H-GAC reserves the right to take appropriate actions including, but not limited to, Master Agreement termination if Contractor fails to promptly remit the appropriate order processing charge to H-GAC. In no event shall H-GAC have any liability to Contractor for any goods or services a CUSTOMER/END USER procures from Contractor. At all times, Contractor shall remain liable to pay to H-GAC any order processing charges on any portion of the Master Agreement actually performed, and for which compensation was received by Contractor.

**ARTICLE 7: LIQUIDATED DAMAGES**

Contractor and H-GAC agree that Contractor shall cooperate with the CUSTOMER/END USER at the time a CUSTOMER/END USER purchase order is placed, to determine terms for any liquidated damages.

**ARTICLE 8: INSURANCE**

Unless otherwise stipulated in Section B of the Bid/Proposal Specifications, Contractor must have the following insurance and coverage minimums:

- a. General liability insurance with a Single Occurrence limit of at least \$1,000,000.00, and a General Aggregate limit of at least two times the Single Occurrence limit.
- b. Product liability insurance with a Single Occurrence limit of at least \$1,000,000.00, and a General Aggregate limit of at least two times the Single Occurrence limit for all Products except Automotive Fire Apparatus. For Automotive Fire Apparatus, see Section B of the Bid/Proposal Specifications.
- c. Property Damage or Destruction insurance is required for coverage of End User owned equipment while in Contractor's possession, custody, or control. The minimum Single Occurrence limit is \$500,000.00 and the General Aggregate limit must be at least two times the Single Occurrence limit. This insurance may be carried in several ways, e.g. under an Inland Marine policy, as art of Automobile coverage, or under a Garage Keepers policy. In any event, this coverage must be specifically and clearly listed on insurance certificate(s) submitted to H-GAC.
- d. Insurance coverage shall be in effect for the length of any contract made pursuant to the Bid/Proposal, and for any extensions thereof, plus the number of days/months required to deliver any outstanding order after the close of the contract period.
- e. Original Insurance Certificates must be furnished to H-GAC on request, showing Contractor as the insured and showing coverage and limits for the insurances listed above.
- f. If any Product(s) or Service(s) will be provided by parties other than Contractor, all such parties are required to carry the minimum insurance coverages specified herein, and if requested by H-GAC, a separate insurance certificate must be submitted for each such party.
- g. H-GAC reserves the right to contact insurance underwriters to confirm policy and certificate issuance and document accuracy.

#### **ARTICLE 9: PERFORMANCE AND PAYMENT BONDS FOR INDIVIDUAL ORDERS**

H-GAC's contractual requirements DO NOT include a Performance & Payment Bond (PPB); therefore, Contractor shall offer pricing that reflects this cost savings. Contractor shall remain prepared to offer a PPB to cover any order if so requested by the CUSTOMER/END USER. Contractor shall quote a price to CUSTOMER/END USER for provision of any requested PPB, and agrees to furnish the PPB within ten business (10) days of receipt of CUSTOMER/END USER's purchase order.

#### **ARTICLE 10: ORDER PROCESSING CHARGE**

H-GAC will apply an Order Processing Charge for each sale done through the H-GAC contract, with the exception of orders for motor vehicles. Any pricing submitted must include this charge amount per the most current H-GAC schedule. For motor vehicle orders, the Processing Charge is paid by the CUSTOMER/END USER. Contractor will need to refer to the solicitation for the Order Processing Charge.

#### **ARTICLE 11: CHANGE OF STATUS**

Contractor shall immediately notify H-GAC, in writing, of ANY change in ownership, control, dealership/franchisee status, Motor Vehicle license status, or name. Contractor shall offer written guidance to advise H-GAC if this Master Agreement shall be affected in any way by such change. H-GAC shall have the right to determine whether or not such change is acceptable, and to determine what action shall be warranted, up to and including cancellation of Master Agreement.

#### **ARTICLE 12: REQUIREMENTS TO APPLICABLE PHYSICAL GOODS**

In the case of physical goods (e.g. equipment, material, supplies, as opposed to services), all Products offered must comply with any applicable provisions of the Texas Business and Commerce Code, Title 1, Chapter 2 and with at least the following:

- a. Be new, unused, and not refurbished.
- b. Not be a prototype as the general design, operation, and performance. This requirement is NOT meant to preclude the Contractor from offering new models or configurations which incorporate improvements in a current design or add functionality, but in which new model or configuration may be new to the marketplace.
- c. Include all accessories which may or may not be specifically mentioned in the Master Agreement, but which are normally furnished or necessary to make the Product ready for its intended use upon delivery. Such accessories shall be assembled, installed, and adjusted to allow continuous operation of Product at time of delivery.
- d. Have assemblies, sub-assemblies and component parts that are standard and interchangeable throughout the entire quantity of a Product as may be purchased simultaneously by any END USER/CUSTOMER.
- e. Be designed and constructed using current industry accepted engineering and safety practices, and materials.
- f. Be available for inspection at any time prior to or after procurement.

### **ARTICLE 13: TEXAS MOTOR VEHICLE BOARD LICENSING**

All Contractors that deal in motor vehicles shall maintain current licenses that are required by the Texas Motor Vehicle Commission Code. If at any time during this Master Agreement term, any required Contractor license is denied, revoked, or not renewed, Contractor shall be in default of this Master Agreement, unless the Texas Motor Vehicle Board issues a stay or waiver. Contractor shall promptly provide copies of all current applicable Texas Motor Vehicle Board documentation to H-GAC upon request.

### **ARTICLE 14: INSPECTION/TESTING**

All Products sold pursuant to this Master Agreement will be subject to inspection/testing by or at the direction of H-GAC and/or the ordering CUSTOMER/END USER, either at the delivery destination or the place of manufacture. In the event a Product fails to meet or exceed all requirements of this Master Agreement, and unless otherwise agreed in advance, the cost of any inspection and/or testing, will be the responsibility of the Contractor.

### **ARTICLE 15: ADDITIONAL REPORTING REQUIREMENTS**

Contractor agrees to submit written quarterly reports to H-GAC detailing all transactions during the previous three (3) month period. Reports must include, but are not limited, to the following information:

- a. CUSTOMER/END USER Name
- b. Product/Service purchased, including Product Code if applicable
- c. Customer Purchase Order Number
- d. Purchase Order Date
- e. Product/Service dollar amount
- f. HGACBuy Order Processing Charge amount

### **ARTICLE 16: BACKGROUND CHECKS**

Cooperative customers may request background checks on any awarded contractor's employees who will have direct contact with students, or for any other reason they so choose, any may require contractor to pay the cost of obtaining any background information requested by the CUSTOMER/END USER.

### **ARTICLE 17: PROHIBITION ON CONTRACTS WITH COMPANIES BOYCOTTING ISRAEL CERTIFICATION**

As required by Chapter 2271 of the Texas Local Government Code the Contractor must verify that it 1) does not boycott Israel; and 2) will not boycott Israel during the term of the Contract. Pursuant to Section 2271.001, Texas Government Code:

1. “Boycott Israel” means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes; and

2. “Company” means a for-profit sole proprietorship, organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or any limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of those entities or business associations that exist to make a profit.

**ARTICLE 18: NO EXCLUDED NATION OR TERRORIST ORGANIZATION CERTIFICATION**

As required by Chapter 2252 of the Texas Government Code the Contractor must certify that it is not a company engaged in active business operations with Sudan, Iran, or a foreign terrorist organization – specifically, any company identified on a list prepared and maintained by the Texas Comptroller under Texas Government Code §§806.051, 807.051, or 2252.153. (A company that the U.S. Government affirmatively declares to be excluded from its federal sanctions regime relating to Sudan, Iran, or any federal sanctions regime relating to a foreign terrorist organization is not subject to the contract prohibition.)

**ARTICLE 19: PROHIBITION ON CONTRACTING WITH ENTITIES USING CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE EQUIPMENT (Effective Aug. 13, 2020 and as amended October 26, 2020)**

Pursuant to 2 CFR 200.216, Contractor shall not offer equipment, services, or system that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. “Covered telecommunications equipment or services means 1) telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities); 2) for the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities); 3) telecommunications or video surveillance services provided by such entities or using such equipment; or 4) telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

Contractor must comply with requirements for certifications. The provision at 48 C.F.R Section 52.204-26 requires that Contractors review SAM prior to completing their required representations. This rule applies to all acquisitions, including acquisitions at or below the simplified acquisition threshold and to acquisitions of commercial items, including commercially available off the-shelf items.

**ARTICLE 20: BUY AMERICA ACT (National School Lunch Program and Breakfast Program)**

With respect to products purchased by CUSTOMER/END USER for use in the National School Lunch Program and/or National School Breakfast Program, Contractor shall comply with all federal procurement laws and regulations with respect to such programs, including the Buy American provisions set forth in 7 C.F.R. Part 210.21(d), to the extent applicable. Contractor agrees to provide all certifications required by CUSTOMER/END USER regarding such programs.

In the event Contractor or Contractor’s supplier(s) are unable or unwilling to certify compliance with the Buy American Provision, or the applicability of an exception to the Buy American provision, H-GAC CUSTOMER/END USER may decide not to purchase from Contractor. Additionally, H-GAC

CUSTOMER/END USER may require country of origin on all products and invoices submitted for payment by Contractor, and Contractor agrees to comply with any such requirement.

**ARTICLE 21: BUY AMERICA REQUIREMENT (Applies only to Federally Funded Highway and Transit Projects)**

With respect to products purchased by CUSTOMER/END USER for use in federally funded highway projects, Contractor shall comply with all federal procurement laws and regulations with respect to such projects, including the Buy American provisions set forth in 23 U.S.C. Section 313, 23 C.F.R. Section 635.410, as amended, and the Steel and Iron Preference provisions of Texas Transportation Code Section 223.045, to the extent applicable. Contractor agrees to provide all certifications required by CUSTOMER/END USER regarding such programs. With respect to products purchased by CUSTOMER/END USER for use in federally funded transit projects, Contractor shall comply with all federal procurement laws and regulations with respect to such projects, including the Buy American provisions set forth in 49 U.S.C. Section 5323(j)(1), 49 C.F.R. Sections 661.6 or 661.12, to the extent applicable. Contractor agrees to provide all certifications required by CUSTOMER/END USER regarding such programs.

**ARTICLE 22: DOMESTIC PREFERENCE**

In accordance with 2 CFR 200.322, as appropriate and to the extent consistent with law, a CUSTOMER/END USER using federal grant award funds should, to the greatest extent practicable, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The CUSTOMER/END USER must include this requirement in all subawards including all contracts and purchase orders for work or products under the federal grant award. If Contractor intends to qualify for Purchase Orders using federal grant money, they shall work with the CUSTOMER/END USER to provide all required certifications and other documentation needed to show compliance.

**ARTICLE 23: TITLE VI REQUIREMENTS**

H-GAC in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any disadvantaged business enterprises will be afforded full and fair opportunity to submit in response to this Master Agreement and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

**ARTICLE 24: EQUAL EMPLOYMENT OPPORTUNITY**

Except as otherwise provided under 41 CFR Part 60, all Contracts and CUSTOMER/END USER Purchase Orders that meet the definition of “federally assisted construction contract” in 41 CFR Part 60-1.3 shall be deemed to include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, “Equal Employment Opportunity” (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., pg.339), as amended by Executive Order 11375, “Amending Executive Order 11246 Relating to Equal Employment Opportunity,” and implementing regulations at 41CFR Part 60, “Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor.”

The equal opportunity clause provided under 41 CFR 60-1.4(b) is hereby incorporated by reference. Contractor agrees that such provision applies to any contract that meets the definition of “federally assisted construction contract” in 41 CFR Part 60-1.3 and agrees that it will comply with such provision.

**ARTICLE 25: CLEAN AIR AND WATER POLLUTION CONTROL ACT**

CUSTOMER/END USER Purchase Orders using federal funds must contain a provision that requires the Contractor to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean

Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

Pursuant to the Federal Rule above, Contractor certifies that it is in compliance with all applicable provisions of the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387) and will remain in compliance during the term of the Contract.

**ARTICLE 26: PREVAILING WAGE**

Contractor and any potential subcontractors have a duty to and shall pay the prevailing wage rate under the Davis-Bacon Act, 40 U.S.C. 276a – 276a-5, as amended, and the regulations adopted thereunder contained in 29 C.F.R. pt. 1 and 5.

**ARTICLE 27: CONTRACT WORK HOURS AND SAFETY STANDARDS**

As per the Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708), where applicable, all CUSTOMER/END USER Purchase Orders in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer, on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

**ARTICLE 28: PROFIT AS A SEPARATE ELEMENT OF PRICE**

For purchases using federal funds more than the current Simplified Acquisition Threshold of \$250,000, requires negotiation of profit as a separate element of the price. See, 2 CFR 200.324(b). Contractor agrees to provide information and negotiate regarding profit as a separate element of the price for the purchase. Contractor also agrees that the total price, including profit, charged by Contractor will not exceed the awarded pricing, including any applicable discount, under any awarded contract.

**ARTICLE 29: BYRD ANTI-LOBBYING AMENDMENT**

Byrd Anti-Lobbying Amendment (31U.S.C. 1352) – Contractors that apply or bid for an award exceeding \$100,000 must file the required anti-lobbying certification. Each tier must certify to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier, up to the CUSTOMER/END USER. As applicable, Contractor agrees to file all certifications and disclosures required by, and otherwise comply with, the Byrd Anti-Lobbying Amendment (31 USC 1352). Contractor certifies that it is currently in compliance with all applicable provisions of the Byrd Anti-Lobbying Amendment (31 U.S.C. 1352) and will continue to be in compliance throughout the term of the Contract and further certifies that:

1. No Federal appropriated funds have been paid or will be paid by or on behalf of the Contractor, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection

with the awarding of a Federal contract, the making of a Federal Grant, the making of a Federal Loan, the entering into a cooperative Master Agreement, and the extension, continuation, renewal, amendment, or modification of a Federal contract, grant, loan, or cooperative Master Agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing, or attempting to influence, an officer or employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative Master Agreement, Contractor shall complete and submit Standard Form – LLL, “Disclosure Form to Report Lobbying”, in accordance with its instructions.
3. Contractor shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative Master Agreements) and that all subcontractors shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certificate is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

**ARTICLE 30: COMPLIANCE WITH EPA REGULATIONS APPLICABLE TO GRANTS, SUBGRANTS, COOPERATIVE MASTER AGREEMENTS, AND CONTRACTS**

Contractor certifies compliance with all applicable standards, orders, regulations, and/or requirements issued pursuant to the Clean Air Act of 1970, as amended (42 U.S.C. 1857(h)), Section 508 of the Clean Water Act, as amended (13 U.S.C. 1368), Executive Order 117389 and Environmental Protection Agency Regulation, 40 CFR Part 15.

**ARTICLE 31: COMPLIANCE WITH ENERGY POLICY AND CONSERVATION ACT**

Contractor certifies that Contractor will be in compliance with mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. L. 94-163, 89 Stat. 871).

# Fire Apparatus and Related Vehicles

Request For Proposal  
HGACBuy/Cooperative Purchasing Program  
07230

**Project ID:** FS12-23

**Release Date:** Wednesday, July 26, 2023

· **Due Date:** Thursday, September 14, 2023 12:00pm

Posted Wednesday, July 26, 2023 7:00am

Bid Unsealed Thursday, September 14, 2023 12:05pm

Pricing Unsealed Thursday, September 14, 2023 12:05pm

## 4. Specifications/Categories/Scope of Work

*This is an indefinite quantity/indefinite delivery offerings contract. The HGACBuy Customer is responsible to ensure adequate competition is performed between the various contractors or contractors outside of HGACBuy to determine price reasonableness that might be required per any funding agency. Customer will need to ensure compliance with any funding agency requirements before proceeding with a purchase order under this contract. Please consult legal counsel regarding questions concerning compliance as a contractor under this solicitation.*

### 4.1. Overview

H-GAC is soliciting responses for selecting qualified manufacturers, dealers, distributors, and service providers of Fire Apparatus and Other Special Service Vehicles and related services to make these types of products and services available to Customers of the HGACBuy Cooperative Purchasing Program under blanket type contracts. Customers (end users) may require selective acquisitions of equipment and/or services OR full turnkey projects necessitating additional services, training, and maintenance agreements. H-GAC is seeking the broadest possible selection of available fire apparatus and special service vehicles to best serve our customers by providing the largest selection of products/services available to meet their needs. This solicitation may include a request for a discount percent off price catalog, category, or manufacturer, or price list for supplies, materials, or not to exceed hourly rates for installation or repair. Respondents are not required to provide offerings on all categories. Please note: awarded contracts for FS12-23 allow contractors to update their manufacturer pricing and product offerings at any time during the course of the four-year contract term.

### 4.2. Categories

This Solicitation is divided into twelve (12) separate but related product categories (A-L). When submitting a response, Respondent may choose to submit a response to any of the categories or all of them. No additional weighted value will be assigned to a response that addresses more than one or all categories listed. All equipment must be the manufacturer's new and current model and must be fully operational upon delivery to the Customer.

This solicitation does not include ambulances - please see HGACBuy Contract AM10-20 and AM10-23.

Alternative Fuel Vehicles: All responses that include electric, hybrid, or other alternative fuel vehicles must include these vehicles in Category I. If that specific vehicle is also available with an internal combustion engine (ICE),

please list the ICE vehicle separately in the appropriate vehicle category. Category I will only include the alternative fuel vehicles, regardless of vehicle function or type.

Product categories are as follows:

A. **Wildland Fire Apparatus - Brush Fire, Off-Road Tenders/Tankers, Crew Carriers, Slip-in Units, etc.**

Response listings/descriptions must be organized by major sub-categories, which include Manufacturer, type/function, model, chassis (make and model), cab configuration, 2WD/4WD, and fuel type, and tank and pump.

B. **Aerial Fire Apparatus - Boom/Platform, Ladder, Ladder/Platform, etc.**

Response listings/descriptions must be organized by major sub-categories, which include Manufacturer, model, chassis, aerial category/construction, aerial functions, cab types, and axle configurations.

C. **Pumper Fire Apparatus**

Response listings/descriptions must be organized by major sub-categories, which include Manufacturer, model, chassis, cab types, axle configurations, tank capacities/construction, and pump capacity/position.

D. **Pumper-Tanker/Tanker/Tender Fire Apparatus**

Response listings/descriptions must be organized by major sub-categories, which include Manufacturer, model, chassis, cab types, axle configurations, tank capacities/construction, and pump capacity/position.

E. **Aircraft Rescue & Fire-Fighting Vehicles (ARFF)**

Response listings/descriptions must be organized by major sub-categories including Manufacturer, model, chassis, cab types, axle configurations, and by Class Types 1-5.

F. **Special Service Apparatus – Rescue/Fast Response, Re-Hab, Hazmat, Mobile Emergency Command/Communication Centers/Trailers, Light/Air Vehicle, Dive Response Vehicle, ATV/UTV Response Vehicles, Mobile Fire Pump Testers, etc.**

Response listings/descriptions must be organized by Manufacturer, function, type, or purpose of the apparatus/vehicle, and include brief and concise details about the vehicle.

G. **Fire Boats, Rescue Boats, Emergency Response Boats**

Response listings/descriptions must be organized by major sub-categories including Manufacturer, type, function, size, and propulsion.

H. **Fire Command Vehicles - Light, medium, and heavy-duty pickups and SUVs**

Response listings/descriptions must be organized by major sub-categories including Manufacturer, model, chassis, and 2WD/4WD, fuel type.

### **I. Electric/Alternative Fuel Fire Apparatus**

Response listings/descriptions must be organized by major sub-categories including Manufacturer, model, chassis, vehicle type, fuel/propulsion type, and function.

### **J. Fire Apparatus/Vehicle Service/Maintenance Plans**

Response listings/descriptions must include plan details, including details about which fees are included in costs, and items such as labor rates, and fee structures.

### **K. Fire Apparatus/Vehicle Parts and Supplies**

Response listing need only to include percentage discount.

### **L. Fire Apparatus/Vehicle Options**

Please provide a complete listing or catalog of options, accessories, and loose equipment offered. Please clearly indicate if the options are model or vehicle specific, or only available for specific models or vehicles. Options must be clearly identified as upgrades or downgrades and clearly show the net effect to the price of the base model.

(Please upload in Section 9.1.4 Required Documents.)

## **4.3. General Requirements**

All products priced and sold pursuant to this Solicitation must, as applicable:

1. Meet all applicable requirements of federal, state and local laws and regulations.
2. Be manufacturer's normal offering with all standard features and functions and performance levels.
3. Be ready for turn-key operation upon delivery.
4. Respondent must include specifications, brochures, warranty information, and any other relevant product information with solicitation Response.

Note: "Unpriced/unpublished" options cannot be quoted on the Base Pricing List and may not be sold through this contract.

## **4.4. Additional Requirements**

### **Licenses**

1. Contractor must have and maintain the appropriate license(s) as required by the State of Texas, Department of Transportation, Department of Motor Vehicles, Motor Vehicle Commission Code [latest edition], or any other local, state and federal licenses required and which are applicable to the respondent's operations.
2. The prescribed licenses must include the manufacturer/respondent, and any and all dealers and their representatives as may be required by the Motor Vehicle Department. Contractor must ensure all

emergency and specialty vehicles sold are in accordance with the laws of the state where the sale and acquisition are made.

3. Contractor must maintain all licensing required by the State of Texas as applicable to their business operations during the entire contract term. If during the contract period such licensing lapses, Contractor will be in default and become subject to contract termination unless issued a stay or waiver.

### **Manuals**

1. Contractor must supply at the time of delivery, at least two (2) sets of complete operations and service documentation covering the completed emergency vehicles as delivered and accepted.
2. Respondent must supply the following information with their response: Technical Specifications, Product Brochures, Tear Sheets, Cut Sheets, Strippers, etc. which clearly show all the standard features and capabilities of each response listing.

### **Warranty**

Contractors must comply with the minimum warranty and maintenance requirements described below for any products or services provided under this Solicitation.

1. Contractor must furnish with response, and for all equipment sold through this H-GAC contract, the manufacturer's general warranty, which must be honored by all the manufacturer's authorized service locations.
2. All service/maintenance plan listings must clearly indicate the cost structure for such plans, clearly indicating which costs and fees are included (such as: hourly labor rates, shop fees, supply fees, environmental fees).
3. The Contractor will handle all warranty claims and all work must be completed within ten (10) calendar days after receipt of equipment/vehicle by the Contractor without cost to H-GAC or the Customer. Delayed warranties must be available for all vehicles and equipment. Warranty start date will be effective the date that the completed unit is placed into service by the Customer. The Contractor must furnish a delayed warranty card/document for each unit delivered and/or advise the Customer of the procedures to be followed for obtaining the delayed start of warranty coverage. Requests for delayed warranties will not exceed six months after delivery.
4. Any and all documents necessary to effect manufacturer's warranty must be properly applied for and submitted by the Contractor. The Contractor will provide to H-GAC and the Customer a manufacturer's warranty which will be honored by any of the manufacturer's authorized dealers and a complete copy must be provided at the time of delivery. When additional warranties are available as standard, they must be included as a part of the response for the benefit of H-GAC and Customer.
5. The patient compartment, all modifications to the OEM chassis by Contractor on the accepted unit, and equipment and parts will be guaranteed for a minimum period of one (1) year against defects in design,

materials, and workmanship. The warranty period will begin upon final acceptance of the equipment. This warranty will cover parts and labor expenses.

6. In the event any component part of equipment or materials furnished under these specifications, or its subsequent contract(s), becomes defective by reason of material or workmanship during said period, and the end user agency immediately notifies Contractor of such defect, Contractor will, at no expense to the End User agency or H-GAC, repair or replace equipment or component with new equipment or component.
7. Warranty of all system equipment is the sole responsibility of the Contractor under contract, but may be performed by their certified, designated agent.

#### 4.5. Vehicle Requirements

All equipment and vehicles must be new and be the manufacturer's latest and current model. Each vehicle must be fully assembled, adjusted, serviced and ready for immediate and continuous operation upon delivery. If the equipment or vehicle does not meet the specification requirements upon delivery, Contractor will be responsible for correcting all deficiencies and making any corrections or adjustments needed to attain specification requirements.

All equipment and vehicles must conform to applicable local, state, federal requirements and must comply to all applicable industry standards including National Fire Protection Association (NFPA), Department of Transportation, United States Coast Guard (USCG), and Occupational Safety and Health Administration (OSHA).

#### 4.6. Service / Maintenance Plans and Parts

All service/maintenance plan listings must clearly indicate the cost structure for such plans, including which costs and fees are included (ex: hourly labor rates, shop fees, supply fees, environmental fees).

#### 4.7. Labor Hours Definitions

If the awarded contract contains hours for labor related services, the following definitions will apply:

1. "Business Day" Monday through Friday
2. "Business Hours" Standard Business Hours 8 a.m. to 5 p.m.
3. "Regular Time" Work that occurs during standard business hours
4. "Emergency Time" Work that occurs outside standard business hours

#### 4.8. Administrative Fee

For each purchase order processed under an awarded contract, H-GAC will directly invoice the contractor an administrative fee (Order Processing Charge) applicable to the sale of all equipment and services submitted in contractor's response. It is the contractor's responsibility to remit the administrative fee within thirty (30) days of processing any customer's purchase order, even if an invoice is not received from H-GAC. Contractor agrees that H-GAC will have the right, with reasonable notice, to inspect its records pertaining to purchase orders processed and the accuracy of the fees payable to H-GAC. For this solicitation the administrative fee is as follows:

Administrative Fee (per Purchase Order)

<b>Category A</b> – Brush Trucks/Light Rescue	\$1,000 per purchase order
<b>Category B</b> – Aerial Fire Apparatus	\$2,000 per purchase order
<b>Category C</b> – Pumper Fire Apparatus	\$2,000 per purchase order
<b>Category D</b> – Pumper/Tanker and Tanker Apparatus	\$2,000 per purchase order
<b>Category E</b> – ARFF Apparatus	\$2,000 per purchase order
<b>Category F</b> – Special Service Vehicles	
Heavy Rescue*/Special Service	\$2,000 per purchase order
Light Rescue/Quick Response	\$1,000 per purchase order
All Trailers	2% of purchase order
*Heavy Rescue is vehicle with GVWR of 26,000 and above.	
<b>Category G</b> –Fire/Rescue/Emer. Response Boats	2% of purchase order
<b>Category H</b> - Fire Command Vehicles	\$1,000 per purchase order
<b>Category I</b> - Alternative Fuel Vehicles	Fee determined by category of vehicle
<b>Category J</b> –Service/Maintenance Plans	2% per purchase order
<b>Category K</b> - Fire Apparatus/Vehicle Parts and Supplies	2% per purchase order
<b>Category L</b> - Fire Apparatus/Vehicle Options	No separate fee - part of vehicle

#### 4.9. Final Contract Deliverables

Contractor agrees to submit written quarterly reports to H-GAC detailing all transactions during the previous three (3) month period. Reports must include, but are not limited, to the following information:

- Customer Name and address
- HGACBuy confirmation number
- Product/Service purchased
- Customer Purchase Order Number
- Purchase Order Date
- Product/Service dollar amount
- HGACBuy Order Processing Charge amount

Reports must be provided to H-GAC in Excel or other acceptable electronic format by the 30th day of the month following the quarter being reported. If Contractor defaults in providing Products or Services reporting as required by the contract, recourse may be exercised through cancellation of the contract and other legal remedies as appropriate.

--End of section--

**Attachment A**  
**Hughes Fire Equipment, Inc.**  
**Fire Apparatus and Related Vehicles**  
**Contract No.: FS12-23**

<b>Manufacturer</b>	<b>Product</b>	<b>Item Description</b>	<b>Offered List Price</b>	<b>HGACBuy Discount</b>
		Category A - Wildland and Brush		
Pierce	23W-101	1019 Ford F-550 Pumper - 1019	\$ 366,288.00	5%
Pierce	23W - 103 International Type 3	International Wildland-1039	\$ 581,003.00	5%
Pierce	23W - 104 International Urban	International Urban Interface-1040	\$ 491,716.00	5%
BME Fire Trucks	Summit	Navistar, 4x4, 4-Door, Model 34, 1000 GPM Pump, 500 Gallon Water Tank	\$ 544,632.00	5%
BME Fire Trucks	Targhee	Navistar, 4x4, 4-Door, Model 34, 500 GPM Pump, 500 Gallon Water Tank	\$ 529,854.00	5%
BME Fire Trucks	Rocky Mountain	Navistar, 4x4, 4-Door, Type 3, Model 346/500R, 600 Gallon Water Tank, 500 GPM Pump	\$ 455,062.00	5%
BME Fire Trucks	Aspen	Navistar, 4x4, 4-Door, Type 4, 800 Gallon Water Tank, 1.5AGE Pump	\$ 449,583.00	5%
BME Fire Trucks	McCall	Dodge, Type 6, 300 Gallon Water Tank, 1.5AGE Pump	\$ 294,167.00	5%
BME Fire Trucks	Ponderosa	Type 6, 300 Gallon Water Tank, 1.5AGE Pump	\$ 325,057.00	5%
BME Fire Trucks	Sawtooth	Type 6, 300 Gallon Water Tank, 1.5AGE Pump	\$ 329,057.00	5%
BME Fire Trucks	Big Horn	Navistar, 4x4, 4-Door, Wildland Urban Interface, 750 Gallon Water Tank, 1000 GPM Pump	\$ 606,667.00	5%
		Category B - Aerial Fire Apparatus		
Pierce	23A-101	Enforcer Chassis, Single Rear Axle, 75' Aerial - 1027	\$ 1,436,022.00	5%
Pierce	23A-102	Enforcer Chassis, Tandem Rear Axle, PUC, 75' Aerial - 1028	\$ 1,474,688.00	5%
Pierce	23A-103	Velocity Chassis, Tandem Rear Axle, 100' Aerial - 1029	\$ 1,648,105.00	5%
Pierce	23A-104	Enforcer Chassis, Single Rear 107' Aerial -1030	\$ 1,589,837.00	5%
Pierce	23A-105	Enforcer Chassis, Tandem Rear Axle, 107' Aerial - 1031	\$ 1,699,833.00	5%
Pierce	23A-106	Velocity Chassis, Tandem Rear Axle, 105' Aerial - 1032	\$ 1,646,299.00	5%
Pierce	23A-107	Velocity Chassis, Tandem Rear axle, 100' Rear mounted Platform - 1033	\$ 1,912,763.00	5%
Pierce	23A-108	Velocity Chassis, Tandem Rear axle, 100' Aluminum Rear mounted Platform - 1034	\$ 2,017,959.00	5%
Pierce	23A-109	Enforcer Chassis, Tandem Rear axle, mid-mounted 100' platform - 1035	\$ 2,101,962.00	5%
Pierce	23A-110	Enforcer Chassis, 107' Tractor Drawn Aerial - 1036	\$ 2,066,551.00	5%
Pierce	23A-111	Enforcer Snozzle - 1037	\$ 1,314,701.00	5%
		Category C - Pumper Fire Apparatus		
Pierce	23P-102	Freightliner M2-106 Responder, 1000 Tank, 1250 Pump 1020	\$ 397,469.04	5%
Pierce	23P-103	International 4 door 1000 tank, 1250 Pump Pumper 1026	\$ 526,585.97	5%
Pierce	23P-104	Saber Pumper, 750 Tank, 1500 pump 1022	\$ 881,807.87	5%
Pierce	23P-105	Enforcer Pumper 750 tank, 1500 pump 1023	\$ 956,324.96	5%
Pierce	23P-106	Enforcer PUC Pumper 750 tank, 1500 pump 1024	\$ 1,035,341.76	5%
Pierce	23P-107	Velocity Pumper 1025	\$ 967,322.35	5%
Pierce	23P-108	Velocity PUC Pumper 1038	\$ 1,049,384.90	5%
		Category D - Pumper Tanker/Tender		
Pierce	23PT-101	Freightliner 2000 Gallon Tanker - 1041	\$ 511,866.00	5%
Pierce	23PT-102	International 2000 Gallon Tanker -1042	\$ 498,571.00	5%
Pierce	23PT-103	Saber 2000 Gallon Tanker - 1043	\$ 899,378.00	5%

Pierce	23PT-104	Enforcer 2000 Gallon Tanker - 1044	\$ 982,413.00	5%
Pierce	23PT-105	Freightliner 3000 Tandem Tanker - 1045	\$ 507,344.00	5%
Pierce	23PT-106	International 3000 Tandem Tanker - 1046	\$ 520,168.00	5%
Pierce	23PT-107	Saber Tandem 3000 Tanker - 1047	\$ 985,111.00	5%
Pierce	23PT-108	Enforcer Tandem 3000 Tanker - 1048	\$ 1,048,825.00	5%
Pierce	23PT-109	Velocity Tandem PUC 2500 Tanker - 1049	\$ 1,109,887.00	5%
BME Fire Trucks	Tahoe	2000 Gallon Water Tender	\$ 483,632.00	5%
BME Fire Trucks	Cascade	3000 Gallon Water Tender	\$ 552,502.00	5%
BME Fire Trucks	Clearwater	Navistar, 4x4, 4-Door, 1250 Gallon Water Tank, 500 GPM Pump Extreme Water Tender	\$ 533,552.00	5%
BME Fire Trucks	Mammoth	1250 Gallon Extreme Water Tender, Navistar 2-Door Cab	\$ 501,135.00	5%
BME Fire Trucks	Payette	1800 Gallon Tactical Water Tender	\$ 484,061.00	5%
		Category E - ARFF Vehicles		
Oshkosh - Pierce	23AR-101	Oshkosh Striker 4x4, 2-Door, Aluminum Cab, 2 Passenger Seating, Roof Turret (375/750 gpm)	\$ 1,141,252.35	5%
Oshkosh - Pierce	23AR-102	Oshkosh Striker 6x6, 2-Door, Aluminum Cab, 2 Passenger Seating, Roof Turret (600/1200 gpm), bumper Turret (300 gpm), One Handline (Foam/Water), Water Tank Capacity (3000 gal.), Foam Tank Capacity (420 gal.), Fire Pump (Power divider driven Waterous CRQB, Single Stage Centrifugal, 1950 gpm at 250 psi)	\$ 1,217,470.80	5%
Oshkosh - Pierce	23AR-103	Oshkosh Striker 8x8, 2-Door, Aluminum Cab, 2 Passenger Seating, Roof Turret (600/1200 gpm), bumper Turret (300 gpm), One Handline (Foam/Water), Water Tank Capacity (4500 gal.), Foam Tank Capacity (420 gal.), Fire Pump (Power divider driven Waterous CRQA, Single Stage Centrifugal, 1950 gpm at 240 psi)	\$ 1,784,346.90	5%
Oshkosh - Pierce	23AR-104	Oshkosh New Generation Volterra Striker 6X6, 2-Door, Aluminum Cab, 2 Passenger Seating, Roof Turret (600/1200 gpm), bumper Turret (300 gpm), One Handline (Foam/Water), Water Tank Capacity (4500 gal.), Foam Tank Capacity (420 gal.), Fire Pump (Waterous CRQB, Single Stage Centrifugal, 1950 gpm at 250 psi), dual engine driveline	\$ 2,390,151.75	5%
Oshkosh - Pierce	23AR-HS	H-Series Chassis; 2-Door, Aluminum Cab, 2 Passenger Seating, 50,000 GVWR, Single Axle	\$ 713,119.00	5%
Oshkosh - Pierce	23AR-HTA	HT-Series Chassis; 2-Door, Aluminum Cab, 2 Passenger Seating, 55,000 GVWR, Single Axle	\$ 624,947.00	5%
		Category F - Special Service Vehicles Vehicles		
Pierce	23SS - 101	Ford F-550 Rescue 12' -1050	\$ 278,709.00	5%
Pierce	23SS - 102	Enforcer NWI-Rescue - 1051	\$ 975,772.00	5%
Pierce	23SS - 103	Velocity NWI-Rescue - 1052	\$ 999,751.00	5%
Pierce	23SS - 104	Enforcer PUC NWI-Rescue - 1053	\$ 1,252,488.00	5%
Pierce	23SS - 105	Velocity Combo-Rescue - 1054	\$ 1,136,418.00	5%
Pierce	23SS - 106	Enforcer Tandem Combo - 1055	\$ 1,114,686.00	5%
Pierce	23SS - 107	Velocity Alum Walk-in Rescue - 1056	\$ 1,114,461.00	5%
Pierce	23SS - 108	Enforcer Stainless NWI-Rescue - 1057	\$ 1,020,660.00	5%
Pierce	23SS - 109	Enforcer Walk-in - 1058	\$ 1,034,340.00	5%
Pierce	23SS - 110	Velocity Tandem Walk-in - 1059	\$ 1,228,431.00	5%
Frontline Communications	C-17	Mobile Command Unit, Chevrolet Suburban, 4x4, 17 feet overall length, Single axle, Gasoline	\$ 196,178.00	5%
Frontline Communications	C-20	Rapid Response Command Unit, Ford Transit-350 Van, 2WD, 20 feet overall length, Single axle, Gasoline	\$ 278,319.00	5%
Frontline Communications	CRU-22	Critical Response Command Unit, Ford Transit-350 High Roof Van, 2WD, 9,500 GVWR, 22 feet overall length, Single axle, Gasoline	\$ 353,163.00	5%
Frontline Communications	C-23	Mobile Command Unit, Mercedes-Benz Sprinter 3500, 23 feet overall length, 2WD, Single axle, Diesel	\$ 306,919.00	5%
Frontline Communications	C-25	Mobile Command Unit, Ford F-650 with custom aluminum body, 26,000 GVWR, 25 feet overall length, 2WD, Single axle, Diesel	\$ 477,451.00	5%

Frontline Communications	C-30	Mobile Command Unit, Freightliner M2-106 with custom aluminum body, 33,000 GVWR, 30 feet overall length, 2WD, Single axle, Diesel	\$ 587,098.00	5%
Frontline Communications	C-35	Mobile Command Unit, Freightliner M2-106 with custom aluminum body, 33,000 GVWR, 35 feet overall length, 2WD, Single axle, Diesel	\$ 669,849.00	5%
Frontline Communications	C-40	Mobile Command Unit, Freightliner M2-106 with custom aluminum body, 54,000 GVWR, 40 feet 9 inches overall length, 2WD, Dual axle, Diesel	\$ 735,953.00	5%
Frontline Communications	C-40 Enforcer	Mobile Command Unit, Pierce Enforcer custom chassis with custom aluminum body, 40 feet 9 inches overall length, 2WD, Dual axle, Diesel	\$ 1,546,944.00	5%
Frontline Communications	C-40 Saber	Mobile Command Unit, Pierce Saber custom chassis with custom aluminum body, 40 feet 9 inches overall length, 2WD, Dual axle, Diesel	\$ 1,017,416.00	5%
Frontline Communications	C-40 Velocity	Mobile Command Unit, Pierce Velocity custom chassis with custom aluminum body, 40 feet 9 inches overall length, 2WD, Dual axle, Diesel	\$ 1,259,403.00	5%
Frontline Communications	C-28T	Mobile Command Trailer - Custom aluminum body, 28 feet overall length, Dual axle	\$ 308,961.00	5%
Frontline Communications	C-35T	Mobile Command Trailer - Custom aluminum "gooseneck" body, 35 feet overall length, Dual axle	\$ 394,976.00	5%
Frontline Communications	C-53T	Mobile Command Trailer - Custom aluminum body, 53 feet overall length, Dual axle	\$ 1,241,546.00	5%
Frontline Communications	C-RTR	Refurb/Technology Refresh Command Vehicle - Customer-furnished vehicle, refurbish interior and/or exterior, upgrade technology	\$ 292,975.00	5%
BME Fire Trucks	Sequoia	10 Man Crew Carrier Vehicle	\$ 378,634.00	5%
		Category J - Service/Maintenance Plans		
Oshkosh	ARFF Warranty	Multiple plans available by model - see Siddons-Martin Warranty/Service Table		
Frontline Communications	Vehicle Warranty	Multiple plans available by model - see Siddons-Martin Warranty/Service Table		
BME	Vehicle Warranty	Multiple plans available by model - see Siddons-Martin Warranty/Service Table		
Pierce Manufacturing	Vehicle Warranty	Multiple plans available by model - see Siddons-Martin Warranty/Service Table		



**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Brandi Suda, Finance Director  
**Co-Submitter:** Heidi Derryberry  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



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**TITLE:**

**Consideration and Adoption of Ordinance No. 2024-17:** An ordinance levying upon the assessed valuation of the property within the City of Flagstaff, Arizona, subject to taxation a certain sum upon each one hundred dollars (\$100.00) of valuation sufficient to raise the amount estimated to be required in the annual budget, less the amount estimated to be received from other sources of revenue; providing funds for various bond redemptions, for the purpose of paying interest upon bonded indebtedness and providing funds for general municipal expenses, all for the Fiscal Year ending the 30th day of June 2025. **(Primary and secondary property tax levies for FY 2024-2025)**

**STAFF RECOMMENDED ACTION:**

1. Read Ordinance No. 2024-17 by title only for the final time
2. City Clerk reads Ordinance No. 2024-17 by title only (if approved above)
3. Adopt Ordinance No. 2024-17

**Executive Summary:**

The City Council is required to fix and levy the amount to be raised from property taxation after the adoption of the final budget, per A.R.S. Section 42-17151. The final budget is anticipated to be adopted on June 18, 2024.

**Financial Impact:**

The City is proposing a flat primary property tax levy of \$7,159,207 on existing properties, plus a levy of \$71,670 on new construction, for a total primary property tax levy in Fiscal Year (FY) 2024-2025 of \$7,230,877. The primary property tax rate to support this levy is 0.6363 per \$100 of assessed valuation (lower than the prior fiscal year). The proposed levy is less than the maximum allowable primary property tax levy allowed for FY 2024-2025, which is \$7,983,170.

The City is proposing a secondary property tax levy of \$9,001,046 on existing properties, plus a levy of \$90,108 on new construction, for a total secondary property tax levy in FY 2023-2024 of \$9,091,154. The proposed secondary property tax rate is 0.8000 per \$100 of net assessed valuation (same as the prior fiscal year).

**Policy Impact:**

Adoption of the proposed property tax levies will generate revenues to help fund the community needs as identified in the FY 2024-2025 Final Budget and policies reflected therein.

**Previous Council Decision or Community Discussion:**

- December Council Retreat on December 14, 2023
- February Budget Retreat on February 1, 2024 and February 2, 2024
- March Capital Improvement Budget Retreat on March 28, 2024

- Council Budget Retreat on April 25, 2024 and April 26, 2024
- Tentative Budget Adoption on June 4, 2024

**Options and Alternatives to Recommended Action:**

- 1) Adopt the primary and secondary property tax rates as proposed.
- 2) Adopt lower primary and secondary property tax rates than proposed.
- 3) Adopt higher tax rates than proposed, however, this action may be barred by Truth in Taxation Notice publication deadlines or other legal considerations.

**Background and History:**

Primary property tax revenues may be used for all purposes. Primary property tax levies are limited, per A.R.S. Section 42-17051. The City has the ability to increase the amount received from the primary property tax levy by a maximum of 2% each year excluding new construction. The maximum allowable increase for FY 2024-2025 is 10.0%. FY 2024-2025 proposed primary property tax levy is set at \$7,230,877, which is less than the maximum allowable levy of \$7,983,170.

Primary property tax levies are also subject to "Truth in Taxation" notice and hearing requirements, per A.R.S. Section 42-17107. On or before February 10 of each year, the county assessor must transmit to each city and town an estimate of the total net assessed valuation of the city, including new property added to the tax roll. If the proposed primary tax levy amount, excluding amounts attributable to new construction, is greater than the levy amount in the previous year, the city must follow the "Truth in Taxation" procedures. It is important to note that it is the levy amount and not the rate which triggers the "Truth in Taxation" procedures. The proposed FY2024-2025 primary tax levy amount did not trigger the "Truth in Taxation" procedures.

The City is budgeting primary property tax revenues of \$7,146,000 in its FY 2024-2025 Budget. This budgeted amount is less than the levy amount because the City is allowing for approximately 1.0% in bad debt (taxes not able to be collected). The City anticipates an overall 0.7% increase in primary property tax revenues in FY 2024-2025, due to the increase from new construction (properties added to tax roll). Primary property tax revenues may be used for any general purpose use of the City government.

Secondary property tax revenues may only be used by cities and towns to retire the principal and interest or redemption charges on general obligation bonds issued to pay for capital projects. Secondary property tax levies are not limited. The City has budgeted a total of \$9,091,154 in FY 2024-2025 secondary property tax, an approximate 5.3% increase over the FY 2023-2024 budget (\$8,633,802). The increase is directly related to the increased assessed valuation (increase in property values) and new construction. Secondary property tax revenues are used to pay general obligation debt issued for City capital projects. Five years of historical data is shown below:

Property Tax Rates	FY 2020-2021	FY 2021-2022	FY 2022-2023	FY 2023-2024	FY 2024-2025 Proposed
Primary	0.7510	0.7186	0.6954	0.6634	0.6363
Secondary	0.8000	0.8000	0.8000	0.8000	0.8000
Total	1.5510	1.5186	1.4954	1.4634	1.4363

Primary property taxes account for 7.9% of the General Fund revenues budgeted for FY 2024-2025. The adoption of the property tax levy is the final step in the entire budget approval process.

**Connection to PBB Priorities and Objectives:**

The adoption of the Annual Budget and Financial Plan provides direction and financial resources to support the Key Community Priorities and Objectives. The property tax adoption is part of the overall City budget adoption.

**Connection to Regional Plan:**

None

**Connection to Carbon Neutrality Plan:**

None

**Connection to 10-Year Housing Plan:**

None.

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**Attachments:**    [Ord. 2024-17](#)

**ORDINANCE NO. 2024-17**

**AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF FLAGSTAFF, LEVYING UPON THE ASSESSED VALUATION OF THE PROPERTY WITHIN THE CITY OF FLAGSTAFF, ARIZONA, SUBJECT TO TAXATION A CERTAIN SUM UPON EACH ONE HUNDRED DOLLARS (\$100.00) OF VALUATION SUFFICIENT TO RAISE THE AMOUNT ESTIMATED TO BE REQUIRED IN THE ANNUAL BUDGET, LESS THE AMOUNT ESTIMATED TO BE RECEIVED FROM OTHER SOURCES OF REVENUE; PROVIDING FUNDS FOR VARIOUS BOND REDEMPTIONS, FOR THE PURPOSE OF PAYING INTEREST UPON BONDED INDEBTEDNESS AND PROVIDING FUNDS FOR GENERAL MUNICIPAL EXPENSES, ALL FOR THE FISCAL YEAR ENDING THE 30TH DAY OF JUNE, 2025**

**RECITALS:**

WHEREAS, by the provisions of State law, the ordinance levying taxes for fiscal year 2024-2025 is required to be finally adopted not later than the third Monday in August; and

WHEREAS, the County of Coconino is the assessing and collecting authority for the City of Flagstaff.

**ENACTMENTS:**

**NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF FLAGSTAFF AS FOLLOWS:**

SECTION 1. There is hereby levied on each one hundred dollars (\$100.00) of the assessed value of all property, both real and personal within the corporate limits of the City of Flagstaff, except such property as may be by law exempt from taxation, a primary property tax rate of 0.6363 for the fiscal year ending on the 30th day of June 2025. If this tax rate exceeds the maximum levy allowed by law, the Board of Supervisors of the County of Coconino is hereby authorized to reduce the levy to the maximum allowable by law after providing notice to the City.

SECTION 2. In addition to the rate set in Section 1 hereof, there is hereby levied on each one hundred dollars (\$100.00) of the assessed value of all property, both real and personal within the corporate limits of the City of Flagstaff, except such property as may be by law exempt from taxation, a secondary property tax rate of 0.8000 for the fiscal year ending June 30, 2025.

SECTION 3. Failure by the county officials of Coconino County, Arizona, to properly return the delinquent list, any irregularity in assessments or omissions in the same, or any irregularity in any proceedings shall not invalidate such proceedings or invalidate any title conveyed by any tax deed; failure or neglect of any officer or officers to timely perform any of the duties assigned to him or to them shall not invalidate any proceedings or any deed or sale pursuant thereto, the validity of the assessment or levy of taxes or of the judgment of sale by which the collection of the same may be enforced shall not affect the lien of the City of Flagstaff upon such property for the delinquent taxes unpaid thereon; overcharge as to part of the taxes or of costs shall not invalidate any proceedings for the collection of taxes or the foreclosure of the lien thereon or a sale of the

property under such foreclosure; and all acts of officers de facto shall be valid as if performed by officers de jure.

SECTION 4. All ordinances and parts of ordinances in conflict herewith are hereby repealed.

SECTION 5. That the Clerk is hereby directed to transmit a certified copy of this ordinance to the County Assessor and the Board of Supervisors of the County of Coconino, Arizona.

SECTION 6. Effective Date. The tax levies imposed by this Ordinance shall take effect August 2, 2024.

PASSED AND ADOPTED by the City Council of the City of Flagstaff this 2nd day of July, 2024.

\_\_\_\_\_  
MAYOR

ATTEST:

\_\_\_\_\_  
CITY CLERK

APPROVED AS TO FORM:

\_\_\_\_\_  
CITY ATTORNEY

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Erin Young, Water Resources Manager  
**Co-Submitter:** Shannon Jones, Water Services Director  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



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**TITLE:**

**Consideration and Adoption of Resolution No. 2024-30 and Ordinance No. 2024-19:** A Resolution of the Flagstaff City Council declaring as a public record that certain document filed with the City Clerk and entitled "*Water Services Rates Code Changes*" and An Ordinance of the City Council of the City of Flagstaff, amending the Flagstaff City Code Title 3, Business Regulations, Section 3-10-001-0008 License Fees and Title 7, Health and Sanitation, Chapter 7-02 Wastewater Regulations, and Chapter 7-03 Water Regulations, by adopting by reference that certain document entitled "*Water Services Rates Code Changes*"; providing for penalties, repeal of conflicting ordinances, severability, and establishing an effective date

**STAFF RECOMMENDED ACTION:**

1. Adopt Resolution No. 2024-30
2. Read Ordinance No. 2024-19 by title only for the final time
3. City Clerk reads Ordinance No. 2024-19 by title only (if approved above)
4. Adopt Ordinance No. 2024-19

**Executive Summary:**

This action adopts an ordinance increasing water, sewer, and reclaimed water user and service fees, and water and sewer capacity fees. The charges are increased over five years to adequately fund operations, maintenance, debt repayment, and replacement projects contained in the ten-year capital improvement program per Council direction.

**Financial Impact:**

Water, wastewater, and reclaimed water utility rates and fees and water and wastewater capacity charges will be phased in over a 5-year period. The new rates for Year 1 would take effect on September 1, 2024:

- Year 1: September 1, 2024 through December 31, 2025
- Year 2: January 1, 2026 through December 31, 2026
- Year 3: January 1, 2027 through December 31, 2027
- Year 4: January 1, 2028 through December 31, 2028
- Year 5: January 1, 2029 through December 31, 2029

**Policy Impact:**

The City is proposing modifications to the water, wastewater, and reclaimed water rates and rate structures, increasing water and sewer capacity fees, and increasing miscellaneous water charges, to meet cost recovery requirements for services provided to specific customers. The impact on the combined utility bill for water and wastewater service was carefully considered in determining the appropriate balance between the proposed rate changes and debt financing. Based on the ten-year financial plans, a synopsis of cost impacts is explained below:

**Water**

The water enterprise fund is impacted by multiple cost factors over the five-year planning period including:

- Operating cost increases for treatment chemicals due to scarcity and supply challenges.
- Operating cost increases for contractual services necessary for treating raw water.
- Increasing costs for replacing and repairing aging infrastructure.
- Surface water treatment plant upgrades to improve water source resiliency and maintain water quality.
- Increasing costs required for drought preparedness through watershed health.
- Additional operations and trades staff to support a growing community, and capital improvement program development.
- Operating cost increases for personnel services and benefits.
- Adjustments to water capacity fees and revenues to align fee per single family equivalent (3/4-inch meter equivalent) with current level of service requirements, growth-related shares of past infrastructure investments and planned capital improvements, and preparations for sustainable future water supplies.
- While Water Services proposed to decrease the base fee from 29% cost recovery to 25% cost recovery, the overall increases to base fees are proposed to better reflect the recovery of fixed operating costs.
- Increases to commodity rates are proposed to generate sufficient revenues to maintain the water fund as a self-sustaining enterprise, encourage efficient water use and urge conservation.
- Condensing the Institutional customer class to the Commercial customer class to remove single-user categories from the customer class list.
- Additionally, the ratios between water rate tiers are being adjusted to provide price incentives for efficiency indoors and re-setting the cost-of-service of providing water for outdoor water uses.

### **Wastewater**

The wastewater enterprise fund is impacted by multiple cost factors over the five-year planning period including:

- Operating cost increases for treatment chemicals due to scarcity and supply challenges.
- Increasing cost for replacing and repairing aging infrastructure.
- Maintenance cost increases of system infrastructure due to deferred maintenance due to a lack of funding and increased system demand.
- Operating cost increases for personnel services and benefits.
- The introduction of base fees are proposed to reflect the recovery of fixed operating costs and adjusted for the cost-of-service to each customer class.
- Adjustment to the wastewater capacity fees and revenues to align the fee per single family equivalent (3/4-inch meter equivalent) with current level of service requirements including solids treatment capacity, growth-related shares of past infrastructure investments and planned capital improvements, and preparations for future wastewater treatment expansions.
- Adjustments to volumetric rates are proposed to reflect the cost of wastewater loadings by customer class and generate sufficient revenues to maintain the wastewater fund as a self-sustaining enterprise.

Overall, from FY 2025 through FY 2029, the water, wastewater, and reclaimed water base fee and volumetric rate changes are forecasted to generate an increase in average annual revenue of up to \$1.7 million or 9.4% in the water fund, \$1.7 million or 12.5% in the wastewater fund, and \$102,000 or 8.1% in the reclaimed water fund and become effective September 1, 2024. Details of the increase are provided in a written report with data supporting the changes on file with the City Clerk and posted to Flagstaff's Rate Study webpage at [www.cleanwaterflagstaff.com](http://www.cleanwaterflagstaff.com).

### **Water and Wastewater Miscellaneous Charges**

To address cost recovery, to meet the City's financial policy that charges recover all direct and indirect costs of service, miscellaneous charges are assessed to specific users of the service so that general rate payers do not bear the burden.

### **Previous Council Decision or Community Discussion:**

On April 16, 2024 Council adopted a Notice of intention to increase water, sewer, and reclaimed water rates or rate components, fees, or service charges

Water Services has presented on various elements of the rate study to City Council beginning February 2023. The videos of these meetings are available on the City's Rate Study website [cleanwaterflagstaff.com](http://cleanwaterflagstaff.com) from the "View Past Meetings" tab. Here is a list of all meetings where staff presented to City Council on the Rate

## Study:

- February 21, 2023 Discussion regarding a rate and fee study for water, reclaimed water, and wastewater funds.
- March 7, 2023 Consideration of a Contract for Professional Services with Stantec Consulting Services, Inc
- September 5, 2023 Introduction of the Rate Study Team
- December 12, 2023 Water, Wastewater, and Reclaimed Water Rate Study Presentation 1 of 2 on Capacity Fees and Misc. Fees
- January 23, 2024 Water, Wastewater, and Reclaimed Water Rate Study Presentation 2 of 3 on Capacity Fees and Misc. Fees
- February 6, 2024 Water, Wastewater, and Reclaimed Water Rate Study Presentation 3 of 3 on Capacity Fees and Misc. Fees
- February 13, 2024 Introduction to Water, Wastewater, Reclaimed Water Rate Design
- April 2, 2024 Follow-up discussion from the March 25, 2024 City Council - Water Commission Joint Meeting
- April 16, 2024 Notice of intention to increase water, sewer, and reclaimed water rates or rate components, fees, or service charges
- May 16, 2024 Council special worksession; presentation from Water Services Director on the operational needs of the Division
- May 21, 2024 Presentation from Stantec on Financial Model Assumptions; Direction from Council on changes to assumptions
- June 4, 2024 Staff presentation on the results of Council's Direction; Council directed staff to proceed with changes for the June 18 Public Hearing

Joint meetings of the Flagstaff City Council and Water Commission were held on the following dates. The videos of these meetings are available on the City's Rate Study website [cleanwaterflagstaff.com](http://cleanwaterflagstaff.com) from the "View Past Meetings" tab.

- October 23, 2023 Discussion and Direction on the Rate Study Financial Plans
- March 4, 2024 Wastewater Rate Design Workshop & Direction on Rate Design
- March 25, 2024 Water & Reclaimed Water Rate Design Workshop & Direction on Rate Design

Presentations were provided to the Water Commission about the Rate Study on the following dates. The videos of these meetings are available on the City's Rate Study website [cleanwaterflagstaff.com](http://cleanwaterflagstaff.com) from the "View Past Meetings" tab.

- August 7, 2023 Introduction of Stantec Team
- September 21, 2023 Rate Study Update on Task 2
- October 19, 2023 Rate Study Financial Planning Scenarios Presentation and Discussion
- November 16, 2023 Rate Study Approach for Capacity Fee Calculations, Cost Allocations, Misc. Fees
- December 14, 2023 Update on Capacity Fee Calculations, Cost Allocations, Misc. Fees
- January 18, 2024 Water, Wastewater, and Reclaimed Water Rate Study Presentation on Capacity Fees and Misc. Fees
- February 15, 2024 Rate Design Discussions with Water Commission
- March 21, 2024 Brief update from staff with questions for commissioners
- April 18, 2024 Stantec provided the same presentation given to Council on April 16

## Community Meetings

- Water Services held a Water Rate Study Informational Meeting on December 7, 2023. This was a public information meeting available as a dial-in (spanish or english) or WebEx. Video is available on [cleanwaterflagstaff.gov](http://cleanwaterflagstaff.gov)
- Water Services held a drop-in meeting on Capacity Fees at its Administrative Offices on January 30 & 31
- Water Services tabled at the Downtown Community Library on April 1 from 5-7 pm; Jay Lively Ice Arena on April 3 from 5-7 pm
- Water Services tabled at Science Saturday at Willow Bend on April 6, Joe Montoya on April 10 from 10-noon
- Water Services held a drop-in event at the East Flagstaff Community Library on April 8, 2024 from 5:30 to 7:00 pm

- Water Services provided information on the rate study and held a tour at the Rio de Flag Water Reclamation Plant on April 13, 2024 at 10 am
- Water Services tabled at Earth Day on April 20th from 11 am to 2 pm
- Water Services were invited to introduce the rate study before a hike at Schultz Creek with Friends of the Rio de Flag on May 2 at 5 pm
- Water Services tabled for the rate study during the Arizona Department of Environmental Quality community event on wastewater systems at the East Flagstaff Library on May 8, 2024 from 5:30 to 7 pm
- Water Services held a drop-in event at the Aquaplex on May 18, 2024 from 11 am to 2 pm

Meetings to discuss various components of the Rate Study have been held with individual customers and community groups including the Greater Flagstaff Chamber of Commerce, Capstone Homes, Northern Arizona University, Snowbowl, a member of the Downtown Business Alliance, Historic Brewery, Joy Cone. Community "Roundtable" type discussions were held in September 2023. Staff also presented to the Economic Collaborative of Northern Arizona, Friends of Flagstaff's Future, and the City's Tourism Commission (April 25), Airport Commission (May 9), and Housing Commission (May 23). The community groups comprised representatives of the City of Flagstaff's commissions.

The City released a website for rate study information in October, 2023 at [cleanwaterflagstaff.com](http://cleanwaterflagstaff.com). Between October and April, the website had over 2,800 views. The site had 2,966 views in April, and 4,188 views in May. A Water Rate Calculator was added to the site on April 16 and video on how to use the calculator is available on the website, released on May 24. Customers can leave comments from the website.

Water Services has emailed out notices throughout the study to multiple lists of customers and organizations, sharing information about Council or Commission meetings, and community meetings, to customers monthly. The City's Public Information Office issued press releases related to the rate study, on October 16, 2023, December 12, 2023, February 29, 2024, and March 28, 2024. A notice of the June 18 and July 2 public hearing dates are scheduled for the Daily Sun.

#### **Options and Alternatives to Recommended Action:**

Council may elect to change elements of the rate study. Doing so would result in a time and dollar increase change order on the contract with Stantec and delay the public hearing process.

#### **Connection to PBB Priorities and Objectives:**

Serve the public by providing high-quality customer service  
 Deliver outstanding services to residents through a healthy, well-maintained infrastructure system  
 Support and strengthen a robust, diverse, and sustainable economy  
 Promote, protect, and enhance a healthy, sustainable environment and its natural resources

#### **Connection to Regional Plan:**

Goal WR.2. Manage a coordinated system of water, wastewater, and reclaimed water utility service facilities and resources at the City level and identify funding to pay for new resources.  
 Goal WR.4. Logically enhance and extend the City's public water, wastewater, and reclaimed water services including their treatment, distribution, and collection systems in both urbanized and newly developed areas of the City to provide efficient delivery of services.

#### **Connection to Carbon Neutrality Plan:**

CR-2 Strengthen existing community systems to create resilience to both short-term shocks and long-term change.  
 WS-1 Improve water infrastructure and expand water reuse.  
 HS-3 Adequately fund services for disaster preparedness.  
 HS-4 Improve the resilience of public infrastructure and City facilities.

#### **Connection to 10-Year Housing Plan:**

None

#### **Connection to Division Specific Plan:**

Council-adopted Water Policies (Utilities Integrated Master Plan 2014)

Section A Finance Policies:

Policy A1.1, A1.2

Policy A3.1, A3.2, A3.3

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**Attachments:**    Res. 2024-30  
                          Water Services Rates Code Changes  
                          Ord. 2024-19

**RESOLUTION NO. 2024-30**

**A RESOLUTION OF THE FLAGSTAFF CITY COUNCIL DECLARING AS A PUBLIC RECORD THAT CERTAIN DOCUMENT FILED WITH THE CITY CLERK AND ENTITLED “*WATER SERVICES RATES CODE CHANGES*”**

**RECITALS:**

WHEREAS, pursuant to A.R.S. § 9-802 a municipality may enact or amend provisions of the City Code by reference to a public record, provided that the adopting ordinance is published in full; and

WHEREAS, ARS §§9-511, 9-511.01 et. seq. provides authority for municipalities to adjust water, wastewater, and reclaimed water utility rates and fees, and water and wastewater capacity charges, and

WHEREAS, amending water, wastewater, and reclaimed fees and rates and fees require adoption of City Code changes by Ordinance, and

WHEREAS, City Code changes required are being provided in a document known as “*Water Services Rates Code Changes*”.

**ENACTMENTS:**

**NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF FLAGSTAFF AS FOLLOWS:**

SECTION 1. In General.

That certain document known as “*Water Services Rates Code Changes*” attached hereto as Exhibit A is hereby declared to be a public record, and one (1) paper copy and one (1) electronic copy maintained in compliance with A.R.S. § 44-7041 shall remain on file with the City Clerk and kept available for public use and inspection.

PASSED AND ADOPTED by the City Council of the City of Flagstaff this 2nd day of July, 2024.

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MAYOR

ATTEST:

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CITY CLERK

APPROVED AS TO FORM:

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CITY ATTORNEY

Exhibits:

Water Services Rates Code Changes

## WATER SERVICES RATES CODE CHANGES

### PART 1: LICENSE FEE SECTION

#### **3-10-001-0008 License Fees**

The user fees of the Management Services Division shall be as follows:

Fee Type	Fee per Each
Business license – annual	\$8
Business license – renewal	\$8
Business license – penalty failure to obtain/renew	50% of fee
Transient merchant approval	\$0
Transaction privilege and use tax license (see Section 3-05-003-0320)	
Commercial ground transportation – per taxi	\$38
Commercial ground transportation – per motor coach	\$38
Commercial ground transportation – annual renew	\$8
Adult oriented business (see Section 3-08-001-0006)	
Adult oriented business renew (see Section 3-08-001-0006)	
Scavenger waste permit	<del>\$45</del> \$24
Short-term rental license – annual (see Chapter 3-12)	\$175*

\* Short-term rental license fee will increase by five dollars (\$5.00) annually on November 1st, commencing in 2024.

PART 2: WASTEWATER REGULATIONS

**CHAPTER 7-02  
WASTEWATER REGULATIONS**

SECTIONS:

- 7-02-001-0001 PURPOSE
- 7-02-001-0002 DEFINITIONS
- 7-02-001-0003 INTERFERENCE WITH THE WATER SERVICES DIVISION; DIGGING UP STREETS WITHOUT A PERMIT; TAMPERING WITH EQUIPMENT PROHIBITED
- 7-02-001-0004 RESPONSIBILITY FOR CLEANING, REPAIR AND REPLACEMENT OF BUILDING SEWERS AND CONNECTIONS
- 7-02-001-0005 UNSANITARY DISPOSAL OF EXCREMENT PROHIBITED
- 7-02-001-0006 TREATMENT OF POLLUTED WASTES REQUIRED
- 7-02-001-0007 PROHIBITED SUBSTANCES
- 7-02-001-0008 STANDARDS FOR DISCHARGE
- 7-02-001-0009 INDUSTRIAL CLASSIFICATION
- 7-02-001-0010 INDUSTRIAL SELF-MONITORING
- 7-02-001-0011 REPORTING REQUIREMENTS
- 7-02-001-0012 SIGNATORY REQUIREMENTS
- 7-02-001-0013 CONFIDENTIALITY OF BUSINESS INFORMATION
- 7-02-001-0014 INTERCEPTORS; TYPE, CAPACITY, LOCATION, MAINTENANCE
- 7-02-001-0015 CONTROL MANHOLES
- 7-02-001-0016 INSPECTIONS AND MONITORING
- 7-02-001-0017 PROVISION OF FALSE INFORMATION
- 7-02-001-0018 PUBLIC NOTIFICATION, DEFINITION OF SIGNIFICANT VIOLATION
- 7-02-001-0019 ENFORCEMENT
- 7-02-001-0020 UPSET AN AFFIRMATIVE DEFENSE
- 7-02-001-0021 SUSPENSION OF WATER AND/OR SEWER SERVICE
- 7-02-001-0022 DISREGARD OF SAMPLES
- 7-02-001-0023 CREDIT FOR PRETREATMENT EXPENDITURES
- 7-02-001-0024 PUBLIC RECLAIMED WASTEWATER PIPELINE AND SEWER EXTENSIONS; APPROVAL BY CITY ENGINEER
- 7-02-001-0025 CONSTRUCTION AND OWNERSHIP OF PUBLIC RECLAIMED WASTEWATER PIPELINES, PUBLIC SEWER LINES AND OTHER EQUIPMENT MAINTAINED BY DIVISION
- 7-02-001-0026 PUBLIC RECLAIMED WATER PIPELINE EXTENSION AND CONVERSION POLICY FOR REUSERS
- 7-02-001-0027 MAIN SEWER EXTENSION POLICY FOR AREAS BEYOND PRESENT CITY TRUNK LINES
- 7-02-001-0028 PRIVATE SEWERAGE SYSTEMS; CONSTRUCTION AND MAINTENANCE WITHIN THE CITY PROHIBITED GENERALLY
- 7-02-001-0029 PRIVATE SEWERAGE SYSTEMS; WHEN PERMITTED, TO BE CONSTRUCTED AND MAINTAINED IN SANITARY MANNER
- 7-02-001-0030 PRIVATE SEWERAGE SYSTEMS; DISCONTINUANCE
- 7-02-001-0031 PRIVATE SEWERAGE SYSTEMS; AUTHORITY OF DIRECTOR OF HEALTH DEPARTMENT
- 7-02-001-0032 PERMIT REQUIRED

- 7-02-001-0033 APPLICATION FOR BUILDING CONNECTION
- 7-02-001-0034 DIRECTOR TO APPROVE DESIGN NUMBER, LOCATION, SIZE AND CONSTRUCTION OF BUILDING CONNECTIONS
- 7-02-001-0035 SPECIAL PROVISIONS FOR INSTALLING BUILDING CONNECTIONS IN NEW SUBDIVISIONS AND DEVELOPMENTS
- 7-02-001-0036 RECORDS TO BE KEPT BY COMMUNITY DEVELOPMENT
- 7-02-001-0037 SEWER TAP FEE
- 7-02-001-0038 SEWER USER CHARGES
- 7-02-001-0039 THE COLLECTION OF USERS CHARGES SHALL BE UNDER THE DIRECTION OF THE CITY'S ~~FINANCE~~ MANAGEMENT SERVICES DIRECTOR
- 7-02-001-0040 RATE ESTABLISHMENT AND REVIEW PROCEDURE
- 7-02-001-0041 SEWER USE CHARGES, CAPACITY CHARGES
- 7-02-001-0042 SCAVENGER WASTE AND GREASE HAULERS
- 7-02-001-0042.1 SCAVENGER WASTE DISCHARGE PERMITS
- 7-02-001-0043 SEWER RATES TO BE ADDED TO WATER BILLS
- 7-02-001-0044 WHEN BILLS PAYABLE; DISCONNECTION OF SERVICE FOR FAILURE TO PAY; RECONNECTION FEE
- 7-02-001-0045 DETERMINATION OF WASTEWATER QUANTITY AND BILLINGS: NONRESIDENTIAL
- 7-02-001-0046 PAYMENT OF BILLS AND CHARGES
- 7-02-001-0047 NOTICE PRIOR TO DISCONNECT
- 7-02-001-0048 SERVICE CONNECTIONS
- 7-02-001-0049 PERMITS REQUIRED FOR INDUSTRIAL USERS
- 7-02-001-0050 INDUSTRIAL USER PERMITS
- 7-02-001-0051 PERMITTEE REQUIREMENTS
- 7-02-001-0052 SEWER SERVICE OUTSIDE CITY LIMITS
- 7-02-001-0053 DISCONNECTION OF SERVICE

**7-02-001-0001 PURPOSE**

A. City Water Treatment Facilities. City water treatment facilities include the Lake Mary Water Treatment Plant, NORTH RESERVOIR TREATMENT PLANT, Rio de Flag Water Reclamation Plant (WRP), and the Wildcat HILL WRP. The Water Services Director has authority over all field operations of the City's water treatment and collection system, including flow test measurements, quality of waste, service connections, line construction plus the operation and maintenance of all water facilities.

B. The purpose of this chapter is to establish uniform requirements for users of the publicly owned treatment works (POTW) for the City of Flagstaff, Arizona ("City"), and enable the City to comply with all applicable State and Federal laws, A.R.S. Section 49-391, relating to local enforcement of water pretreatment requirements, the Clean Water Act ("CWA") (33 U.S.C. §§ 1251 et seq.) and the general pretreatment regulations (40 CFR Part 403). The objectives of these wastewater regulations are:

1. To prevent the introduction of pollutants into the POTW that will interfere with their operation;
2. To prevent the introduction of pollutants into the POTW that will pass through the POTW without adequate treatment, into receiving waters, or that will otherwise be incompatible with the POTW;

3. To protect the POTW personnel who may be affected by wastewater and sludge in the course of their employment and to protect the general public;
4. To promote reuse and recycling of effluent and sludge from the POTW;
5. To provide for fees for the equitable distribution of the cost of operation, maintenance, and improvement of the POTW;
6. To enable the City to comply with its Arizona pollutant discharge elimination system permit conditions, its sludge use and disposal requirements, and any other Federal or State laws to which the City's POTW is, or may become, subject. These wastewater regulations shall apply to all users of the City's POTW, and shall authorize the issuance of wastewater discharge permits; provide for effective monitoring, compliance, and enforcement procedures; establish administrative review procedures; establish user monitoring and reporting requirements; provide for the setting of fee rates and surcharges for the equitable distribution of costs resulting from the proper maintenance and operation of the City's POTW; and provide for the assessment of civil and criminal penalties for wastewater regulation violations.

C. The rules and regulations of this chapter are made for the benefit of the users of the City sewer system, for the protection of the sewer system, and to protect the quality of the effluent of the ~~sewage treatment~~ WATER RECLAMATION plants.

#### **7-02-001-0002 DEFINITIONS**

The general definitions found in Section 7-01 (Water Services) shall apply to this chapter. In addition, for the purposes of this chapter, the following words and terms shall have the following meanings, unless the context indicates otherwise:

**ALERT LIMIT:** The level at which, if exceeded by a significant industrial user, it is recommended that the POTW or City conduct an evaluation to determine if that discharge had or is having impact on the plant effluent quality, and if pass-through or interference was or is occurring leading to compliance concerns at the POTW, then voluntary correction or enforcement action is recommended.

**APPROVED LABORATORY PROCEDURES:** The measurements, tests and analysis of the characteristics of water and wastes in accordance with analytical procedures as established in 40 CFR Part 136 as revised.

**AVERAGE QUALITY:** The arithmetic average (weighted by flow value) of all the "daily determinations of concentration," as that term is defined herein, made during a calendar month.

**BEST MANAGEMENT PRACTICES or BMPs:** The schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to implement the prohibitions listed in 40 CFR 403.5(a)(1) and (b). BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw materials storage.

**BOD (biochemical oxygen demand):** The quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory conditions for five (5) days at a temperature of twenty degrees (20°C) centigrade, expressed in milligrams per liter.

**BRANCH SEWER:** An arbitrary term for a sewer which receives sewage from lateral sewers from a relatively small area.

**BUILDING CONNECTION:** The connection to the public sewer and extension therefrom of the sewer to the property line in an alley or street, or to the easement line in an easement, whichever is applicable, depending on the location of the public sewer.

**BUILDING OFFICIAL:** The Chief Building Inspector, or authorized representative.

**BUILDING SEWER:** The service line from the building to the sewer main.

**BYPASS:** The intentional diversion of waste streams from any portion of an industrial user's facility.

**CATEGORICAL STANDARD:** Limits for pollutants that are set by the EPA for individual types of industry listed in 40 CFR 403.

**COD (chemical oxygen demand):** The quantity of oxygen consumed from a chemical oxidation of inorganic and organic matter present in the water or wastewater, expressed in milligrams per liter.

**COLLECTION SYSTEM:** Any and all lines, manholes, or other mechanical or physical appurtenances which may be involved with the conveyance of wastewater to or from the City water reclamation plant(s).

**COOLING WATER:** The clean wastewater discharged from any heat transfer system such as condensation, air conditioning, cooling, or refrigeration.

**DAILY COMPOSITE SAMPLE:** A sample of effluent, discharge or other source of pollutants continuously collected, manually or automatically, over a normal operating day. Samples shall be collected over a twenty-four (24) hour period or at least an eight (8) hour period during production, with one (1) sample being drawn at least once every two (2) hours. Composites should be flow proportional wherever feasible.

**DAILY DETERMINATION OF WASTEWATER QUALITY:** For composite samples, "daily determination of wastewater quality" shall be the concentration of any parameter tested in a daily composite sample. For grab samples, the "daily determination of wastewater quality" shall be the arithmetic average (weighted by flow value) of the concentrations of any parameter in each grab sample obtained in any calendar day.

**DEVELOPER:** Any person engaged in the organizing and financing of a sewage collecting system within an area contributing to a branch, main or a trunk sewer of the City sewer system. Such may be either a subdivider or a legally constituted improvement district.

**DISCHARGE:** The disposal of sewage, water or any liquid from any sewer user into the sewerage system.

**DOMESTIC WASTE:** A typical, residential-type waste which requires no pretreatment under the provisions of this chapter before discharging into the sanitary sewer system, excluding all commercial, manufacturing and industrial wastes.

**EFFLUENT:** Wastewater or other liquid - raw, partially or completely treated - flowing from a basin, treatment process, or treatment plant.

**FINAL:** The local limits established by ordinance and to remain in effect which are recommended to remain until the system is reevaluated as a whole, during the next local limits update.

**GRAB SAMPLE:** An individual sample of effluent, discharge or other source of pollutants collected in less than fifteen (15) minutes.

**HAZARDOUS DISCHARGE:** A discharge which is considered by the City to be an imminent hazard to health, the environment, or the POTW.

**INDIRECT DISCHARGE:** The introduction of pollutants into a POTW from any nondomestic source regulated under Section 307(b), (c) or (d) of the Clean Water Act as amended 33 U.S.C. § 1251, et seq.

**INDUSTRIAL PRETREATMENT DISCHARGE PERMIT:** The permit granted by the City to an industrial user granting the right to discharge to the sewer works subject to the terms and conditions set forth in the permit.

**INDUSTRIAL USER:** A source of indirect discharge.

**INDUSTRIAL WASTE:** Any liquid, free-flowing waste, including cooling water, resulting from any industrial or manufacturing process or from the development, recovery or processing of natural resources, with or without suspended solids excluding uncontaminated water.

**INFLOW:** Water other than wastewater that enters a sewer system (including sewer service connections) from sources such as roof leaders, cellar drains, foundation drains, drains from springs and swampy areas, manhole covers, cross connections between stormwater, surface runoff, street wash waters or drainage.

**INTERFERENCE:** Inhibition or disruption of the sewer system, treatment processes or operations which contribute to a violation of any requirement of a National Pollutant Discharge Elimination System permit. The term includes prevention of sewage sludge use or disposal by the cities in accordance with Section 405 of the Act, or any criterial guidelines or regulations developed pursuant to the Solid Waste Disposal Act (SWDA), the Clean Air Act, the Toxic Substances Control Act, or more stringent State criteria (including those contained in any State sludge management plan prepared pursuant to Title IV of SWDA) applicable to the method of disposal or use employed by the City.

**INTERIM:** Guiding limits while the POTW or City investigates other sources of pollutants and ways of controlling those sources.

**LATERAL SEWER:** A sewer which discharges into a branch or other sewer and has no other common tributary to it.

**MAIN SEWER:** A sewer which receives sewage from one (1) or more branch sewers as tributaries.

**MAINTENANCE:** Keeping the treatment works in a state of repair, including expenditures necessary to maintain the capacity (capability) for which said works were designed and constructed.

**NATURAL OUTLET:** Any outlet into a watercourse, ditch, or other body of surface or ground water.

**NPDES PERMIT:** The permit or permits issued to and held by the City under the National Pollutant Discharge Elimination System, pursuant to 33 U.S.C. § 1342 and 40 CFR Parts 122 through 125.

**PARAMETER:** See "TREATMENT PARAMETER."

**PASS-THROUGH:** An effluent flow which exits the POTW in quantities or concentrations which alone or in conjunction with a discharge or discharges from other sources is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

**PERMITTEE, PERMIT HOLDER:** Any person, firm, association, corporation or trust which owns, operates, possesses or controls an establishment or plant being operated under a valid industrial pretreatment permit to discharge waste into the City sewer system.

**pH:** The logarithm of reciprocal of the weight of hydrogen ions in grams per liter of solution.

**POTW:** Publicly owned treatment works.

**PRETREATMENT:** The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into the POTW, as further defined and described in 40 CFR 403.3(q).

**PRETREATMENT STANDARDS or PRETREATMENT REQUIREMENTS:** Any substantive or procedural requirements relating to pretreatment, including the specific pollutant limits set forth in Section 7-02-001-0008.

**PUBLIC SEWER:** A lateral, branch, main or trunk sewer controlled and maintained by the City of Flagstaff.

**RECLAIMED WASTEWATER:** The treated effluent which is the product of the municipal wastewater system, although not suitable for human consumption, may be used for certain industrial or commercial purposes.

**REPLACEMENT:** Those expenditures made for obtaining and installing equipment, accessories and/or appurtenances during the useful life of the treatment works which are necessary to maintain the capacity and performance of the treatment works for which they were designed and constructed.

**REPRESENTATIVE SAMPLE:** A sample which takes a portion of the user's discharge which will be indicative of all the constituents of the discharge.

**SANITARY SEWER:** A sewer which carries sewage and to which storm, surface, and ground waters are not intentionally admitted.

**SEVERE PROPERTY DAMAGE:** Substantial physical damage to property, damage to the treatment facilities which caused them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. "Severe property damage" does not mean economic loss caused by delays in production.

**SEWAGE/SEWERAGE:** A combination of water-carried wastes from residences, business buildings, institutions, and industrial establishments, together with such ground, surface, and stormwater as may be present.

**SEWAGE TREATMENT PLANT:** Any arrangement of devices and structures used for treating sewage.

**SEWER:** A pipe or conduit for carrying sewage.

**SEWER TAP:** Includes hole cut into main line and saddle to which to connect.

**SLUG LOAD:** Any pollutant discharged in quantities large enough to cause interference, upset, or pass-through at the POTW.

**STANDARD INDUSTRIAL CLASSIFICATION (SIC):** A coded classification of industries based upon economic activity developed by the U.S. Department of Commerce as published in the Standard Industrial Classification Manual, 1987, Office of Management and Budget.

**STANDARD METHODS:** The procedure as described in the most current edition of Standard Methods for the Examination of Water and Wastewater published by the American Health Association, or the most current edition of Manual of Methods for Chemical Analysis of Water and Wastes published by the U.S. Environmental Protection Agency.

**STORM SEWER or STORM DRAIN:** A sewer or drainage which carries storm and surface waters, but excludes sewage and polluted industrial wastes.

**SURCHARGE:** An additional charge levied against industrial users for exceeding certain thresholds of BOD or TSS, as described in Section 7-02-001-0040(H) and set forth in Section 7-02-001-0041(A).

**SUSPENDED SOLIDS (SS):** Solids measured in milligrams per liter that either float on the surface of or are in suspension in water, wastewater or other liquids and which are largely removable by a laboratory filtration device, as defined in the "Standard Methods" as defined herein.

**SYSTEM DESIGN CAPACITY:** The design capacity for normal domestic wastewater as established by accepted engineering standards.

**TREATMENT PARAMETER:** A fundamental characteristic of sewage around which treatment is designed, such as, but not limited to, flow, BOD, and suspended solids.

**TSS:** Total suspended solids, expressed in milligrams per liter, in a user's discharge.

TRUNK SEWER: A sewer which receives sewage from many tributary main sewers and serves as an outlet for a large territory.

UPSET: An exceptional incident in which there is unintentional and temporary noncompliance with categorical pretreatment standards because of factors beyond the reasonable control of the industrial user. This does not include noncompliance due to operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

U.S.C.: The United States Code, as amended.

USER: Any person, lot, parcel of land, building, premises, municipal corporation or other political subdivision that discharges, causes or permits the discharge of wastewater into the sewage system.

VOC (volatile organic compounds): Those parameters included in EPA method 624/625.

WASTEWATER SYSTEM: All facilities for collection, pumping, treating, and disposing of sewage. As used in this chapter the terms "sewer system" or "wastewater system" shall have the same meaning and definition.

WATERCOURSE: A channel in which a flow of water occurs, either continuously or intermittently.

#### **7-02-001-0003 INTERFERENCE WITH THE WATER SERVICES DIVISION; DIGGING UP STREETS WITHOUT A PERMIT; TAMPERING WITH EQUIPMENT PROHIBITED**

Every person who shall in any way interfere with employees of the Water Services Division in any discharge of their duties, either in the tapping of any sewer pipe, main, or lateral belonging to the City, or the cleaning, laying, or connection of any such pipe or main or lateral, or who shall dig up or cause to be dug up, any street or alley in the City for the purpose of connecting with the sewer system of the City without first obtaining a permit from the City Engineer, or who, having a permit, shall dig up any portion of any street or alley of the City for the purpose of connecting with the sewer system of the City and shall fail or neglect to place the street or alley in its original condition, or who shall maliciously or willfully break, damage, destroy, uncover, deface, or tamper with any structure, appurtenance, or equipment which is a part of the municipal sewer system shall be guilty of a petty offense.

#### **7-02-001-0004 RESPONSIBILITY FOR CLEANING, REPAIR AND REPLACEMENT OF BUILDING SEWERS AND CONNECTIONS**

##### **A. Property Owner Responsibilities.**

1. The property owner shall be responsible for the cleaning, unstopping, maintenance and repair of the sewer connection piping serving the owner's property from the owner's home or building to the public sewer main.
2. Where the correction of a stoppage requires the repair or replacement of a damaged or broken section which is located off-property in a street or alley, the necessary repairs must be made by a licensed contractor, the scope of which licenses allows **THEM** ~~him~~ to work

within a public right-of-way subject to securing a right-of-way permit from the Engineering Section.

3. After repairs are made to a sewer connection in a concrete or asphalt street, the street shall be cut, filled, and compacted to grade, the top lift being one (1) foot of road base material approved by the City Engineering ~~Section~~ **DIVISION** Section. Upon completion, the street shall be opened to traffic and the City Public Works Division contacted to repair the street.

4. When the repairs to a sewer connection are required under a sidewalk, curb or gutter, the sidewalk, curb or gutter shall be square cut to avoid unnecessary damage. After completion, the excavation shall be backfilled and compacted to grade and the City Public Works Division contacted to repair the sidewalk, curb or gutter.

5. If in the opinion of the City Water Services Director an unnecessary amount of street, sidewalk, or curb and gutter is damaged in the process of making the repair, the contractor shall be charged for the repair of that amount.

**B. City Responsibilities.**

1. If the property owner perceives the location of a sewer service problem to be the City's main sewer line, the property owner should contact the City's Water Services Director.

2. The City will cooperate with the property owner to locate the cause of a sewer service problem, including the performance of appropriate tests or inspections on the City's main line. If the location of the sewer service problem is identified to be in the property owner's service line, responsibility for the repairs shall be pursuant to subsection (A) of this section. The City will cease any repair efforts if responsibility for the repairs falls on the property owner pursuant to subsection (A) of this section.

3. If the location is determined to be in the City's main line, the City will initiate the appropriate repair action.

4. If the location of the sewer problem cannot be identified, the City will proceed with the appropriate excavation to locate the cause of the problem. If the location of the problem is determined to be within the property owner's service line, responsibility for the repairs shall be pursuant to subsection (A) of this section. In addition, the property owner shall reimburse the City for costs incurred by the City in performing the necessary excavation if responsibility for the repair is on the property owner pursuant to subsection (A) of this section. If the location of the problem is within the City's main line, the City shall perform the appropriate repairs and the property owner shall bear no responsibility for the costs of excavation.

**7-02-001-0005 UNSANITARY DISPOSAL OF EXCREMENT PROHIBITED**

It shall be unlawful for any person to deposit, or permit to be deposited, in an unsanitary manner, upon public or private property within the City, or in any area under the jurisdiction of the City, any human or animal excrement or other objectionable waste.

**7-02-001-0006 TREATMENT OF POLLUTED WASTES REQUIRED**

It shall be unlawful to discharge to any natural outlet within the City or in any area under the jurisdiction of the City, any sewage, industrial wastes, or other polluted waters, except where suitable treatment has been provided, in accordance with provisions of this chapter.

## 7-02-001-0007 PROHIBITED SUBSTANCES

A. The Water Services Director shall have the authority to regulate the volume and flow rate of discharge to the sewage works and to establish permissible limits of concentration for various specific substances, materials, or wastes that can be accepted into the sewage works, and to specify those substances, materials, waters or wastes that are prohibited from entering the sewage works.

B. The following are prohibited from **ENTERING** the City wastewater collection system:

1. Any substance that interferes with the POTW or wastewater collection system.
2. Any liquids, solids, or gases which by reason of their nature or quantity could be sufficient, either alone or by interaction with other substances, to cause injury to the POTW from fire or explosion. At no time shall two (2) successive readings on an explosion hazard meter, at the point of discharge to the POTW, be more than five percent (5%), nor any single reading over ten percent (10%), of the lower explosive limit (LEL) of the meters. Prohibited materials include, but are not limited to: gasoline, kerosene, naphtha, trichloroethylene, xylene, ethers, alcohols, ketones, aldehydes, peroxides, chlorates, perchlorates, bromates, carbides, hydrides and sulfides, waste streams with a closed cup flash point of less than one hundred forty degrees (140° **F**) Fahrenheit or sixty degrees (60° **C**) centigrade using the test methods specified in 40 CFR 261.21.
3. Any water which contains a solid or viscous substance which could obstruct the flow in the collection system or interfere with the POTW.
4. Any particles greater than one-half (1/2) inch in any dimension, animal tissues, manure, ashes, cinders, sand, metal, glass, straw, paper, wood, plastics, gas, tar, asphalt and grinding wastes.
5. Any substance that can cause corrosive damage to the POTW or collection system and any substance with a pH of less than 6.0 standard units (s.u.) or greater than 11.0 (s.u.).
6. Any liquid or vapor which causes the temperature entering the POTW to exceed one hundred four degrees (104° **F**) Fahrenheit (40° C) or any liquid or vapor with a temperature greater than one hundred sixty degrees (160° **F**) Fahrenheit (71° C).
7. Any toxic or radioactive substance in sufficient quantity to interfere with the POTW or collection system or to create a health or environmental hazard.
8. Any substance requiring unusual attention or expense of the City unless specifically authorized. Compensatory payments be determined by the City to be paid by the user who contributes any such authorized substance.
9. Any noxious or malodorous liquid, gas or solid which creates a public nuisance, health or environmental hazard, or inhibits entry into any part of the wastewater system for maintenance or monitoring.

10. Any water with a volume greater than twenty (20) **GALLONS PER MINUTE (GPM)** containing dyes, inks or other color-causing substances that change the typical color in the wastewater collection system.
11. Any substance causing a hazard to health or to the environment.
12. Petroleum oil, nonbiodegradable cutting oil or products of mineral oil origin in amounts that cause interference or pass-through.
13. Any trucked or hauled pollutants, except at discharge points designated by the POTW.
14. Unless otherwise approved by the Water Services Director, any stormwater, surface water, groundwater, roof runoff, surface drainage, or unpolluted process waters that may constitute inflow as defined herein.
15. Any combination of substances contributed by one (1) or more users which results in any of the above situations.
16. The following pesticides are expressly prohibited from discharge into the City sewer system: 4,4'-DDD; 4,4'-DDE; 4,4'-DDT; aldrin; and heptachlor.

**7-02-001-0008 STANDARDS FOR DISCHARGE**

A. A technically based determination of local industrial user discharge limits for heavy metals, organics and other pollutants, for which there exists a specific discharge limit at the POTW, be made by the City Water Services Director and EPA. Such determination shall take into account removal percentages of the POTW, and dilution factors.

B. The following specific limits shall apply to all industrial user discharges and may be modified, with prior notice to the industrial user and an opportunity to respond, to comply with applicable State and/or Federal regulations.

<b>Parameter</b>	<b>Maximum</b>	<b>(mg/L)</b>
Inorganics		
Lead	0.08	
Copper	0.20	
Zinc	3.0	
Mercury	0.017	
Cyanide (total)	0.24	
Arsenic	0.18	
Selenium	0.015	
Sulfides	5.0	
HEM [a]	200	
Volatile Organic Compounds		

Parameter	Maximum (mg/L)
Toluene	0.14
Total Trihalomethanes	0.32
Bromide	0.5
Conventional Pollutants	
BOD	700 lb/day*
TSS	130 lb/day*
pH	6.0 < pH ≤ 11.0
Ammonia	173
Total Kjeldahl nitrogen (TKN)	173
Nitrate/nitrite	10

\* Lbs/day = Pollutant concentration in mg/L x 8.34 (pounds/gallon) x flow in million gallons per period.

C. The City may set limits based on mass measurements of pollutants for a particular substance or a particular user if it is necessary for adequate regulation. Discharge limits be set in order to meet any limits set for sludge disposal.

D. Industrial users meet the requirements of the U.S. Code of Federal Regulations, 40 CFR 403 and the amendments thereof. No discharge may exceed any Federal categorical standard or cause the POTW to exceed its AZPDES or APP Permit. The City may request approval to modify a Federal categorical standard, according to 40 CFR 403.

E. Dilution may not be used to meet a standard or limit unless it is expressly authorized by the categorical standard set by the EPA or by the City.

F. Bypass Prohibition.

1. Notice of Bypass to Occur.

a. If an industrial user knows in advance of the need for a bypass, it shall submit prior notice to the Water Services Director, if possible, at least ten (10) days before the date of the bypass.

b. An industrial user shall submit oral notice of an unanticipated bypass that exceeds applicable pretreatment standards to the Water Services Director within twenty-four (24) hours from the time the industrial user becomes aware of the bypass. A written submission shall also be provided within five (5) days of the time the industrial user becomes aware of the bypass. The written submission shall contain a description of the bypass and its cause; the duration of the bypass, including exact dates and times, and, if the bypass has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

2. Prohibition of Bypass. Bypass is prohibited, and the Water Services Division may take enforcement action against an industrial user for a bypass unless:

- a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
- b. There were no feasible alternatives to the bypass;
- c. The user submitted notices as required above.

G. O&M Requirements. Industrial users required to install suitable pretreatment facilities to treat waste streams which do not meet City discharge limits shall provide necessary maintenance on such equipment to ensure their continued and efficient operation.

An industrial violation of City discharge limits, which is due to operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, carelessness or improper operation will not be considered unintentional by the City of Flagstaff.

All industrial users shall maintain their general facilities in such a manner as to eliminate or minimize the possibility of discharge of substances by that industry, which are in violation of applicable pretreatment standards.

#### **7-02-001-0009 INDUSTRIAL CLASSIFICATION**

A. Each industrial user shall be classified into one (1) of the following categories as designated by the Code of Federal Regulations 40 CFR 403.3(t)(1) and (2).

1. Significant - defined as any industry that:
  - a. Is subject to categorical standards as defined by 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N.
  - b. Discharges an average process wastestream of twenty-five thousand (25,000) gallons per day (0.025 **MILLION GALLONS PER DAY** mgd) or more to the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater).
  - c. Contributes a process wastestream which makes up five percent (5%) or more of the average dry weather hydraulic or organic (BOD, TSS, etc.) capacity of the POTW.
  - d. Has a reasonable potential, in the opinion of the Director, to adversely affect the POTW's operation or for violating any pretreatment standard or requirement in accordance with 40 CFR 403.8(f)(6) or this chapter.
2. The Control Authority may determine that an industrial user subject to categorical pretreatment standards under Section 403.6 and 40 CFR Chapter I, Subchapter N is a nonsignificant categorical industrial user rather than a significant industrial user on a finding that the industrial user never discharges more than one hundred (100) gallons per day (gpd) of total categorical wastewater (excluding sanitary, noncontact cooling and boiler blowdown wastewater, unless specifically included in the pretreatment standard) and the following conditions are met:
  - a. The industrial user, prior to the Control Authority's finding, has consistently complied with all applicable categorical pretreatment standards and requirements;

b. The industrial user annually submits the certification statement required in CFR Section 403.12(q) together with any additional information necessary to support the certification statement; and

c. The industrial user never discharges any untreated concentrated wastewater.

B. The City will notify all users of Federal and local requirements which may be applicable to them. Upon request, significant industrial users shall receive a copy of:

1. This chapter;
2. Applicable parts of the U.S. Code of Federal Regulations;
3. An application for an industrial pretreatment discharge permit;
4. Applicable categorical standards;
5. Any other pertinent materials;
6. Any changes in Federal or local requirements as they occur.
7. City Enforcement Response Plan.

C. The industrial user may request certification of its industrial user classification from the EPA according to 40 CFR 403.6(a). The industrial user may request variation from Federal categorical standards according to 40 CFR 403.13 and the Clean Water Act.

#### **7-02-001-0010 INDUSTRIAL SELF-MONITORING**

A. Significant industrial users, at the user's expense, must provide safe and convenient access for sampling by the City. A City-approved manhole must be provided from which a sample that is representative of the total discharge can be taken. There must be unobstructed access to the open flow in the manhole so that a grab sample can be taken and so that sampling equipment can be set up in the manhole.

B. Sampling and analysis must be performed by significant industrial users, at their own expense, at least twice each year, in two (2) separate quarters, (January – March and July – September), and results of such sampling submitted to the City before the last day of each respective quarter or as directed by the City.

C. If a test result is not within the limits of this chapter or the categorical standards from any semiannual sampling, completed by the permitted industrial user, the industrial user shall immediately notify the City within twenty-four (24) hours of becoming aware of the violation (i.e., issuance of final lab report). The industrial user, or the City if they so choose, shall repeat the sampling and analysis and submit the results of the repeat analysis within thirty (30) days after becoming aware of the violation, or more often if it is determined to be necessary by the City.

D. Grab samples must be used when sampling for pH, cyanide, total phenols, oil and grease, sulfide, and volatile organics.

E. Twenty-four (24) hour composite samples must be obtained through flow-proportional composite sampling techniques, where feasible. The City may waive flow-proportional composite sampling for any industrial user that demonstrates that flow proportional sampling is infeasible. In such cases, samples may be obtained through time-proportional composite sampling techniques or through a minimum of four (4) grab samples where the user demonstrates that this will provide a representative sample of the effluent being discharged.

F. The flow must be measured by the industrial user at the time that the sample is taken, according to 40 CFR 403.12.

G. The methods of sampling must be performed in accordance with 40 CFR 136 and any other applicable Federal, State, or local requirements. The sampling location and type must be approved by the City. An authorized representative of the industry (see Section 7-02-001-0012) shall sign and submit with these sample results a statement verifying the validity of the methods and location.

H. All records of sampling, analysis and flows must be kept by the industrial user and the City for at least three (3) years. All records must be available to the City upon request. This period of retention shall be extended during the course of any unresolved litigations regarding the industrial user USER or POTW or when requested by the State Director or the EPA Regional Administrator.

#### **7-02-001-0011 REPORTING REQUIREMENTS**

A. Within one hundred eighty (180) days of the promulgation by the EPA of a categorical standard or within one hundred eighty (180) days of a final administrative decision, the industrial users that are subject to the standard must report the information provided for in 40 CFR 403.12(b). This information must also be supplied by existing sources of discharge as well as new sources that discharge after the standards have been promulgated.

B. All industrial users must immediately report to the Water Services Division any discharge, including accidental discharge, which contains a slug load, a prohibited substance, or any substance which might be harmful to the POTW, the collection system, the environment or to any person.

C. The industrial user must provide a written report (separate from the immediate report) within five (5) days of the detection of the upset. The report must include the nature and volume of the discharge, the period of noncompliance including exact dates and time or if not corrected the anticipated time the upset is expected to continue, the action being taken by the industrial user to correct the problem and preventive measures needed to avoid future spills.

D. The significant industrial user shall report to the City prior to any significant changes in production, including, but not limited to, production rate, product, raw materials utilized, rate of discharge, concentration of pollutants being discharged, etc.

E. If in the course of self-monitoring, a categorical or significant industrial user becomes aware of a violation of the limits set forth in their discharge permit, they shall notify the City within twenty-four (24) hours of becoming aware of such.

F. Repealed by Ord. 2021-10.

G. All industrial users shall notify the POTW, the EPA Regional Waste Management Division Director, and State hazardous waste authorities in writing and within one hundred eighty (180) days of any discharge into the POTW of a substance, which, if otherwise disposed of would be a hazardous waste under 40 CFR Part 261 as required in 40 CFR 403.12(p)(1) through (4).

## **7-02-001-0012 SIGNATORY REQUIREMENTS**

A. The reports required by this chapter must be signed as follows:

1. By a responsible corporate officer, if the industrial user submitting the reports is a corporation. For the purpose of this subsection, a responsible corporate officer means:
  - a. A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or
  - b. The manager of one (1) or more manufacturing, production, or operation facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiate and direct other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; can ensure that the necessary systems are established or actions taken to gather complete and accurate information for control mechanism requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
2. By a general partner or proprietor if the industrial user submitting the reports is a partnership or sole proprietorship respectively.
3. By a duly authorized representative of the individual designated in subsection (A)(1) of this section if:
  - a. The authorization is made in writing by the individual described in subsection (A)(1) of this section;
  - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the facility from which the industrial discharge originates, such as the position of plant manager, operator of a well, or well field superintendent, or a position of equivalent responsibility, or having overall responsibility for environmental matters for the company; and
  - c. The written authorization is submitted to the City of Flagstaff, Water Services Division.
4. If an authorization under subsection (A)(3) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, or overall responsibility for the environmental matters for the company, a new authorization satisfying the requirements of subsection (A)(3) of this section must be submitted to the Division prior to or together with any reports to be signed by an authorized representative.

## **7-02-001-0013 CONFIDENTIALITY OF BUSINESS INFORMATION**

A. Any information, except effluent data as defined by 40 CFR 2.302, submitted to the City of Flagstaff pursuant to this chapter, may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "CONFIDENTIAL BUSINESS INFORMATION" on each page containing such information. If no claim is made at the time of submission, the City may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2 (Public Information).

B. For the purposes of this section "effluent data" shall be defined as:

1. Information necessary to determine the identity, amount, frequency, concentration, temperature, or other characteristics (to the extent related to water quality) of any pollutant which has been discharged by the source (or of any pollutant resulting from any discharge from the source), or any combination of the foregoing;
2. Information necessary to determine the identity, amount, frequency, concentration, temperature, or other characteristics (to the extent related to water quality) of the pollutants which, under an applicable standard or limitation, the source was authorized to discharge (including, to the extent necessary for such purpose, a description of the manner or rate of operation of the source); and
3. A general description of the location and/or nature of the source to the extent necessary to identify the source and to distinguish it from other sources (including, to the extent necessary for such purposes, a description of the device, installation, or operation constituting the source).

C. For the purposes of this section, the following shall be considered to be "effluent data" only to the extent necessary to allow the regulatory agency having jurisdiction to disclose publicly that a source is (or is not) in compliance with an applicable standard or limitation, or to allow such regulatory authority to demonstrate the feasibility, practicability, or attainability (or lack thereof) of an existing or proposed standard or limitation:

1. Information concerning research, or the results of research, on any product, method, device, or installation (or any component thereof) which was produced, developed, installed, and used only for research purposes; and
2. Information concerning any product, method, device, or installation (or any component thereof) designed and intended to be marketed or used commercially but not yet so marketed or used.

## **7-02-001-0014 INTERCEPTORS; TYPE, CAPACITY, LOCATION, MAINTENANCE**

A. The City of Flagstaff has adopted a Fats, Oils, and Grease (FOG) Discharge Manual for regulatory compliance. A copy of this plan will be posted on the Division website and is maintained by the City Clerk as a public record. The manual describes: (1) owner pretreatment requirements; (2) installation, operation, and maintenance standards; (3) participating pumper program; (4) plan review process; (5) waiver process.

B. A City-approved grease interceptor is required for a food service establishment (FSE). An FSE is defined as an operation that stores, prepares, serves, vends, or otherwise provides food for human consumption at the retail level. Grease interceptor sizing is to be in accordance with the City's FOG Discharge Manual.

C. A City-approved sand/oil interceptor is required for any business that performs automotive repairs or service facilities that wash vehicles, or business where oily and flammable liquid wastes are produced. A two (2) week notice is required for an inspection if contents will be taken to a City-owned facility.

D. A City-approved lint interceptor is required for any business with more than one (1) residential size washing machine or any amount of industrial size washing machines. An industrial size washing machine is one that has a tub three and one-half (3.5) cubic feet or larger and/or an American Household Appliance Manufacturers Association ("AHAMA") capacity of twenty-five (25) pounds or more. Residential machines will be any washing machine with less capacity than industrial machines.

E. If a blockage is found in the collection system and it can be determined by the City to be caused by a particular user's discharge, then the City can require the user to install a City-approved interceptor, at the user's expense, to catch the substance causing the blockage. If any interceptor is determined by the City to be inadequate in size or design, the City may require the user to install or upgrade such interceptor at the user's expense.

F. All interceptors shall be of a type and capacity approved by the Director and shall be located to be readily and easily accessible for cleaning and inspection.

G. Sand/oil interceptors shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature. They shall be of substantial construction, watertight, and equipped with easily removable and accessible covers. When bolted covers are required, they shall be gastight and watertight.

H. All interceptors shall be maintained by the owner and/or user at his or her own expense. The interceptor must always be kept in continuously efficient operation and a record of maintenance performed on such interceptor shall be kept by the user on a form (or other means) provided by the City.

I. The City shall periodically inspect such interceptors and/or records to ensure they are being kept in efficient operation. A cleaning schedule will be set by the City.

## **7-02-001-0015 CONTROL MANHOLES**

When required by the Water Services Director, the owner of any property served by a building sewer carrying potentially harmful or industrial wastes shall install a suitable control manhole in the building sewer to facilitate observation, measurement and sampling of the wastes. Such manhole, when required, shall be accessible and safely located and shall be constructed in accordance with plans approved by the Director. The manhole shall be installed by the owner at **THEIR** his expense and shall be maintained by **THEM** him-so as to be safe and accessible at all times. Users whose effluent must be treated before it enters the wastewater collection system or whose effluent may potentially contain any prohibited substance may be required to install a control manhole for sampling purposes. The manhole must be located so that a representative

sample can be taken and there must be unobstructed access to the open flow in the manhole so that a grab sample can be taken and so that sampling equipment can be set up in the manhole.

#### **7-02-001-0016 INSPECTIONS AND MONITORING**

A. Any authorized employee of the Water Services Division shall, upon presentation of their credentials, have access to any commercial or industrial premises connected to or disposing of any type waste to the City wastewater system for the purpose of surveillance and/or an inspection of the premises to determine the nature and quantity of wastes discharged to the City wastewater system, or for examining or copying records, required by 40 CFR 403.12(m). The commercial/industrial user must make available to the City any and all records which would enable them to make an accurate determination of the constituents and flow of the user's waste stream.

B. Authorized employee of the Division, whose duty it may be to enter upon commercial or industrial premises to make inspections and collect samples or measure the quantity of wastes discharged to the City sewer, shall be provided with credentials to identify them as authorized representatives for the Division.

C. No person, except an authorized employee of the Division, shall have or exhibit any credentials of that Division. It shall be the responsibility of each employee or authorized representative of the Division, upon resignation or dismissal, to deliver and surrender at the office of the Water Services Director all credentials of the Division in his/her possession.

D. Questionnaires will be provided to all new businesses entering the City of Flagstaff to gather information pertaining to waste that may be generated by such. If any waste other than domestic is discharged from such an establishment, the City may perform an inspection of such premises at least annually or more often as necessary to determine its status of compliance with this chapter.

E. The City of Flagstaff or its designated representative shall have the authority to randomly sample industrial user waste streams and analyze for any pollutants that would be anticipated to be present for that particular user utilizing EPA approved methods. The City will review and analyze self-monitoring reports submitted by industrial users and make notification to such user of any compliance action to be taken as a result of such.

F. The information from the City's inspection and monitoring activity will be available to the administrative authority of the State and/or EPA. This information will also be made available to the general public upon request with the exception of that information protected by Section 7-02-001-0013. The City will maintain these records for a minimum of three (3) years.

G. Repealed by Ord. 2021-10.

#### **7-02-001-0017 PROVISION OF FALSE INFORMATION**

A. Reports, documents, questionnaires or any other information provided to the City as required by this chapter by a commercial or industrial user shall be subject to:

1. The provisions of 18 U.S.C. § 1001 relating to fraud and false statements.

2. The provisions of Sections 309(c)(4) of the Act, as amended, governing false statements, representation or certification.
3. The provisions of Section 309(c)(6) of the Act regarding responsible corporate officers.

B. Failure or refusal by the industrial user to provide information requested by the City as provided for in this chapter will result in enforcement action being taken against such user.

#### **7-02-001-0018 PUBLIC NOTIFICATION, DEFINITION OF SIGNIFICANT VIOLATION**

A. The City shall give notice of any decisions being made about the pretreatment program which may interest the public, special interest groups, or government agencies. Information about the operation or requirements of the program will be given to any party which requests it. The Water Commission may be used for public information and input if there is an interest expressed in this.

B. The City will publish in the largest local newspaper, at least once each year, a list of industrial users who have not been in compliance with any substantial portion of this chapter at any time during the previous year. For the purpose of this section, an industrial user is in significant noncompliance if its violation meets one or more of the following criteria:

1. Chronic violation of wastewater discharge limits, defined here as those in which sixty-six percent (66%) or more of all of the measurements taken during a six (6) month period exceed (by any magnitude) the daily maximum limit or the average limit for the same pollutant parameter;
2. Technical review criteria (TRC) violations, defined here as those in which thirty-three percent (33%) or more of all of the measurements for each pollutant parameter taken during a six (6) month period equal or exceed the product of the daily maximum limit or the average limit multiplied by the applicable TRC (TRC = 1.4 for BOD, TSS, fats, oil and grease, and 1.2 for all other pollutants except pH);
3. Any other violation of a pretreatment effluent limit (daily maximum or longer-term average) that the Control Authority determines has caused, alone or in combination with other discharges, interference or pass through (including endangering the health of POTW personnel or the general public);
4. Any discharge of a pollutant that has caused imminent endangerment to human health, welfare or to the environment or has resulted in the POTW's exercise of its emergency authority to halt or prevent such a discharge;
5. Failure to meet within ninety (90) days after the schedule date, a compliance schedule milestone contained in a local control mechanism or enforcement order for starting construction, completing construction, or attaining final compliance;
6. Failure to provide, within thirty (30) days after the due date, required reports such as baseline monitoring reports, ninety (90) day compliance reports, periodic self-monitoring reports, and reports on compliance with compliance schedules;
7. Failure to accurately report noncompliance;

8. Any other violation or group of violations which the Water Services Director determines will adversely affect the efficient operation of the City water reclamation plants or implementation of this chapter.

#### **7-02-001-0019 ENFORCEMENT**

This chapter will be enforced pursuant to the general enforcement provisions found in Chapter 7-01, and any additional specific enforcement procedures set forth herein.

#### **7-02-001-0020 UPSET AN AFFIRMATIVE DEFENSE**

An upset shall constitute an affirmative defense to an action brought for noncompliance with categorical pretreatment standards if the industrial user can demonstrate through properly signed contemporaneous operating logs, or other relevant evidence, that:

- A. An upset occurred and the industrial user can identify the specific cause(s) of the upset;
- B. The facility was at the time being operated in a prudent and ~~workman-like~~ QUALITY manner and in compliance with applicable operation and maintenance procedures;
- C. The industrial user has submitted the reports required in Section 7-02-001-0011 in a timely manner.

#### **7-02-001-0021 SUSPENSION OF WATER AND/OR SEWER SERVICE**

- A. For hazardous discharges: The violation of any section of this chapter shall be sufficient cause for the City to discontinue, after informal notice (phone call), water or sewer service to any premises that appears to present an imminent endangerment to the health and welfare of persons or the POTW.
- B. For instances of noncompliance other than hazardous discharges: The City will provide written notice to the industrial user, by certified, return receipt requested mail, at least twenty-four (24) hours in advance and provide the industry with an opportunity to respond before proceeding with discontinuance of water or sewer service.
- C. Such service shall not be restored until the violations have been discontinued or eliminated and the City may undertake any legal proceedings as may be necessary to halt, enjoin or punish the illegal discharge, and/or to recover any expenses the City may incur as a result of handling or eliminating any illegal discharge.

#### **7-02-001-0022 DISREGARD OF SAMPLES**

In any circumstance in which clear and convincing evidence demonstrates, to the satisfaction of the Director, that one (1) or more effluent samples or analyses thereof taken or performed by or for an industrial user, as required by Section 7-02-001-0010 and/or such user's wastewater discharge permit or compliance schedule, is not accurate or representative of such user's discharge, then the director or his designee may, but shall not be required to, disregard such sample(s) or analysi(e)s for purposes of determining any surcharge or penalty imposed by this chapter; provided, that such action by the Director (or designee) does not contravene any State or Federal law, rule or regulation. The foregoing authorization of the Director to disregard samples or analyses shall (A) create no independent right in any industrial user, and (B) be

exercised, if at all, in the sole discretion of the Director. Any determination made by the Director hereunder shall be final.

#### **7-02-001-0023 CREDIT FOR PRETREATMENT EXPENDITURES**

The Director as part of a consent order or similar negotiated settlement may, but shall not be required to, allow a credit against, or grant a rebate of, any surcharge or penalty imposed for violation of any pretreatment standards, for up to sixty percent (60%) of such substantiated expenditures made within one (1) year of such violation for improvement of the industrial user's pretreatment facilities as the Director, in his sole discretion, shall determine as appropriate and likely to correct or ameliorate the violation giving rise to such surcharge or penalty. The foregoing authorization of the Director to credit pretreatment expenditures or grant rebates therefor shall not apply to any surcharge or penalty resulting from a violation of pretreatment standards that causes:

- A. A pass-through or interference at the POTW;
- B. A violation of any requirement of the POTW's NPDES permit; or
- C. An endangerment of the health or safety of POTW personnel or the general public.

#### **7-02-001-0024 PUBLIC RECLAIMED WASTEWATER PIPELINE AND SEWER EXTENSIONS; APPROVAL BY CITY ENGINEER**

No public reclaimed wastewater pipeline or public sewer extension shall be made until the plans and specifications are approved by the City Engineer. Public reclaimed wastewater pipeline and public sewer extensions shall be constructed in accordance with standards and specifications as set forth in the City of Flagstaff General Construction Standards and Specifications. Such document is on file in the office of the City Engineer.

#### **7-02-001-0025 CONSTRUCTION AND OWNERSHIP OF PUBLIC RECLAIMED WASTEWATER PIPELINES, PUBLIC SEWER LINES AND OTHER EQUIPMENT MAINTAINED BY DIVISION**

- A. In new subdivisions and developments where public sewers are authorized by the City, such public sewers shall be constructed at the developer's expense. Detailed plans and specifications for public sewer extensions must be approved by the City Engineer prior to construction. The engineering cost for the preparation of plans and specifications, the staking of the location of the new public sewers, the cost of inspecting the construction, the preparation of as-built plans and the cost of easements shall be assumed by the developer. The City will perform the inspection during construction at the developer's expense.
- B. The ownership of all public sewer lines, pumping stations, treatment facilities, and equipment and other appurtenances to the sewer system maintained, or accepted for maintenance by the Division shall be vested in the City, and in no case shall the owner of any premises have the right to claim any part except where otherwise provided in this code.
- C. Where extensions of public reclaimed wastewater pipelines are authorized by the City, such pipelines shall be constructed at the reuser's expense. Detailed plans and specifications for public reclaimed wastewater pipeline extensions shall be approved by the City Engineer prior to construction. The engineering cost for the preparation of the plans and specifications, the

staking of the location of the new reclaimed wastewater pipeline, the cost of inspecting the construction, the preparation of as-built plans and the cost of easements shall be assumed by the reuser. The City will perform the inspection during construction at the reuser's expense.

D. The ownership of all public reclaimed wastewater pipelines, pumping stations, treatment facilities, equipment and other appurtenances to the reclaimed wastewater system maintained, or accepted for maintenance by the City shall be vested in the City, and in no case shall the owner of any premises have the right to claim any part except where otherwise provided in this code.

## **7-02-001-0026 PUBLIC RECLAIMED WATER PIPELINE EXTENSION AND CONVERSION POLICY FOR REUSERS**

A. Definitions. For the purpose of this section, the following words and phrases shall have the meanings respectively ascribed to them herein, unless the text clearly indicates otherwise:

**CONVERSION AGREEMENT FOR RECLAIMED WATER:** A written agreement between the City and the reclaimed water reuser for reimbursement of the City's costs incurred in converting the reuser's potable water system to a reclaimed water system, by the extension of, and connection to, a public reclaimed water pipeline, approved by the City Council and executed in the name of the City by the Mayor.

**POINT OF DELIVERY:** A location designated by the City for acceptance and measuring of the reclaimed water by the reuser. The point of delivery shall include a vault, pit, meter, valves, and other appurtenances necessary to meter reclaimed water to the reuser.

**RECLAIMED WATER AGREEMENT:** A written agreement between the reclaimed water reuser and the Division for connection to an existing public reclaimed water pipeline, approved and executed in the name of the Water Services Director.

**REIMBURSEMENT AGREEMENT FOR RECLAIMED WATER:** A written agreement between the reclaimed water reuser and the City for reimbursement of the reuser's costs incurred in providing for the extension of, and connection to, a public reclaimed water pipeline, approved by the City Council and executed in the name of the City by the Mayor.

**REUSER:** Any person or persons requesting or required to connect to the reclaimed water system of the City for any residential or nonresidential use, use where potable water quality is not required by City, State, or Federal regulations.

B. Plans and Specifications for Public Reclaimed Water Pipeline Extensions. A reuser who wishes to extend or install reclaimed water facilities must employ an engineer, registered in Arizona, to perform the field engineering and prepare detailed plans and specifications for the extension in accordance with good engineering practice, and adopted general construction standards and specifications of the City and regulations of the Arizona Department of Environmental Quality for the reuse of water. The final detailed plans and specifications for the reclaimed water pipeline extension shall be approved by the City Engineer before construction begins.

C. Costs of Extensions and Conversions. The reuser causing an extension of a public reclaimed water pipeline, conversion of an existing irrigation system to reclaimed water, and the construction of the point of delivery shall pay in full for the rights-of-way and easements, the

purchase, construction and installation of the reclaimed water pipeline, and all other costs of the extension and/or conversion. However, the City reserves the right to increase the diameter of the extension through cash or a reimbursement agreement.

D. Recovery of Costs of Extensions and Conversions. Subject to City approval, reusers may recover costs incurred from converting an existing irrigation system to use reclaimed wastewater or from extending public reclaimed water pipelines in accordance with subsection (C) of this section. Recovery of costs shall be in the form of a rebate amounting to ten percent (10%) per year of said costs for a period of ten (10) years. Rebates shall be paid to the reuser at the end of each full calendar year of reclaimed water usage. The total amount of the allowable costs to be recovered shall be agreed to prior to the reuser obtaining reclaimed water and shall be in the form of a written agreement between the City and the reuser. No interest shall be paid to the reuser on the costs being recovered.

E. Replacement and/or Repair. All persons or other entities who create, cause to be built, or build any such extensions of services as contemplated herein or convert existing irrigation systems to use reclaimed water, shall also pay for any and all such replacements as becomes necessary as a direct or indirect result of the creation, building or construction of such extensions and/or conversions. For example, repairs or replacements of sidewalks, paving or other utilities damaged or disturbed during the building of reclaimed water pipeline extensions and/or conversions. Costs of said replacements and/or repairs may be included in the costs incurred from subsection (D) of this section.

F. Reimbursement Agreement Between City and Reuser. Before the reuser incurs any costs in the extension of any public reclaimed water pipeline to provide service for any individual or property, the reuser desiring such service shall execute a reimbursement agreement for reclaimed water with the City which shall include the following:

1. A warranty of workmanship **QUALITY OF WORK** and materials for public reclaimed water pipelines and facilities installed which shall run to the benefit of the City for a period of at least one (1) year from the date of acceptance by the City.
2. A diagram of all property which will be served by the reclaimed water pipeline to be installed and an irrigation plan for the property.
3. A statement that the City acquires ownership of public reclaimed water pipelines, appurtenances, and easements upon completion and acceptance by the City.
4. The regulations for reuse of reclaimed water, quantity, quality, and cost of the reclaimed water.
5. The terms for cost recovery by the reuser of reclaimed water pipeline extension and/or conversion costs if applicable.

G. Conversion Agreement between City and Reuser. Before the City incurs any costs in the extension of any public reclaimed water pipeline needed to convert a reuser's private, potable water system to a reclaimed water system, the City and the reuser shall execute a conversion agreement for reclaimed water. Conversion agreements are subject to City approval and limited to projects that provide a "net present value" cost recovery to the City within ten (10) years. Net present value shall be determined by the estimated cost of the project and the current prime interest rate. Recovery of costs shall be in the form of billing for consumption of reclaimed water

at seventy-five percent (75%) of the reuser's present potable water rate. Recovery of costs estimates shall be based on consumption history as determined by the City, or on an engineered estimate in the case of new sites. The availability of conversion agreements shall always be subject to budgetary constraint. Conversion agreements shall include, but not necessarily be limited to, the following:

1. Place of use;
2. Quality standards;
3. Point of delivery;
4. Commodity rate;
5. Costs to City;
6. Costs to user;
7. Compliance with regulations;
8. Commencement of service;
9. Termination of service;
10. Resale of reclaimed water;
11. Inspection.

H. Penalty. Any person who excavates or causes an extension to be made for the purpose of laying any reclaimed water pipeline in public streets, alleyways or upon the property of the City without first complying with the provisions hereof, shall be subject to a fine of not less than two hundred dollars (\$200.00) nor more than three hundred dollars (\$300.00). A separate offense shall be deemed committed upon each day during or on which a violation occurs or continues.

I. The Director shall approve, execute and enforce reclaimed water agreements, for the purpose of expanding the reclaimed water program to all residential and nonresidential reusers located adjacent to existing public reclaimed water pipelines.

J. Reclaimed Water Agreement between the Division and the Reuser. Before connecting to an existing public reclaimed water pipeline, the reuser requesting such connection shall execute a reclaimed water agreement with the Division which shall include, but not necessarily be limited to, the following:

1. Place of use;
2. Quality standards;
3. Point of delivery;
4. Commodity rate;

5. Costs to user;
6. Compliance with regulations;
7. Commencement of service;
8. Termination of service;
9. Resale of reclaimed water;
10. Inspection.

#### **7-02-001-0027 MAIN SEWER EXTENSION POLICY FOR AREAS BEYOND PRESENT CITY TRUNK LINES**

A. Definitions. For the purpose of this section, the following words and phrases shall have the meanings respectively ascribed to them herein, unless the text clearly indicates otherwise:

CITY: The word "City" shall mean the City of Flagstaff in the County of Coconino and the State of Arizona, except as otherwise indicated.

DEVELOPER-OWNER: Any person or persons requesting or required to connect to the sewer system of the City in developing one (1) or more parcels of land. The term includes subdividers, industrial developers, private property owners, companies and legally constituted improvement districts who improve or serve with sewers, platted or unplatted property.

SEWER LINES includes:

1. LATERAL SEWER: A sewer which discharges into a branch or other sewer and has not other common sewer tributary to it.
2. BRANCH SEWER: An arbitrary term for a sewer which receives sewage from lateral sewers from a relatively small area.
3. MAIN SEWER: A sewer which receives sewage from one (1) or more branch sewers as tributaries.
4. TRUNK SEWER: A sewer which receives sewage from many tributary main sewers, and serves as an outlet for a large territory.

B. Plans and Size of Sewer Line Extensions. A developer-owner who wishes to extend or install sewer facilities must employ an engineer, registered in Arizona, to perform the field engineering and prepare detailed plans and specifications for the sewer extension in accordance with good engineering practice, and adopted standards set forth in the Uniform Building Code (current adopted edition), Uniform Fire Code (current adopted edition), general construction standards and specifications of the City, current subdivision regulations, general land use plan currently adopted, and any applicable State health regulations and any applicable City Code requirements or standards. The final detailed plans and specifications for the sewer extensions must be approved by the City Engineer before construction begins.

C. Costs of Extension. The developer-owner causing an extension of sewer line shall pay in full for the rights-of-way and easements, the purchase, construction and installation of the sewer lines, and all other costs of extension. However, the City reserves the right to increase the diameter of the extension, if it is deemed advisable, and the City may participate in the oversizing costs, through cash or a reimbursement agreement.

D. Replacement of Repair. All persons or other entities who create, cause to be built, or build any such extensions of any such services as contemplated herein shall also pay for any and all such replacements as becomes necessary as a direct or indirect result of the creation, building or construction of such extensions. For example, repairs or replacement of sidewalks, paving or other utilities damaged or disturbed during the building of sewer line extensions.

E. Agreement between City and Developer-Owner. Before the extension of any sewer line shall be made to serve a subdivision, platted or unplatted property, to provide service for any individual or unplatted property, the developer-owner desiring such service shall execute an agreement with the City which shall include the following:

1. A warranty of ~~workmanship~~ **QUALITY OF WORK** and materials for sewer lines and facilities installed which shall run to the benefit of the City for a period of at least one (1) year from the date of acceptance by the City.
2. A diagram of all property which may be served by any sewer line to be installed.
3. A statement that the City acquires ownership of sewer line appurtenances and easements upon completion and acceptance of the work by the City.
4. A statement of the developer-owner's proportionate share of the cost for previously installed sewer lines if any reimbursement agreements are in existence concerning the sewer line.

#### **7-02-001-0028 PRIVATE SEWERAGE SYSTEMS; CONSTRUCTION AND MAINTENANCE WITHIN THE CITY PROHIBITED GENERALLY**

Except as provided in this chapter, it shall be unlawful to construct or maintain within the City any privy, privy vault, septic tank, cesspool, or other facility intended or used for the disposal of sewage.

#### **7-02-001-0029 PRIVATE SEWERAGE SYSTEMS; WHEN PERMITTED, TO BE CONSTRUCTED AND MAINTAINED IN SANITARY MANNER**

Where in a public sanitary sewer is not available within the City, or in any area under the jurisdiction of the City, the building sewer shall be connected to a private sewage disposal system, complying with the provisions and recommendations of the Arizona Department of Health Services and the Sanitary Code of the County Health Department. Such private sewage disposal system shall be constructed, maintained, and operated at all times in a sanitary manner.

#### **7-02-001-0030 PRIVATE SEWERAGE SYSTEMS; DISCONTINUANCE**

At such time as a public sewer becomes available to property served by a private sewage disposal system, a direct connection shall be made to the public sewer in accordance with the

provisions of this chapter and any septic tank, cesspool or similar private sewage disposal facilities shall be abandoned and filled with suitable material within ninety (90) days of the aforesaid connection.

#### **7-02-001-0031 PRIVATE SEWERAGE SYSTEMS; AUTHORITY OF DIRECTOR OF HEALTH DEPARTMENT**

No statement contained in the preceding two (2) sections shall be construed to interfere with any additional requirements that may be imposed by the Health Departments of the State and County.

#### **7-02-001-0032 PERMIT REQUIRED**

No unauthorized person shall uncover, make any connections with or opening into, use, alter, or disturb any public sewer or appurtenance thereof without first obtaining a written permit from the City Community Development Division.

#### **7-02-001-0033 APPLICATION FOR BUILDING CONNECTION**

Each person desiring a building connection shall make application to the Community Development Division. All applications for building connections to be constructed by Water Services Division shall be accompanied by the current fee for such work.

#### **7-02-001-0034 DIRECTOR TO APPROVE DESIGN NUMBER, LOCATION, SIZE AND CONSTRUCTION OF BUILDING CONNECTIONS**

The design, number, location, manner of connection and size of all building connections shall be subject to the approval of the Water Services Director. The Division will install all building connections less than eight (8) inches in diameter, except as provided elsewhere in this chapter. All building connections eight (8) inches in diameter or larger shall be installed by a private contractor at the property owner's expense. Building connections shall be installed on lateral branch and main sewers only, unless specifically authorized and approved by the Director. All building connections shall be constructed in accordance with standards and specifications on file in the Engineering Section.

#### **7-02-001-0035 SPECIAL PROVISIONS FOR INSTALLING BUILDING CONNECTIONS IN NEW SUBDIVISIONS AND DEVELOPMENTS**

In new subdivisions or developments where public sewer extensions are authorized by the City and constructed at the developer's expense, the City may authorize the developer or his agent, if he so desires, to install building connections with "wyes" and connect the building sewers to the building connection under the following provisions:

A. The construction of the public sewer, building connections, and connections of the building sewers to the building connection shall be under the supervision of a registered engineer holding registration in the State, who shall submit "as-built transparency plans," bearing the registered engineer's registration seal and number, to the Engineering Section. It shall be the duty of the developer to require that all building connections, serving lots in the development upon which no buildings are constructed, be effectively sealed until such time as buildings will be constructed on the lots left vacant. Such sealed connections shall be inspected and approved by the City Engineer before being backfilled and shall be designated for location on

the "as-built plans." The effective seal shall consist of a vitrified clay stopper inserted in the bell of the sewer extending to the property line from the public sewer; such stopper shall be jointed according to the standard details on file in the Engineering Section.

B. Before any building sewer construction is commenced, plumbing permits must be obtained by the developer or his agent from the Building Official.

C. When the "as-built plans" are prepared by the Engineering Section, a record of the building connections will be made.

### **7-02-001-0036 RECORDS TO BE KEPT BY COMMUNITY DEVELOPMENT**

The Community Development Division shall keep a record of all building connections made, the purpose for which they are to be used.

### **7-02-001-0037 SEWER TAP FEE**

Each person, firm or corporation requesting a sewer tap to be installed by the City shall pay the fee as hereby established:

Four (4) inch sewer tap: ~~\$275.00~~ \$400.00.

Six (6) inch sewer tap: ~~\$275.00~~ \$400.00.

Procedures for owner/contractor:

Owner/contractor shall pay ~~buy-in~~ CAPACITY FEES charges if applicable.

Owner/contractor shall obtain a permit from the Engineering ~~Section~~ DIVISION and pay a permit fee before starting excavation.

When notified by ARIZONA 811 ~~the Flagstaff Blue Stake Center~~, Division personnel will locate the sewer main for owner/contractor.

Owner/contractor excavates site and shores trench if necessary, shoring shall be determined by Division personnel.

Owner/contractor provides barricades, lights and traffic control as determined by the Engineering Inspector.

Wastewater collection personnel installs the saddle and makes the tap in the sewer main.

Owner/contractor installs building connection to the saddle and completes the connection.

Engineering Inspector inspects the owner/contractor's work and approves if work is completed satisfactorily.

Owner/contractor compacts and backfills trench, replaces pavement if necessary.

Final inspection is done by the Engineering Inspector.

Approval (permit sign-off) is made by the Engineering Inspector.

Owner/contractor shall not tap the main sewer at any time.

### 7-02-001-0038 SEWER USER CHARGES

In order to provide for the protection of the public health, safety and welfare of the citizens of Flagstaff, a system of charges for sewerage use services is hereby established.

### 7-02-001-0039 THE COLLECTION OF USERS CHARGES SHALL BE UNDER THE DIRECTION OF THE CITY'S FINANCE MANAGEMENT SERVICES DIRECTOR

The Finance MANAGEMENT SERVICES Director is authorized to collect all user charges, industrial cost recovery charges and all other charges prescribed by this chapter.

### 7-02-001-0040 RATE ESTABLISHMENT AND REVIEW PROCEDURE

A. Rates established by ordinance of the City Council shall be based upon the City's determination of the cost of rendering sewerage services. The rates shall be established to provide for adequate funding for operation and maintenance of sewage works as required by the Environmental Protection Agency. The Council may also consider the funding of debt service, capital replacement, capital improvements and other costs through user charges.

B. In addition to other pertinent factors deemed relevant by the City Council, the rate schedules adopted by the City Council may include the following cost factors:

1. Appropriate indirect costs of the Division and other City divisions in rendering sewer related services such as purchasing, accounting, billing, administration, equipment maintenance, and other indirect costs.
2. Annual debt service charge for the retirement of sanitary sewer bonds.

C. Rate schedules shall distribute cost based upon the volume of wastewater discharged as well as BOD and SS of the wastewater discharged.

D. ~~The method to be used for determining user charges expressed in a formula is:~~

$$\text{Rate} = \frac{\text{Total Cost* of Flow}}{\text{Total Flow}} + \frac{\text{Total Cost* of BOD or COD}}{\text{Total BOD or COD}} + \frac{\text{Total Cost * of SS}}{\text{Total SS}}$$

User Charge = Rate X User's Units of Contribution

~~\*Cost = Operation and Maintenance plus Replacement Cost~~

~~The basis for the units of contribution shall consider volume (as determined by water meters or estimates).~~

E. Financial Management System. The user charge system shall include an adequate financial management system that will accurately account for O&M revenues and expenditures

associated with the treatment works. The accounting system must segregate O&M revenue and expenditure from other wastewater revenue and expenditures to assure adequate revenue to properly operate and maintain the treatment works. All revenues collected for operation and maintenance (including replacement) shall be deposited in a separate fund. This fund shall have two (2) accounts, one (1) for O&M and one (1) for replacement.

F. Notification. All users of the system shall be notified at least annually in conjunction with a regular billing for sewage service as to:

1. The rate schedule in effect.
2. The part of user charges attributable to wastewater treatment services.

G. Inconsistent Agreements. The user charge system shall take precedence over any terms or conditions of agreements or contracts between the City and users (including industrial users, special districts, other municipalities, or Federal agencies or installations) which are inconsistent with the requirements of Section 204(b)(1)(A) of the Clean Water Act and these regulations.

H. Toxic Pollutants and Pollutants in Excess of Specified Limits. The user charge system shall provide that each user which discharges any toxic pollutants or others which cause an increase in the cost of managing the effluent or the sludge of the City's treatment works shall pay for such increased costs by the following formula:

Total Cost\* of Any Pollutant

Surcharge = Total of Any Pollutant

\*Cost = Operation and Maintenance Plus Replacement Costs

I. Wastewater Treatment By-Products. All revenue from the sale of treatment related by-products shall be used to offset the cost of operation and maintenance. User charges shall be proportionally reduced for all users. Total annual revenues received from the sale of a by-product shall be credited to the treatment works O&M cost no later than the fiscal year immediately following their receipt.

## **7-02-001-0041 SEWER USE CHARGES, CAPACITY CHARGES**

The sewer user charges to be charged by the Finance ~~Finance~~ **CUSTOMER SERVICE** Section to all users and to all others that have reasonable access to sewer mains is presented in the following schedule:

The City Council may adjust these rate schedules as they deem necessary.

A. Sewer User Charges.

### **MONTHLY RATE PER 1,000 GALLONS OF WATER CONSUMPTION**

The following monthly service rates shall be charged for customers receiving City of Flagstaff sewer service inside the limits of the City of Flagstaff. ~~Sewer charges are based on water consumption. Flat rate charge (dollars/1,000 gallons) for residential based on winter quarter average water use. Other customer classes based on actual water use (dollars/1,000 gallons).~~

The monthly base service charge applies whether the water meter is active or inactive. The monthly service charge is based on the fixed cost of operation and maintaining the sewer system so that the system is available to collect wastewater from the parcel when service is activated. Parcels with shutoff water meters will continue to pay base monthly service fee since sewer service is available and may be activated and used by the property owner at any time. The sewer base service charge will be based on the water meter size. In the absence of a City water meter, the Customer Service Director will determine the appropriate sewer base service charge.

Sewer volume charges are based on water consumption as determined in Section 7-02-001-0045 and will be billed monthly per 1,000 gallons of water consumption.

Sewer only service customers will be charged a monthly **BASE** service fee and sewer usage **VOLUME** charge based on estimated water consumption as approved by the **Water Services CUSTOMER SERVICE** Director. If the **CUSTOMER SERVICE** Director determines that adequate water meter information is not available for billing a residential customer as described above, then the customer will be charged the average monthly billing for that user class.

Customer Classes	Monthly Rate				
	7/1/16	1/1/17	1/1/18	1/1/19	1/1/20
Residential:					
Single-family	\$4.07	\$4.36	\$4.67	\$5.00	\$5.35
Multiple and mobile home (per unit)	\$4.07	\$4.36	\$4.67	\$5.00	\$5.35
Nonresidential:					
Car washes	\$4.09	\$4.38	\$4.69	\$5.02	\$5.38
Laundromats	\$4.20	\$4.50	\$4.82	\$5.16	\$5.53
Commercial	\$4.31	\$4.62	\$4.95	\$5.30	\$5.68
Hotels, motels	\$5.76	\$6.17	\$6.61	\$7.08	\$7.58
Restaurants	\$6.92	\$7.41	\$7.93	\$8.49	\$9.09
Industrial laundries	\$6.36	\$6.81	\$7.29	\$7.81	\$8.36
Manufacturing plants	\$4.63	\$4.96	\$5.31	\$5.69	\$6.09
Pet food manufacturers	\$10.15	\$10.87	\$11.64	\$12.46	\$13.34
Soft drink bottlers	\$8.04	\$8.61	\$9.22	\$9.87	\$10.57
Ice cream cone manufacturers	\$12.56	\$13.44	\$14.39	\$15.40	\$16.48
Northern Arizona University	\$3.73	\$4.00	\$4.28	\$4.58	\$4.91

**MONTHLY BASE SERVICE CHARGE**

<u>Meter Size</u>	<u>09/01/2024</u>	<u>01/01/2026</u>	<u>01/01/2027</u>	<u>01/01/2028</u>	<u>01/01/2029</u>
<u>3/4"</u>	<u>\$10.03</u>	<u>\$12.04</u>	<u>\$13.24</u>	<u>\$13.90</u>	<u>\$14.60</u>

<u>1"</u>	<u>\$16.75</u>	<u>\$20.10</u>	<u>\$22.11</u>	<u>\$23.22</u>	<u>\$24.38</u>
<u>1 1/2"</u>	<u>\$33.40</u>	<u>\$40.08</u>	<u>\$44.09</u>	<u>\$46.29</u>	<u>\$48.60</u>
<u>2"</u>	<u>\$53.46</u>	<u>\$64.15</u>	<u>\$70.57</u>	<u>\$74.10</u>	<u>\$77.81</u>
<u>3"</u>	<u>\$117.05</u>	<u>\$140.46</u>	<u>\$154.51</u>	<u>\$162.24</u>	<u>\$170.35</u>
<u>4"</u>	<u>\$167.20</u>	<u>\$200.64</u>	<u>\$220.70</u>	<u>\$231.74</u>	<u>\$243.33</u>
<u>6"</u>	<u>\$334.30</u>	<u>\$401.16</u>	<u>\$441.28</u>	<u>\$463.34</u>	<u>\$486.51</u>
<u>8"</u>	<u>\$534.90</u>	<u>\$641.88</u>	<u>\$706.07</u>	<u>\$741.37</u>	<u>\$778.44</u>

**VOLUME CHARGE - \$ PER 1,000 GALLONS**

	<u>09/01/2024</u>	<u>01/01/2026</u>	<u>01/01/2027</u>	<u>01/01/2028</u>	<u>01/01/2029</u>
<b><u>RESIDENTIAL:</u></b>					
<u>Single Family and Multi-Family</u>	<u>\$5.28</u>	<u>\$6.34</u>	<u>\$6.97</u>	<u>\$7.32</u>	<u>\$7.69</u> <del>8</del>
<b><u>NON-RESIDENTIAL (*):</u></b>					
<u>NON-RESIDENTIAL A</u>	<u>\$4.36</u>	<u>\$5.23</u>	<u>\$5.75</u> <del>6</del>	<u>\$6.04</u>	<u>\$6.34</u> <del>5</del>
<u>Includes: Car Washes, Commercial, Hotels/Motels, Institutional, Laundromats, Manufacturing, Schools</u>					
<u>NON-RESIDENTIAL B</u>	<u>\$6.79</u>	<u>\$8.15</u>	<u>\$8.97</u> <del>6</del>	<u>\$9.42</u> <del>4</del>	<u>\$9.89</u> <del>8</del>
<u>Includes: Industrial Laundries, Pet Food Manufacturers, Restaurants</u>					
<u>NON-RESIDENTIAL C</u>	<u>\$28.23</u>	<u>\$33.88</u>	<u>\$37.27</u> <del>6</del>	<u>\$39.13</u>	<u>\$41.09</u> <del>8</del>
<u>Includes: Ice Cream Cone Manufacturers</u>					
<u>(*) New customer types not listed above will apply to the Water Services Director to establish their rate.</u>					

<b>Customer Classes</b>	<b>Monthly Rate</b>				
	<b>7/1/16</b>	<b>1/1/17</b>	<b>1/1/18</b>	<b>1/1/19</b>	<b>1/1/20</b>
Waste haulers (charge per 1,000 gallons)	\$80.00				
<u>SCAVENGER WASTES –</u> Restaurant grease (charge per 100 gallons)	\$11.00				
<u>SCAVENGER WASTES –</u> <u>SEPTAGE</u> Other treatment plant sludge (charge per 100 gallons)	\$8.00	\$11.00			

Customer Classes	Monthly Rate				
	7/1/16	1/1/17	1/1/18	1/1/19	1/1/20
<u>SCAVENGER WASTES</u> – Mud sump waste (charge per 100 gallons)	\$25.00	<u>\$31.00</u>			
Waste material <u>SCAVENGER WASTES</u> delivered to the treatment plant at times other than <u>SPECIFIED IN THE SCAVENGER WASTE PERMIT.</u> 8:00 a.m. to 4:00 p.m. Weekends or holidays shall be assessed an after hours fee of:	\$35.00	<u>\$146.00</u>			
Sewer surcharges:					
Biochemical oxygen demand - per pound concentrations over 300 milligrams per liter	<del>\$.2703</del>	<u>\$0.421</u>			
Suspended solids - per pound for concentrations over 350 milligrams per liter	<del>\$.1343</del>	<u>\$0.292</u>			

If a customer's discharge exceeds the BOD and TSS limit already included in the monthly rate calculation for that customer class listed above, then sewer surcharges may be added as a condition to the customer user permit, compliance agreement or administrative order. ANY SURCHARGES IMPOSED BY THIS CHAPTER SHALL BE BASED ON THE AVERAGE OF ALL SAMPLING CONDUCTED DURING THE APPLICABLE BILLING PERIOD OVER THE TOTAL FLOW FOR SUCH PERIOD.

BOD and TSS included in monthly rates for specific customer classes are as follows:

Customer Class	BOD mg/L	TSS mg/L
Car Washes	20	150
Laundromats	150	110
Commercial	200	175
Manufacturing	200	175
Pet Food Manufacturers	<del>1,800</del> <u>700</u>	<del>1,100</del> <u>525</u>
Soft Drink Bottlers	1,800	400
Ice Cream Cone Manufacturers	9,700	100

All customers served directly by the City and located outside the City limits shall pay at a rate of one hundred ten percent (110%) times the rate for the same classification of service inside the City.

In the case of one (1) meter serving a user that has different classifications of business, the Director shall be authorized to adjust the rate per one thousand (1,000) gallons based upon the contribution of each classification.

The user shall be determined according to customer class OR WASTEWATER SOLIDS CHARACTERISTICS (see rate schedule above).

B. Capacity Charges.

1. A capacity charge, as prescribed below, shall be assessed upon:
  - a. Initial connection to the municipal sewer system; or
  - b. Any subsequent expansion or modification of the user's building or facility which results in an increased contribution to the sewer system from:
    - (i) For single- or multifamily residential users, an increase in the number of residential units, or
    - (ii) For commercial or industrial users, an increase in the number of fixture units, ~~or~~
    - (iii) ~~For industrial users, any change in operations resulting in a twenty percent (20%) or greater increase in billable volume as measured on an annual basis, or~~
    - (iv) ~~A change of use of the property whereby an increased volume of discharge to the sewer system occurs.~~
  - c. Size of water meter installed on the property.
  - d. Each additional water meter added will require additional sewer capacity fees unless specifically designated as a landscape meter.
2. The capacity charges for the various types of users are as follows:
  - a. Customer (capacity) charge, dollars.
  - b. Residential.
  - c. Single-family residential and townhomes (per unit):

EFFECTIVE <del>7-1-16</del> <u>09-01-2024</u>	<del>\$3,723</del> <u>\$4,086</u>
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  - d. Multiple residential, condos and mobile home (per unit):

EFFECTIVE <del>7-1-16</del> <u>09-01-2024</u>	<del>\$3,723</del> <u>\$4,086</u>
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When a change of use occurs that increases the volume of discharge to the sewer system, regardless of whether a change in ownership has taken place, the capacity charge shall be based on the capacity charge for the new use less the existing capacity

charge rate for the previous use. No refund shall be made in the case of reduced volume of discharge from a change of use.

Nonresidential:

Meter size	EFFECTIVE 7/1/16
	<u>09/01/2024</u>
5/8" or 3/4"	\$3,723 <u>\$4,086</u>
1"	\$6,218 <u>\$6,824</u>
1-1/2"	\$12,399 <u>\$13,608</u>
2"	\$19,845 <u>\$21,780</u>
3"	\$37,233 <u>\$40,863</u>
4"	\$62,068 <u>\$68,120</u>
6"	\$124,099 <u>\$136,198</u>
8"	\$198,566 <u>\$217,927</u>
10"	\$285,468 <u>\$313,302</u>

\*gallon per day of estimated flow

THE ABOVE LIST IS THE MINIMUM CAPACITY CHARGE FOR EACH METER SIZE, FLOWS AND LOADINGS EXCEEDING 0.67 POUNDS PER DAY FOR NEW CONNECTIONS, AS DETERMINED BY THE WATER SERVICES DIRECTOR, WILL BE MULTIPLIED BY \$10.94 PER GALLON AND \$1.891 PER POUND TO DETERMINE THE CAPACITY FEE FOR ANY METER SIZE.

~~Where the capacity charge is based on volume, said charge will initially be calculated based on an estimate of flowage to be submitted in writing by the customer and agreed upon by the City. The capacity charge will be adjusted based upon the volume of the highest consecutive twelve (12) month period for the thirty-six (36) months immediately following commencement of service for assessment of an additional capacity charge.~~

~~The Division shall review all industrial user accounts on an annual basis and assess an additional capacity charge when the annual average billable volume increased by twenty percent (20%) or more. The charge is calculated at the current volume less previously assessed capacity charge recalculated at then current rates.~~

~~Wastewater capacity associated with similar user classes may be transferred from one (1) location to another with the approval of the Division. The location from which the wastewater capacity was transferred shall be without wastewater capacity until a subsequent purchaser of said location establishes a new capacity and fees for the new use. The transferor of the wastewater capacity is required to notify any subsequent purchaser of the property, which no longer has wastewater capacity, that such capacity does not exist. The City shall record an agreement between the transferor and the City with the County Recorder against the property without wastewater capacity rights. The agreement shall reference the legal description of the property without wastewater capacity and clearly indicate that wastewater capacity rights do not exist.~~

~~Exemption and Payment of Capacity Charges. Structures with a minimum of stem wall, and first floor existing on December 1, 1979, shall be exempt from the capacity charges. As of that date, the capacity charge is immediately due and payable upon receipt of an application for connection to the sewerage system.~~

If connection is made to the sewerage system without appropriate permit, the capacity charge is immediately due and payable upon the earliest date that such permit was required. No connection to the sewerage system shall be made without the proper permit and payment of the capacity charge except as provided below for installment payments.

C. Capacity Fee Installment Payments. Capacity fees may be paid for by installment payments in accordance with the following conditions:

1. A capacity fee that totals an amount greater than one hundred fifty thousand dollars (\$150,000.00 100,000.00) may be paid as follows:

a. No less than one-third (1/3) of the total capacity fee due is to be paid upon receipt of the application for connection to the sewerage system.

b. The balance due of the capacity fee is to be paid in equal monthly installments over no more than thirty-six (36) months to include an interest rate calculated to be the prime rate + 1/2% at the time of the application.

c. The customer agrees to secure the balance due to the City by a letter of credit drawn in favor of the City, or in any other form of security satisfactory to the City Manager, City Attorney and Finance MANAGEMENT SERVICES Director.

~~2. For industrial capacity fees greater than twenty five thousand dollars (\$25,000.00) the City Council may consider reduced initial payments and/or extended time periods for payment. Consideration shall be based on the following criteria and other criteria the City Council may wish to include:~~

~~a. Economic impact.~~

~~b. Community impact.~~

~~c. Environmental impact.~~

~~d. Desirability.~~

~~e. Financial viability.~~

~~3. Requests for reduced initial payments and/or extended time periods for the payment of industrial sewer capacity fees shall be made in writing to the City Water Services Director for consideration by the City Council. Requests shall address the aforementioned criteria and shall be subject to the following:~~

~~a. No less than twenty five thousand dollars (\$25,000.00) of the total capacity fee is due to be paid upon receipt of the application for connection to the sewerage system.~~

b.—The balance of the capacity fee shall be paid in equal monthly installments for a period of up to thirty (30) years as requested by the industrial customer and approved by the City Council. A written agreement shall be executed between the City and the customer which shall include an interest rate as recommended by the City Manager and City Treasurer and approved by the City Council of the application.

c.—The industrial customer agrees to secure the balance due to the City by a letter of credit drawn in favor of the City or in any form of security satisfactory to the City Treasurer.

D.—Special Rules for Application of Surcharges. The following special rules shall pertain in applying the surcharges described in Section 7-02-001-0040(H) and subsection (A) of this section:

1.—Biochemical Oxygen Demand.

a.—In the event that an industrial user's wastewater shall exhibit concentrations of BOD exceeding four hundred (400) mg/L, then the surcharge for concentrations from four hundred (400) mg/L to five hundred (500) mg/L shall be multiplied by two (2);

b.—In the event that an industrial user's wastewater shall exhibit concentrations of BOD exceeding five hundred (500) mg/L, then the surcharge for concentrations from four hundred (400) mg/L to five hundred (500) mg/L shall be multiplied by two (2), and the surcharge for concentrations of BOD exceeding five hundred (500) mg/L shall be multiplied by three (3).

2.—Total Suspended Solids.

a.—In the event that an industrial user's wastewater shall exhibit concentrations of TSS exceeding four hundred fifty (450) mg/L, then the surcharge for concentrations from four hundred fifty (450) mg/L to five hundred fifty (550) mg/L shall be multiplied by two (2);

b.—In the event that an industrial user's wastewater shall exhibit concentrations of TSS exceeding five hundred fifty (550) mg/L, then the surcharge for concentrations from four hundred fifty (450) mg/L to five hundred fifty (550) mg/L shall be multiplied by two (2), and the surcharge for concentrations of TSS exceeding five hundred fifty (550) mg/L shall be multiplied by three (3).

3.—All surcharges imposed by this chapter shall be based on the average of all sampling conducted during the applicable billing period over the total flow for such period.

## 7-02-001-0042 SCAVENGER WASTE AND GREASE HAULERS

A. "Scavenger waste" is defined as sewage or human excreta that is removed from a septic tank or other on-site wastewater treatment facility, privy, sewage vault, river can, rocket can, or fixed or transportable chemical toilet or other similar units.

B. "Grease" is defined as fats, oils and grease (FOG); organic polar compounds derived from animal and/or plant sources as detectable in cooking oils, food scraps containing grease, butter or oil, lard or tallow, meat fat, grease and juices, gravies, sauces, shortening and dairy products.

C. Authorized Scavenger Waste Haulers. Only scavenger wastes generated within Coconino County shall be authorized to discharge into the sewerage system.

1. The Water Services Director shall require haulers of scavenger waste to obtain a scavenger waste discharge permit FOR EACH VEHICLE THAT HAULS WASTES TO THE TREATMENT PLANT.
2. Septage haulers shall not discharge mixed loads of grease and septic tank or scavenger waste or any other type of waste. Scavenger waste haulers may discharge loads only at locations designated by the Director and at such times as are established by the Director. The Director may collect samples of each hauled load to ensure compliance with applicable standards. The Director may require the scavenger waste hauler to provide a waste analysis of any load prior to discharge. The discharge of hauled septic tank waste is subject to all other requirements of this chapter.
3. The Director shall establish hours for operation and acceptance for discharging of scavenger waste. The hours of operation shall be available on the Flagstaff Water Services website and posted at the entrance gate of the water reclamation plant.
4. Septage haulers are required to weigh in before and after discharging to the water reclamation plant or POTW, provided a scale is available.
5. Discharge of scavenger waste at hours other than those established by the Director shall be at the discretion of the plant operator and will be subject to a fee set forth in Section 7-02-001-0041 ~~3-10-001-0008~~. Scavenger waste haulers must provide a completed City waste-tracking or manifest form for every load, prior to entering the water reclamation plant. This form shall include, at a minimum, the name and address of the waste hauler, permit number, truck identification, names, addresses and phone number of sources of waste, and volume and characteristics of waste. Scavenger waste haulers shall maintain records of all waste-tracking or manifest forms for at least five (5) years.

D. Authorized Grease Haulers. Grease will only be accepted for discharge into the designated grease receiving station from generators that have written acceptance by the Director and will be subject to the following conditions:

1. The Director shall require grease haulers to obtain a scavenger waste discharge permit FOR EACH VEHICLE THAT HAULS WASTES TO THE TREATMENT PLANT.
2. Grease haulers shall not discharge mixed loads of grease and septic tank or scavenger waste or any other type of waste. Grease haulers may discharge loads only at locations designated by the Director and at such times as are established by the Director. The Director may collect samples of each hauled load to ensure compliance with applicable standards. The Director may require the grease hauler to provide a waste analysis of any load prior to discharge. The discharge of hauled grease is subject to all other requirements of this chapter.
3. The Director shall establish hours for operation and acceptance for discharging of grease. The hours of operation shall be available on the Flagstaff Water Services website and posted at the entrance gate of the water reclamation plant.

4. Grease haulers are required to weigh in before and after discharging to the water reclamation plant or POTW, provided a scale is available.
5. Discharge of grease at hours other than those established by the Director shall be at the discretion of the plant operator and will be subject to a fee set forth in Section 7-02-001-0041 ~~3-10-001-0008~~.
6. Grease haulers must provide a completed City waste-tracking or manifest form for every load, prior to entering the water reclamation plant. This form shall include, at a minimum, the name and address of the grease hauler, permit number, truck identification, names, addresses and phone number of sources of waste, and volume and characteristics of waste. Grease haulers shall maintain records of all waste-tracking or manifest forms for at least five (5) years.

#### **7-02-001-0042.1 SCAVENGER WASTE DISCHARGE PERMITS**

A. All authorized persons or companies, as defined in Section 7-02-001-0042, wishing to discharge scavenger wastes or grease must first obtain a scavenger waste discharge permit for each vehicle that will haul scavenger waste or grease from the Director. Vehicle permit applications shall be provided by the City and must include the following information:

1. Business name;
2. Business phone number;
3. Name of business owner or responsible party;
4. Business physical location;
5. Business mailing address;
6. Business email address;
7. Name(s) of operator(s);
8. Operator phone number(s);
9. Vehicle information:
  - a. Year/make/model;
  - b. License plate number/state;
  - c. Tank capacity;
  - d. Type of hauled waste(s);
  - e. ADEQ license number.
10. Any additional information as required to meet applicable Federal and/or State regulations or as deemed necessary to prevent incidences of overloading, interference or

pass-through at the water reclamation plant and/or interference, damage, etc., to the wastewater collection systems.

B. The permit provided for in this section shall be issued by the Director to all applicants who comply with the terms and conditions set forth in this section as follows:

1. For each vehicle utilized for the transportation of scavenger wastes or grease for disposal into the sewerage system, payment or prorated portion of the annual fee as established per City Code Section 3-10-001-0008, License Fees.
2. Once permits are obtained, all waste haulage equipment operated by companies with permits shall be registered with the Management Services Division and shall submit documentation that fee has been paid and shall be identifiable by display of the license plate number.
3. The permit issued as provided for in this section shall expire January 2nd of each year and not more than one (1) year after the date of issue. It shall be the responsibility of the hauler to seek renewal of their permit, at least thirty (30) days prior to the expiration date.
4. Noncompliance with any part of this section or subsequent regulations shall subject the permit holder to revocation of permit to utilize the services of the City sewerage system for disposal of scavenger wastes or grease. Reissuance of permit to discharge after revocation shall be at the discretion of the Director and may be subject to such conditions as deemed appropriate.
5. The Director may establish regulations as are deemed necessary to control the discharge of scavenger wastes so as to prevent incidences of overloading, interference or pass-through at the water reclamation plant and/or interference, damage, etc., to the wastewater collection systems. All discharges shall comply with the prohibited substances restrictions set forth in Section 7-02-001-0007.
6. The water reclamation plant does not accept hazardous waste as defined by the Resource Conservation and Recovery Act and the Code of Federal Regulations.
7. The waste hauler will be financially responsible for any damage to or interference with the publicly owned treatment works (POTW), or for any expense to the City (including testing) caused by the discharge from the hauler. The waste hauler and/or generator will be charged for all expenses in monitoring and handling their discharge.
8. Waste haulers may not discharge unless a plant operator is present and has approved the discharge. The operator may refuse to accept any discharge if it is suspected to contain wastes which are considered unacceptable to the City water reclamation plants.
9. The waste hauler shall have sampling taps or outlets (as approved by the Water Services Division) on each truck for proper sampling of contents. The waste hauler shall be subject to random sampling/monitoring by the City.
10. Waste haulers will position their trucks at the direction of the plant operator to prevent spills. Any traces of the hauler's discharge must be removed by the hauler immediately.

11. Waste haulers shall not bypass any control device while discharging to the City Water Reclamation Plant or POTW.

12. Waste haulers cleaning trucks at the water reclamation plant shall be subject to a truck clean out fee set forth in Section 3-10-001-0008. Truck shall be empty prior to clean out. Septic tank and scavenger waste haulers shall be subject to the enforcement guides set forth in Section 7-02-001-0019.

13. Provision of false information by either the generator or the hauler shall also be considered a violation of this code and subject to the provisions of Sections 7-02-001-0017 and 7-02-001-0019.

C. The Director may revoke a permit for any of the following actions or inactions by the permittee:

1. Disposing hauled waste at any location not designated or approved by the Director.
2. Misrepresenting or failing to fully disclose all relevant facts in the waste hauler discharge permit application.
3. Falsifying information provided on waste tracking forms or waste disposal manifests.
4. Failure to provide a waste tracking form or waste disposal manifest.
5. In the event that the City implements an electronic or web-based waste tracking form or waste disposal manifest reporting system, all reports shall be submitted on this system.
6. The hauler shall be responsible for any fees associated with an electronic or web-based reporting system.
7. Tampering with samples collected from waste loads.
8. Refusing to allow the Director timely access to the facility premises or records.
9. Failing to meet effluent requirements.
10. Failing to pay fines or penalties.
11. Failing to pay waste disposal charges.
12. Failing to complete a waste hauler discharge permit application.
13. Violating any general or specific permit condition or requirement, or any terms of the waste hauler discharge permit or this section.

#### **7-02-001-0043 SEWER RATES TO BE ADDED TO WATER BILLS**

All sewer user charges to be added to and collected with the bills as rendered for water by the ~~Finance~~ **CUSTOMER SERVICE** Section, and all of the rules and regulations promulgated by the ~~Finance~~ **MANAGEMENT SERVICES** Director shall apply to, and be effective in, the collection of such sewer service charges.

**7-02-001-0044 WHEN BILLS PAYABLE; DISCONNECTION OF SERVICE FOR FAILURE TO PAY; RECONNECTION FEE**

All bills for sewer service shall be due and payable on the billing dates of the various districts, and if not paid within thirty (30) days thereafter will be considered delinquent and the sewer service may be discontinued without notice. In the event extraordinary costs are incurred by the City to discontinue the sewer service, such costs shall be paid by the customer before service is continued.

**7-02-001-0045 DETERMINATION OF WASTEWATER QUANTITY VOLUME CHARGE AND BILLINGS: NONRESIDENTIAL**

A. In the absence of suitable data to make a determination for nonresidential users as to the amount of water discharged to the sewer system, the sewer ~~user~~ VOLUME charge shall be based on the amount of water supplied to the premises. The Director may require or permit the installation of acceptable additional water or sewer meters at such party's expense and in such a manner as to determine the quantity of water actually entering the sewer system, in which case, the quantity of water used to determine the sewer charge shall be the quantity of water actually entering the sewer system as so determined. The meter (or meters) must measure the total flow unless another method has been approved by the City.

B. It shall be the responsibility of each user, who chooses or is required to perform the purchase and installation of such meters, to notify and gain approval of the City Water Services Division. Upon initial written verification, by a qualified individual, that the meter has been installed and is functioning accurately and efficiently, the user assumes daily operation and maintenance of such meters.

If at any time, the Division determines that such meter is insufficient for the purpose it is intended, whether because of inability to repair, increased discharge rate of waste stream, etc., the user shall replace the meter or have modifications performed to the existing meter, at the user's expense and in such a way that is considered satisfactory to the City Water Services Director.

C. All significant industrial users shall have a City approved sewer flow meter or other City approved means of measuring their effluent. This meter shall be equipped to provide a permanent record of the flow measurements. All records of the flow shall be kept for a minimum of three (3) years and must be available to the City.

D. It shall be the responsibility of all industrial users who are required or choose to install flow measurement devices to provide a security system which would provide the City with unrestricted access to such meter, yet at the same time provide protection from user access unauthorized by the City, tampering, vandalism, the elements or any other factor which may inhibit accurate flow measurement of the waste stream.

E. The industrial user shall keep their wastewater collection lines free from debris, turbulence or any other entity that may inhibit the accurate measurement of sewer flow.

**RESIDENTIAL:**

- A. Sewer user VOLUME charge shall be based on the average monthly water billed to each customer during the preceding December, January, February and March and shall represent sewage flow for full-time residential customers.
- B. If the Director determines that adequate water meter information is not available for billing a residential customer as described above, then the customer shall be charged the average monthly billing for that user class.
- C. Upon approval of the Director, any individual user may, at his own expense and subject to the regulations of the Division, install a separate meter in order to determine the quantity of water actually entering the sewer system and future sewer charges shall be limited to that water actually entering the sewer system as so determined by the Director.
- D. If, within ten (10) days of billing, a customer files a written complaint with the Director alleging that a significant portion of his water usage does not enter the sewer system, the Director, in accordance with written appeals procedure, shall provide an opportunity for the customer to present THEIR his supporting documentation to an employee designated by the Director to hear complaints.
- E. Upon approval of the Director, metered water usage may be used to determine the sewer use charge when it can be shown to be more accurate than using the average winter water usage.

#### **7-02-001-0046 PAYMENT OF BILLS AND CHARGES**

- A. All notices sent out by the City regarding sewer user accounts, and all notices regarding any other matter pertaining to the user of the City sewer system, shall be sent to the house and street number of such property. To ~~insure~~ ENSURE proper delivery of notices, all errors in house numbers should be promptly reported to the Finance CUSTOMER SERVICE Section.
- B. The sewer account and bill shall distinguish the amount of the sewer user charge from any industrial cost recovery charge, if applicable.
- C. All rates and service charges are payable when rendered and shall be paid by the due date. If the total of such bill is not received by the City within five (5) days after the due date the consumer shall be charged an additional five dollar (\$5.00) nonrefundable late payment penalty fee. Consumers on a payment plan that has been approved by the Water Services Division may be exempted from the late payment penalty fee.

All charges shall be considered delinquent thirty (30) days after bill date. If the total of such bill is not paid within ten (10) days after the date of delinquency (thirty (30) days from bill date), a notice may be placed at the service address notifying of the past due amount and service charge which must be paid within twenty-four (24) hours. After twenty-four (24) hours, the water or sewer service may be disconnected from the premises of the delinquent consumer. The total amount of the bill due and any deposit, if such deposit is required, shall be collected before again providing sewer service or water service. Any closed, delinquent account requiring special collection effort may be assessed a delinquent collection charge to cover the additional cost as established by the Finance CUSTOMER SERVICE Director.

D. A consumer's water or sewer service may be disconnected for nonpayment of a bill for service rendered at a previous location served by the City, provided such bill is not paid within thirty (30) days after the unpaid bill has been presented to the consumer at his new location.

E. Any expense caused to the City for the repair or replacement of damaged, stolen, tampered with or misused sewer or water facilities shall be charged against and collected from the person or persons who caused the expense.

F. When a user of the water or sewer system has been notified of the amount of charges remaining due after the deduction of THEIR his security deposit, and payment for same has not been received, the Finance CUSTOMER SERVICE Director may assign the account to a bona fide collection agency.

G. Before water or sewer service will be turned on to any premises all charges against the premises when due and payable to the City as required by this chapter, or including any of the following items must have been paid: on account of labor supplied or materials furnished by the Water Services Division in the installation of service pipes connecting the premises with the City sewer mains, or for tapping the City sewer system; on account of water or sewer service previously supplied to the premises; whether used by the applicants or by some previous occupant of the premises; or on account of the assessment of any fine or penalty; or for turning water or sewer services off or on; or for repair or replacement of damaged, stolen or misused sewer works facilities.

#### **7-02-001-0047 NOTICE PRIOR TO DISCONNECT**

Before discontinuing water or sewer service for nonpayment of any sewer user charge, deposit or other assessment provided for in this chapter, the Finance CUSTOMER SERVICE Director shall give written notice to the person of the discontinuance and an opportunity to appear before the Finance CUSTOMER SERVICE Director or his designee on any disputed matter relative to the discontinuance of sewer service.

#### **7-02-001-0048 SERVICE CONNECTIONS**

Every separate building to be provided with sewer service shall have its own separate sewer service connection to the City sewer main, except that two (2) or more buildings located on the same lot or on contiguous lots under the same ownership or property known as a court, apartment house or block covering more than one lot, may be provided sewer service through the same connection as long as the single ownership continues. Upon change from such single ownership, a new and separate connection shall be immediately made for the building or premises to replace the indirect connection. No person having sewer service shall provide sewer service to any other sewer user, whether gratuitously or for a charge.

#### **7-02-001-0049 PERMITS REQUIRED FOR INDUSTRIAL USERS**

All significant industrial users, as defined by Section 7-02-001-0009(A)(1), shall obtain a permit for connection and discharge or any modification that changes the treatment, production, flow, etc., of the existing facility to the City's sewer system from the Director.

#### **7-02-001-0050 INDUSTRIAL USER PERMITS**

A. The significant industrial user shall make application for such permit, at least ninety (90) days prior to commencement of discharge, on a form provided by the Director. An applicant shall pay a fee as determined by the City of Flagstaff for each application and thereafter be issued an industrial pretreatment discharge permit which shall be valid for a period of five (5) years from the date of issuance or less as determined by the Director.

**Industrial Pretreatment Discharge Permit Fee**

(Effective <del>1-1-07</del> <u>09/01/2014</u> )	(Effective <del>1-1-08</del> )	(Effective <del>1-1-09</del> )	(Effective <del>1-1-10</del> )
\$100 per year <u>\$1,950.00 FOR 5 YEARS</u>	\$150 per year	\$200 per year	\$250 per year

B. Upon expiration of such permit, an applicant who holds a valid wastewater discharge permit and is in compliance with the terms and conditions established by this chapter shall file an application for renewal of an industrial pretreatment discharge permit, at least ninety (90) days prior to the expiration date of the previous permit, together with the existing fee and, thereafter, shall be issued a renewed industrial pretreatment discharge permit, which shall be valid for a period of five (5) years from the date of issuance of the renewal or less as determined by the Director.

C. The applicant shall submit the information contained in subsections (D) through (G) of this section and any other information requested by the City at the time of submittal, or the application will be rejected and the applicant required to resubmit with the appropriate fee.

D. An applicant seeking an industrial pretreatment discharge permit or renewal shall submit, as part of its application, the results of an analysis, compliant with standard methods, conducted by a laboratory certified by the State of Arizona Department of Health Services, of a representative daily composite sample of the effluent discharge from the applicant's plant.

E. An applicant shall submit as part of its application for a permit a discharge report which includes, but not be limited to, the nature of process, volumes, rates of flow, production quantities, concentrations in the wastewater discharge and any other information that may be relevant to the generation of waste.

F. An applicant, as part of its application for a permit, shall submit a plan showing the location and size of on-site sewers, sampling point, pretreatment facilities, City sewers and any other pertinent physical details.

G. An applicant as part of its application for a permit shall list each product manufactured, the type, amount and rate of production and the chemical components and quantity of liquid or gaseous materials stored on site, even though they may not normally be discharged into the sewer system.

H. In the event a producer of industrial waste which is authorized to make a connection to the City sewer for pretreated industrial waste disposal under the provisions hereof is sold, leased, or its operation is assumed or taken over by another person, firm or corporation other than that named in the permit, a new application for a permit shall be made by the new owner, lessee or operator. No permit issued under the provisions hereof shall be assignable and a violation of

this provision shall be grounds for summary suspensions or revocation of such permit by the Director.

I. It shall be a condition of the permit that the City may at any time test any of the wastes being discharged by the company or plant for quality or quantity. A duly authorized City representative may enter the permittee's premises at any time during business or operational hours for the purpose of inspecting plant operations to estimate quality or quantity of wastes.

J. It shall be a condition of the permit that the permittee shall install facilities, approved by the City Engineer at the permittee's expense for the purpose of the City's representative inspecting, observing and sampling representative flows in accordance with Section 7-02-001-0015.

K. It shall be a condition of the permit that additional periodic reports as may be required by the Director to properly monitor the discharge of the industrial wastes, be submitted to the Director.

L. Issuance of an industrial pretreatment discharge permit shall not release the permit holder from the obligation to comply with all other provisions of this chapter.

M. The City may change the conditions of any permit in order to comply with requirements of Federal or State regulations. An industrial user may petition the Director to modify their permit for monitoring parameters or process changes. The user must submit sampling reports and/or documentation to support their petition.

#### **7-02-001-0051 PERMITTEE REQUIREMENTS**

A. Each permittee shall provide protection from accidental discharge of prohibited materials or other wastes regulated by this chapter. If such discharge may occur, permittee must report it to the Water Services Director as described in Section 7-02-001-0011.

B. In order that officers, agents and employees of permittees will be informed of the City's requirements, permittees shall make available to their employees copies of this chapter together with such other wastewater information and notices which may be furnished by the City from time to time for the purposes of improving and making more effective water pollution control. A notice shall be furnished and permanently posted on the permittee's bulletin board advising officers, agents and employees who to call in case of an accidental discharge in excess of the limits authorized by the permit.

C. Any possible connection or entry point for a hazardous and/or prohibited substance to the permittee's plumbing or drainage system shall be appropriately labeled to warn operating personnel against discharge of such substances.

#### **7-02-001-0052 SEWER SERVICE OUTSIDE CITY LIMITS**

A. For all places outside the corporate limits of the City not mentioned in this chapter where sewer service is rendered by the City, and for which no rate is specifically fixed, the rate to be charged, including a connection charge, shall be as fixed by the City Council.

B. City sewer service offered to users outside the City limits shall be offered by the City subject to compliance by the users with the terms of this chapter.

## **7-02-001-0053 DISCONNECTION OF SERVICE**

The violation of any section of this chapter shall be sufficient cause for the City to discontinue water or sewer service to any premises, and such service shall not be restored until such violations have been discontinued or eliminated and all outstanding charges paid. The discontinuance of sewer service shall be accomplished by physically cutting and blocking the building connection. A charge for disconnecting and reconnecting shall be paid to the Finance CUSTOMER SERVICE Section for reconnecting the sewer service.

PART 3: WATER REGULATIONS

**CHAPTER 7-03  
CITY WATER SYSTEM REGULATIONS**

SECTIONS:

7-03-001-0001	APPLICATION FOR CONNECTION
7-03-001-0002	APPLICATION FOR SERVICE
7-03-001-0003	DEPOSIT REQUIRED
7-03-001-0004	CONNECTION FEES
7-03-001-0005	SERVICE CHARGES
7-03-001-0006	AUTHORITY REQUIRED
7-03-001-0007	MALICIOUS DAMAGE
7-03-001-0008	ACCOUNTS PAYABLE
7-03-001-0009	METERS
7-03-001-0010	WATER RATES
7-03-001-0011	WATER MAIN CAPACITY CHARGES
7-03-001-0012	WATER REVENUE FUND
7-03-001-0013	CITY WATER MAIN EXTENSION POLICY
7-03-001-0014	WATER CONSERVATION
7-03-001-0015	CROSS CONNECTION CONTROL
7-03-001-0016	WATER RESOURCE DEVELOPMENT FEE
7-03-001-0017	PURCHASED ENERGY COMPONENT FOR WATER
7-03-001-0018	RECLAIMED WATER RATE SCHEDULE

**7-03-001-0001 APPLICATION FOR CONNECTION**

Every person requesting connection to the sewer or water system of the City shall first make application to the ~~Utilities~~ **WATER SERVICES** Division on such forms as the City shall prescribe and pay the fees and charges provided for herein. Connection ~~may~~ **SHALL** be made ~~either by the Utilities Division or by a contractor duly licensed by the State of Arizona to perform such work.~~ The work shall be done according to City specifications, and any contractor performing such work shall not cover such connection until the same shall have been inspected and approved by the **WATER SERVICES** ~~Utilities~~ Division.

**7-03-001-0002 APPLICATION FOR SERVICE:**

Every person requesting water service shall make application therefor on such forms as the City may prescribe, and the deposit and charge provided for herein shall be paid before such new service may commence.

**7-03-001-0003 DEPOSIT REQUIRED**

A. Deposit Required. There shall be charged all persons applying for residential water service to be provided to any premises a non-interest bearing deposit of one hundred fifty dollars (\$150.00). There shall be charged all persons applying for nonresidential water service to be provided to any premises a non-interest bearing deposit of three hundred dollars (\$300.00). The deposit must be paid in full at the time of account setup or, if requested by the customer, in three (3) equal installments. If the deposit is paid in installments, the first installment is due at the time of account setup, the next installment will be billed with the first monthly account bill,

and the final installment will be billed with the second monthly account bill. Specific exemption from this provision shall apply to churches, nonprofit community organizations and other utilities. Additionally, persons who have qualified for a deposit refund pursuant to subsection (B) of this section and have no other municipal account delinquency shall be exempt from any deposit requirement or additional or new water service. New customers providing the City with a recent letter from a present or previous utility supplier which shows a good payment history may be exempted from the deposit requirements.

B. Deposit Refund. Except as provided below, a customer shall be entitled to a refund of deposits on hand one (1) year after the required deposit is deposited with the City or when the account is closed. However, in the event a customer fails to make timely payment of a monthly billing, or allows any arrearage to accrue on the customer's account, then the customer shall not be entitled to a refund until the customer has first established a one (1) year record of timely payments with no arrearage. A deposit on a closed account will be refunded, less any amounts owed. No interest shall be paid by the City upon any deposit refund.

**7-03-001-0004 CONNECTION CUSTOMER METER AND WATER TAP FEES**

Any person desiring a connection with any main or lateral of the water or reclaimed water system of the City shall first make application to the City Utilities WATER SERVICES Division, and pay the fees and charges specified for the size of the service desired. All water meters connected to the City water or reclaimed water system are, shall be and shall remain the property of the City. THE SERVICE TO THE CITY'S MAIN IS THE RESPONSIBILITY OF THE APPLICANT'S CONTRACTOR AS SPECIFIED BELOW. Upon payment of the specified fees to the Treasurer by the applicant, the Utilities Division shall, within a reasonable time, make the connection and install the meter. Connection fees shall be:

For Meter Size

5/8" x 3/4"	Cost of meter, fittings and labor, plus overhead
1"	Cost of meter, fittings and labor, plus overhead
1-1/2"	Cost of meter, fittings and labor, plus overhead
2"	Cost of meter, fittings and labor, plus overhead
>2"	Cost of meter, fittings and labor, plus overhead

Connections made by a contractor as provided for in Section 7-3-1 hereof, where service lines have been previously installed and the City is required only to supply and install the meter, shall be subject to the following fees in lieu of the schedule shown above.

For Meter Size (COST OF METER, FITTINGS AND LABOR, PLUS OVERHEAD)

5/8" x 3/4"	<del>\$210.00</del> <u>\$806.00</u>
1"	<del>\$390.00</del> <u>\$972.00</u>
1 1/2"	<del>\$790.00</del> <u>\$1,466.00</u>
2"	<del>\$940.00</del> <u>\$1,703.00</u>
All others	Cost of meter, fittings and labor, plus overhead

For connections and meters larger than two inches (2"), the following deposit must be paid in advance before beginning the connection. Where the deposit is less than the actual cost, the difference will be billed and shall be paid by the applicant prior to service being established for such connection. Where the deposit is more than the actual cost, the difference shall be refunded within a reasonable period of time.

For Meter Size

3"	\$3,000.00
4"	\$4,000.00
6"	\$6,000.00
All others	Cost of meter, fittings and labor, plus overhead

**WATER TAP FEE**

**EACH PERSON, FIRM OR CORPORATION REQUESTING A WATER TAP TO BE INSTALLED BY THE CITY SHALL PAY THE FEE AS HEREBY ESTABLISHED:**

**THREE-QUARTER (3/4) INCH TO TWO (2) INCH WATER TAP: \$350.00.**

**THREE (3) INCH TO TWELVE (12) INCH: \$702.00.**

**ADDITIONAL TAP, SAME TIME, SAME PARCEL, SAME SIZE, 3/4" to 2": \$80**

**ADDITIONAL TAP, SAME TIME, SAME PARCEL, SAME SIZE, 3" to 12": \$160**

**ADDITIONAL TAP, SAME TIME, SAME PARCEL, DIFFERENT SIZE, 3" to 12": \$702**

**PROCEDURES FOR OWNER/CONTRACTOR:**

**OWNER/CONTRACTOR SHALL PAY CAPACITY FEES IF APPLICABLE.**

**OWNER/CONTRACTOR SHALL OBTAIN A PERMIT FROM THE ENGINEERING DIVISION AND PAY A PERMIT FEE BEFORE STARTING EXCAVATION.**

**WHEN NOTIFIED BY ARIZONA 811, WATER SERVICES DIVISION PERSONNEL WILL LOCATE THE WATER MAIN FOR OWNER/CONTRACTOR.**

**OWNER/CONTRACTOR EXCAVATES SITE AND SHORES TRENCH IF NECESSARY, SHORING SHALL BE DETERMINED BY ENGINEERING DIVISION PERSONNEL. OWNER/CONTRACTOR INSTALLS TAPPING SLEEVE AND CORPORATION STOP ON WATER MAIN. ONCE THE TRENCH AND TAPPING SADDLE ARE APPROVED BY THE ENGINEERING INSPECTOR, THE ENGINEERING INSPECTOR WILL SCHEDULE A WATER DISTRIBUTION CREW TO COMPLETE THE TAP.**

**ENGINEERING INSPECTOR INSPECTS THE OWNER/CONTRACTOR'S WORK AND APPROVES IF WORK IS COMPLETED SATISFACTORILY.**

OWNER/CONTRACTOR COMPACTS AND BACKFILLS TRENCH, REPLACES PAVEMENT IF NECESSARY.

FINAL INSPECTION IS DONE BY THE ENGINEERING INSPECTOR.

APPROVAL (PERMIT SIGN-OFF) IS MADE BY THE ENGINEERING INSPECTOR.

OWNER/CONTRACTOR SHALL NOT TAP THE WATER MAIN AT ANY TIME.

All water taps or connections made outside the corporate limits of the City shall be 110% of the above charges, fees and/or deposits.

~~The connection fee for automatic read meters shall include an additional \$130.00 for the meter interface unit and the meter adder.~~

### 7-03-001-0005 SERVICE CHARGES

In addition to the other charges and fees required by this Chapter, the following service charges shall apply:

Description	Service Fee Current	Service Fee 01/01/2011 <u>09/01/2024</u>
<del>New Customer turn-on/off working hours-account activation fee for new customer at existing location</del>	<del>\$24.00</del>	<del>\$24.00</del>
<del>Emergency turn-on/off working hours</del>	<del>\$24.00</del>	<del>\$24.00</del>
<del>New Customer turn-on/off after hours</del>	<del>\$65.00</del>	<del>\$65.00</del>
<u>WATER SERVICE ESTABLISHMENT FEE (NEXT BUSINESS DAY)</u>		<u>\$45.00</u>
<u>WATER SERVICE ESTABLISHMENT FEE (SAME DAY SURCHARGE)</u>		<u>\$20.00</u>
Collection/ Non Payment charge	\$24.00	<del>\$24.00</del> <u>\$45.00</u>
Existing Meter Testing Rate		
Accuracy test (at customer's request) of a meter permanently connected to the water system. The fee is waived if meter testing reveals the meter was reading inaccurately	\$74.00	\$74.00
Backflow Prevention Permit Fee		
Inspection of backflow assembly whose installation has been authorized by permit.		\$87.00
Backflow Compliance Fee		
Additional site visit after customer has failed to correct backflow or reclaimed meter-related deficiencies for which they have received prior written notice. This fee recovers the cost of the additional field visit.		\$87.00

Description	Service Fee Current	Service Fee 01/01/2011 <u>09/01/2024</u>
Unauthorized Connection Fee For illegal service connections made to the public water main. Payable at the time of violation		Twice the System Capacity and Resource Fees
Large Meter Vault – Design Fee for Non-Std City of Flagstaff may provide design and construction documents for the large meter vaults required by the special needs of Developer-required facilities.		Billed at Cost
Perform ADEQ Regulatory Engineering Review and Permitting Services. City of Flagstaff may provide Engineering review and issue permits on behalf of ADEQ under a delegation agreement with ADEQ for water and sewer facilities.		Billed at Current ADEQ Rates in accordance with AAC R18-14-103

**7-03-001-0006 AUTHORITY REQUIRED**

It shall be unlawful for any person to turn on and furnish water or sewer service or authorize or direct another to do so without authority from the ~~Utilities~~ WATER SERVICES Division AND/OR CUSTOMER SERVICE SECTION; and any person violating the provisions hereof shall be guilty of a misdemeanor and incur a penalty in the sum of one hundred-fifty dollars (\$150.00)

**7-03-001-0007 MALICIOUS DAMAGE**

It shall be unlawful for any person intentionally to break, deface, tamper with or damage any meter, hydrant, valve, pipe or other water system appliance or fixture, or in any other manner interfere with the operation of any part of the water system of the City. It shall be unlawful for any person, with intent to injure or defraud, to connect any pipe, tube or other instrument with any main or service pipe for conducting water belonging to the City, for the purpose of taking water from such main or service pipe without the permission or authority of the ~~Utilities~~ WATER SERVICES Division AND/OR CUSTOMER SERVICE SECTION. (Ord. 800, 5-25-71) It shall be unlawful to permit any coupling, pipe, fitting, or tank not dedicated for potable water use to come into contact with public water facility dispensing hoses. Any person violating the provisions hereof shall be guilty of a misdemeanor and incur a penalty in the sum of one hundred-fifty dollars (\$150.00).

**7-03-001-0008 ACCOUNTS PAYABLE**

A. All water accounts charges for water sold and furnished to customers by the City shall be due and payable ~~at the office of the Treasurer~~ TO THE CUSTOMER SERVICE SECTION during regular business hours as established by the ~~Treasurer~~ CITY for the collection of such accounts, Monday through Friday, inclusive, holidays excepted.

B. All water accounts shall be due and payable upon presentation ~~by the office of the Treasurer~~ BY THE CUSTOMER SERVICE SECTION of invoice statement therefor, and shall

become delinquent thirty (30) days thereafter. If such charges are not paid within ten (10) days after such delinquent date, water service may be discontinued without notice and the City may pursue all remedies available at law. The Treasurer CUSTOMER SERVICE DIRECTOR is hereby authorized to consolidate more than one (1) charge for City services into one (1) itemized statement of charges at appropriate billing levels.

C. Any person found in violation of this section shall be guilty of a civil infraction and shall be fined a sum not to exceed five hundred dollars (\$500.00). Any violation which is continuing in nature shall constitute a separate offense on each successive date the violation continues, unless otherwise provided. Any enforcement action is subject to the civil enforcement procedures set forth in Section 1-15-001-0011.

**7-03-001-0009 METERS**

All water furnished or sold by the City shall be delivered or supplied through meter only, and every separate building supplied with City water must have its own separate service connection and meter, except that two (2) or more buildings located on the same lot or on contiguous lots under the same ownership or property known as a court, apartment house or block covering more than one lot, may be supplied through the same connection and meter as long as the single ownership continues. Upon change from such single ownership, a new and separate connection shall be immediately made for the building or premises to replace the in direct connection. No person having a water service connection shall otherwise furnish or deliver water to any other water user, whether gratuitously or for a charge.

**7-03-001-0010 WATER RATES**

There shall be charged the following rates for all water furnished consumers and measured by meter on any service connection with City water mains for and during each monthly billing period.

The base monthly service charge applies whether the water meter is active or inactive. The monthly service charge is based on the fixed cost of operation and maintaining the water system so that the system is available to provide water to the parcel when water service is activated. Parcels with shutoff water meters will continue to pay base monthly service fee since water service is available and may be activated and used by the property owner at any time.

A. Inside City Limits: The following monthly charges shall be effective with bills rendered on and after January 1, 1991.

Applicable sales taxes will be in addition to these charges.

Charge per one thousand (1,000) gallons of measured or estimated water use per month.

**WATER RATE SCHEDULE**

**Monthly Base Service Charge:**

Meter Size	<del>7/1/16</del> <u>09/01/2024</u>	<del>1/1/17</del> <u>01/01/2026</u>	<del>1/1/18</del> <u>01/01/2027</u>	<del>1/1/19</del> <u>01/01/2028</u>	<del>1/1/20</del> <u>01/01/2029</u>
3/4"	<u>\$14.23</u> \$14.01	<u>\$15.65</u> \$14.63	<u>\$17.22</u> \$15.27	<u>\$18.94</u> \$15.94	<u>\$20.83</u> \$16.64

**Monthly Base Service Charge:**

1"	<u>\$18.58</u> \$16.50	<u>\$20.44</u> \$17.22	<u>\$22.48</u> \$17.98	<u>\$24.73</u> \$18.77	<u>\$27.20</u> \$19.60
1 1/2"	<u>\$29.45</u> \$22.71	<u>\$32.40</u> \$23.71	<u>\$35.64</u> \$24.75	<u>\$39.20</u> \$25.84	<u>\$43.12</u> \$26.98
2"	<u>\$42.49</u> \$30.17	<u>\$46.74</u> \$31.50	<u>\$51.41</u> \$32.89	<u>\$56.55</u> \$34.33	<u>\$62.21</u> \$35.84
3"	<u>\$83.80</u> \$47.58	<u>\$92.18</u> \$49.67	<u>\$101.40</u> \$51.85	<u>\$111.54</u> \$54.14	<u>\$122.69</u> \$56.52
4"	<u>\$116.41</u> \$72.43	<u>\$128.05</u> \$75.62	<u>\$140.86</u> \$78.95	<u>\$154.95</u> \$82.42	<u>\$170.45</u> \$86.05
6"	<u>\$290.35</u> \$134.58	<u>\$319.39</u> \$140.50	<u>\$351.33</u> \$146.69	<u>\$386.46</u> \$153.14	<u>\$425.11</u> \$159.88
8"	<u>\$355.57</u> \$209.15	<u>\$391.13</u> \$218.36	<u>\$430.24</u> \$227.97	<u>\$476.26</u> \$238.00	<u>\$520.59</u> \$248.47
10"	<u>\$920.85</u> \$296.16	<u>\$1,012.94</u> \$309.19	<u>\$1,114.23</u> \$322.80	<u>\$1,225.65</u> \$337.00	<u>\$1,348.22</u> \$351.83

**VOLUME CHARGE - \$ PER 1,000 GALLONS**

Monthly Water Use Gallons	Volume Charge \$/1,000 gal				
Single Family - Block Rate	7-1-16	1-1-17	1-1-18	1-1-19	1-1-20
Single Family	<u>09/01/2024</u>	<u>01/01/2026</u>	<u>01/01/2027</u>	<u>01/01/2028</u>	<u>01/01/2029</u>
Tier 1 (0-3,500)	<u>\$4.28</u> \$2.89	<u>\$4.71</u> \$3.02	<u>\$5.18</u> \$3.15	<u>\$5.70</u> \$3.29	<u>\$6.27</u> \$3.44
Tier 2 (3,501-6,200)	<u>\$4.60</u> \$3.75	<u>\$5.06</u> \$3.91	<u>\$5.57</u> \$4.09	<u>\$6.13</u> \$4.26	<u>\$6.74</u> \$4.45
Tier 3 (6,201-11,500)	<u>\$9.19</u> \$5.77	<u>\$10.11</u> \$6.03	<u>\$11.12</u> \$6.29	<u>\$12.23</u> \$6.57	<u>\$13.45</u> \$6.86
Tier 4 (Over 11,500)	<u>\$18.39</u> \$11.55	<u>\$20.23</u> \$12.05	<u>\$22.25</u> \$12.59	<u>\$24.48</u> \$13.14	<u>\$26.93</u> \$13.72
Multi-family, Apts., Mobile home	<u>\$4.75</u> \$3.72	<u>\$5.23</u> \$3.88	<u>\$5.75</u> \$4.05	<u>\$6.33</u> \$4.23	<u>\$6.96</u> \$4.42
Commercial, Schools, <u>INSTITUTIONAL</u>	<u>\$5.67</u> \$3.95	<u>\$6.24</u> \$4.12	<u>\$6.86</u> \$4.30	<u>\$7.55</u> \$4.49	<u>\$8.31</u> \$4.69
Northern Arizona University	\$3.62	\$3.78	\$3.95	\$4.12	\$4.30
Manufacturing	<u>\$5.33</u> \$3.89	<u>\$5.86</u> \$4.07	<u>\$6.45</u> \$4.24	<u>\$7.10</u> \$4.43	<u>\$7.81</u> \$4.63
Lawn Meters	<u>\$10.05</u> \$3.95	<u>\$11.06</u> \$4.12	<u>\$12.17</u> \$4.30	<u>\$13.39</u> \$4.49	<u>\$14.73</u> \$4.69

<b>Monthly Water Use</b>	<b>Volume Charge</b>				
Hydrant meter	<del>\$7.46</del> <u>\$6.03</u>	<del>\$8.21</del> <u>\$6.30</u>	<del>\$9.03</del> <u>\$6.58</u>	<del>\$9.93</del> <u>\$6.87</u>	<del>\$10.92</del> <u>\$7.17</u>
Standpipe – Water haulers	<del>\$7.41</del> <u>\$6.03</u>	<del>\$8.15</del> <u>\$6.30</u>	<del>\$8.97</del> <u>\$6.58</u>	<del>\$9.87</del> <u>\$6.87</u>	<del>\$10.86</del> <u>\$7.17</u>

Energy Component:

Charge per one thousand (1,000) gallons, applied to all customer classes (refer to subsection (D) of this section)

Energy component cost will be calculated annually based on a one (1) year rolling average of water related energy costs as per subsection (D) of this section.

1. Water Resources and Infrastructure Protection Through Wildland Fire Management Component: In addition to all volume charges, each customer shall pay an additional fee based on water consumption as follows:

Effective 8-1-20	\$0.52 per 1,000 gallons
Effective 7-1-22	\$0.53 per 1,000 gallons

This fee shall be used to protect all Flagstaff water resources and infrastructure from wildland fires including water, wastewater, reclaimed water and stormwater.

### PRIVATE FIRE PROTECTION

<b>Connection Size (Inches)</b>	<b>Monthly Charge</b>				
	<del>1/1/11</del> <u>09/01/2024</u>	<del>1/1/12</del> <u>01/01/2026</u>	<del>1/1/13</del> <u>01/01/2027</u>	<del>1/1/14</del> <u>01/01/2028</u>	<del>1/1/15</del> <u>01/01/2029</u>
4"	<del>\$13.85</del> <u>\$9.41</u>	<del>\$15.24</del> <u>\$10.68</u>	<del>\$16.76</del> <u>\$11.43</u>	<del>\$18.44</del> <u>\$12.23</u>	<del>\$20.28</del> <u>\$12.59</u>
6"	<del>\$40.24</del> <u>\$27.33</u>	<del>\$44.26</del> <u>\$31.02</u>	<del>\$48.69</del> <u>\$33.19</u>	<del>\$53.56</del> <u>\$35.52</u>	<del>\$58.92</del> <u>\$36.58</u>
8"	<del>\$85.76</del> <u>\$58.23</u>	<del>\$94.34</del> <u>\$66.11</u>	<del>\$103.77</del> <u>\$70.74</u>	<del>\$114.15</del> <u>\$75.69</u>	<del>\$125.57</del> <u>\$77.96</u>

Rates for water sold or furnished to customers for use outside the City limits shall be one hundred ten percent (110%) the rates for water sold or furnished for use inside the City.

#### B. Special Rates:

Special rates for customers who are not included in existing customer classifications and have usage characteristics different from other customers may be negotiated between the City and customer, without requiring an amendment to the City Code.

C. Special Rates: If the initial bill of any new consumer or the final bill of any consumer shall show usage of less than one thousand (1,000) gallons for the initial or final billing period, the consumer shall be billed for the initial or final billing period at the prorated amount based on existing rates for each one hundred (100) gallons or fraction thereof.

Because fire hydrants are not designed to sustain continuous use and because such hydrants are part of the emergency fire protection system of the City, regular use of fire hydrants for water supply is discouraged. When an applicant for water to be delivered from a hydrant can show hardship if forced to obtain water from another source, and the request has been approved in writing by the City's ~~Utilities~~ **WATER SERVICES** Director, the Division may install a meter on a fire hydrant for the use of such applicant, following payment of the required fee for such installation and use. The applicant shall be and remain responsible for payment to the City for all water used through such hydrant meter, and for the purpose of protecting **THEM** himself may place a lock upon said meter.

The fee for installation and use of such hydrant meter shall be ~~\$356.00~~ 440.00. The rate of water delivered through a hydrant meter shall be at existing standpipe rate. In addition, a ~~seven hundred dollar (\$700.00) deposit will~~ **MAY** be required to assure repair work on the meters and **ASSOCIATED PARTS** hydrants if needed. **THE DEPOSIT FOR A THREE QUARTER (3/4) INCH METER IS TWELVE HUNDRED AND FORTY-FIVE DOLLARS (\$1245.00) AND THE DEPOSIT FOR A THREE (3) INCH METER IS THREE THOUSAND SEVEN HUNDRED AND EIGHTY DOLLARS (\$3780.00). EXCEPTIONS TO THE DEPOSIT WILL BE DETERMINED BY THE CUSTOMER SERVICE DIRECTOR.** ~~An additional three hundred dollar (\$300.00) will be required when a backflow prevention device is necessary.~~ The deposits will be refunded if there is no damage sustained when the meter and/or backflow device is returned to the City.

D. Automatic Rate Adjustments. The City agrees to adopt a rate schedule which provides for automatic adjustments to pass along increases in energy related operating costs for delivering water service based on the current electrical and gas tariff rates on file with the Arizona Corporation Commission. Automatic adjustments to the energy surcharge shall be calculated on an annual basis using the past **TWELVE (12)** months rolling average of water related energy charges.

1. Energy Cost Adjustment. City reserves the right to automatically pass along future increases in electrical and natural gas energy related charges imposed on City by another agency. These automatic adjustments may be made whenever the other agency: (1) increases the standard cost of energy beyond the current energy cost assumed by City in the proposed rate structure described in this section.
2. Adjustments shall begin on January 1 of each calendar year and continue through the end of year.

### **7-03-001-0011 WATER MAIN CAPACITY CHARGES**

The water main capacity charges for all new service connections to be charged by the Finance **CUSTOMER SERVICE** Section is presented in the following schedule:

- A. A capacity charge, as prescribed below, shall be assessed upon:
  1. Initial connection to the municipal water system; or

2. Any increase in meter size.

B. The capacity charges for the various types of users are as follows:

**SCHEDULE FOR CAPACITY CHARGES**

Meter Size	Capacity Charge		<u>MAXIMUM FLOW RATE (GPM)</u>
	<u>Effective 7/1/16</u> <u>09/01/2024</u>		
5/8" x 3/4"	<u>\$8,146</u>	<del>\$5,728</del>	<u>30</u>
1"	<u>\$13,604</u>	<del>\$9,566</del>	<u>50</u>
1-1/2"	<u>\$27,126</u>	<del>\$19,074</del>	<u>100</u>
2"	<u>\$43,418</u>	<del>\$30,530</del>	<u>160</u>
3"	<u>\$81,456</u>	<del>\$57,279</del>	<u>350</u>
4"	<u>\$84,459</u>	<del>\$95,484</del>	<u>500</u>
6"	<u>\$271,500</u>	<del>\$190,910</del>	<u>1,000</u>
8"	<u>\$434,417</u>	<del>\$305,468</del>	<u>1,600</u>
10"	<u>\$624,541</u>	<del>\$439,157</del>	<u>4,200</u>

Meters will be sized using the American Water Works Association Manual, AWWA No. M22. Sizing will be submitted to the City WATER SERVICES DIVISION Utilities Department by the developer or owner for City review.

WHEN THE FEE SCHEDULE REFERENCES "CALL", All capacity charges ARE BASED ON for connections larger than four inches (4") shall be based on a proration of midrange MAXIMUM flow gallons per minute (gpm) of a 5/8 x 3/4 inch meter divided into the midrange MAXIMUM flow of the meter to be evaluated. The resulting number shall be used as a multiplier times the capacity fee for a 5/8 x 3/4 inch meter to determine the large meter capacity fee. Meters will be sized using American Water Works Association Manual, AWWA No. M22. Sizing will be submitted to the City by the developer or owner for City review.

Where the capacity charge is based on volume, said charge will initially be calculated based on an estimate of flowage agreed upon by the City and the customer and will be adjusted based upon the volume of the highest consecutive twelve (12) month period for the thirty-six (36)

~~months immediately following commencement of service or assessment of an additional capacity charge.~~

When the capacity charge results from an increase in meter size the charge shall be adjusted to the difference between the charge for the new size meter and the ~~charge for the previous size meter~~ BASED ON THE CURRENT CAPACITY FEES. NO REFUND SHALL BE MADE IN THE CASE OF REDUCED VOLUME OF DISCHARGE FROM A CHANGE OF USE.

~~C. The Division shall review all customer accounts with meters larger than four inches (4") on an annual basis and assess an additional capacity charge when the annual average demand increases by twenty percent (20%) or more. The additional capacity charge will be calculated using the recommended meter size by AWWA Manual No. M22 or equating to equivalent 5/8 x 3/4 inch meters but substituting for demand the difference between actual current demand, as determined by the previous twelve (12) month average, and the demand used to calculate the previous capacity charge assessed upon the customer.~~

C. CAPACITY FEE INSTALLMENT PAYMENTS. CAPACITY FEES MAY BE PAID FOR BY INSTALLMENT PAYMENTS IN ACCORDANCE WITH THE FOLLOWING CONDITIONS:

1. A CAPACITY FEE THAT TOTALS AN AMOUNT GREATER THAN ONE HUNDRED THOUSAND DOLLARS (\$100,000) MAY BE PAID AS FOLLOWS:

A. NO LESS THAN ONE-THIRD (1/3) OF THE TOTAL CAPACITY FEE DUE IS TO BE PAID UPON RECEIPT OF THE APPLICATION FOR CONNECTION TO THE WATER SYSTEM.

B. THE BALANCE DUE OF THE CAPACITY FEE IS TO BE PAID IN EQUAL MONTHLY INSTALLMENTS OVER NO MORE THAN THIRTY-SIX (36) MONTHS TO INCLUDE AN INTEREST RATE CALCULATED TO BE THE PRIME RATE + 1/2% AT THE TIME OF THE APPLICATION.

C. THE CUSTOMER MAY BE REQUIRED TO SECURE THE BALANCE DUE TO THE CITY BY A LETTER OF CREDIT DRAWN IN FAVOR OF THE CITY, OR IN ANY OTHER FORM OF SECURITY SATISFACTORY TO THE CITY MANAGER, CITY ATTORNEY AND MANAGEMENT SERVICES DIRECTOR.

**7-03-001-0012 WATER REVENUE FUND**

There is hereby created a fund to be known and kept as the "water fund". Said fund shall be applied exclusively to the payment of the expense of operating, maintaining and keeping in repair the said water system, the payment of interest of any bonds issued for the purpose of construction of waterworks, and the establishment and continuance of a sinking fund.

**7-03-001-0013 CITY WATER MAIN EXTENSION POLICY**

A. Definitions: For the purpose of this Section, the following words and phrases shall have the meanings respectively ascribed to them herein, unless the text clearly indicates otherwise.

DEVELOPER AND OWNER: Any person or persons engaged in the requesting and financing of a water main extension beyond the present City water mains to one or more parcels of land.

The term includes subdividers, industrial developers, private property owners and companies, who improve platted or unplatted property.

CITY: The word "City" shall mean the City of Flagstaff in the County of Coconino, State of Arizona, except as otherwise indicated.

MAIN: Any water line which constitutes or will constitute part of the City water system.

B. Size of Water Main Extensions: No water main will be installed with less than the minimum pipe size dictated by good engineering practice, and adopted standards set forth in the Uniform Building Code (current adopted edition), Uniform Fire Code (current adopted edition), General Construction Standards and Specifications of the City, current subdivision regulations, or the general land use plan currently adopted.<sup>1</sup> In no case shall any water main be of a size less than six inches (6") for residential areas and eight inches (8") for commercial and industrial areas.

1. Section 8-10-001-0001; Title 8 of the City Code, respectively

C. Replacement or Repair: All persons or other entities who create, cause to be built or build any such extensions of any services as contemplated herein, shall also pay for any and all such replacements as becomes necessary as a direct or indirect result of the creation, building or construction of such extensions. For example, repairs or replacement of sidewalks, paving or other utilities damaged or disturbed during the building of water line extensions.

D. Agreement Between City and Developer-Owner: Before the extension of any water main shall be made to serve a subdivision, platted or unplatted property, or any existing main tapped to provide service for any individual or unplatted property, the developer-owner desiring such service shall execute an agreement with the City which shall include in the following:

1. A warrant of workmanship QUALITY and material for mains and facilities installed which shall run to the benefit of the City for a period of at least one year, from the date of acceptance by the City.
2. A diagram of all property which may be served by any main and appurtenances upon completion and acceptance of the work by the City.
3. A statement that the City acquires ownership of any main and appurtenances upon completion and acceptance of the work by the City.
4. A statement of the developer-owner's proportionate share of the cost for previously installed mains, if any reimbursement agreements are in existence concerning the line.

E. Costs of Extension: The developer causing an extension of water mains shall pay in full for the rights of way and easements, the purchase, construction and installation of the lines, pipes, mains, fire hydrants and all other extension costs. However, the City reserves the right to increase the diameter of the main extension if it is deemed advisable, but under the condition that the laid cost of the main extension of the larger diameter pipe to the developer will not exceed the laid cost of the same extension of a size necessary to serve solely the proposed development.

F. Penalty: Any person who excavates or causes an excavation to be made for the purpose of laying any water lines or pipes in the public streets, alleyways or other property of the City

without first complying with the provisions hereof, shall be subject to a fine of not less than two hundred dollars (\$200.00) nor more than three hundred dollars (\$300.00). A separate offense shall be deemed committed upon each day during or on which a violation occurs or continues.

## **7-03-001-0014 WATER CONSERVATION**

### **A. Definitions:**

1. **Commercial Provision:** An agreement between the WATER SERVICES Utilities Division and a commercial customer where compliance with the Strategy Level may cause unreasonable economic hardship. A Commercial Provision may be applied for by a business that requires a water use for its day-to-day business operation to succeed. There is no fee associated with obtaining a Commercial Provision. Commercial Provisions shall not be considered for aesthetic landscaping purposes. Examples of businesses that may request a Commercial Provision include, but are not limited to, landscapers and nurseries. A request for a Commercial Provision shall be made in writing to the WATER SERVICES Utilities-Director and shall include the nature of the business, the anticipated water usage per day, and what steps are being taken to conserve water at the business location. Approval and denial commercial provision letters shall be copied to the City Manager and City Council for informational purposes.
2. **Emergency Authority:** Authority to make operational adjustments and/or changes to the potable water and reclaimed water system for the purpose of protecting the system from damage, maintaining water supply, or restoring the system to operation after a system failure. This includes authority to mix potable water with reclaimed water for the purpose of protecting the system from imminent system damage.
3. **Even-numbered address:** Any street address ending in; zero (0), two (2), four (4), six (6), or eight (8).
4. **Irrigate:** To supply land or crops with water by means of pipes or hoses.
5. **Odd-numbered address:** Any street address ending in; one (1), three (3), five (5), seven (7), or nine (9).
6. **Potable Water:** Water that is safe and satisfactory for drinking and cooking.<sup>1</sup>
7. **Reclaimed Water:** Water that has been treated or processed by a wastewater treatment plant or an on-site treatment facility. (ARS 49-201.31)
8. **Resource Status I:** When water demand is equal to or less than safe production capability.
9. **Resource Status II:** When water demand exceeds safe production capability for five (5) consecutive days.
10. **Resource Status III:** When water demand exceeds total production capability and the amount of water in storage may impair fire protection for the City.
11. **Safe Production Capability:** 90% of total water resources available measured in million gallons per day (MGD), based on potable water production and distribution components.

12. Special Provision: An agreement between the WATER SERVICES Utilities-Division and a large-volume irrigator allowing special hours of irrigation due to public access concerns or hydraulic constraints.
13. Surcharge: To charge an additional fee, cost, or levy.
14. Total Production Capability: The total water resources available measured in million gallons per day (MGD), based on potable water production and distribution components.
15. Unreasonable Economic Hardship: A hardship where a business' ability to operate using normally accepted practices is adversely affected by the water restriction.
16. Water Availability Strategy: An effort initiated to ensure the availability of adequate water resources for the future, and in times of emergency.
17. Wasting Water: To use or expend water thoughtlessly or carelessly. Examples include, but are not limited to, allowing water to run into the street/gutter, allowing water to pool, irrigating during precipitation events, and failing to repair water leaks. The determination of Wasting Water shall be made by a representative of the City of Flagstaff.

<sup>1</sup> Symons, James M. et al., The Drinking Water Dictionary (American Water Works Association, 2001), P. 333.

B. The City Manager, upon the recommendation of the WATER SERVICES Utilities-Director, after notification to the City Council is hereby authorized to declare and suspend Water Availability Strategies and elements of Strategies. The Strategies may be initiated and suspended based upon Resource Status Levels, or other pertinent information, which evaluate the relationship between water demand and municipal safe production capability.

C. The WATER SERVICES Utilities-Division has emergency authority to take operational measures deemed necessary to protect the potable and reclaimed water systems.

D. Augmentation of the reclaimed water system with potable water except as referenced in Paragraph C shall require prior approval of the City Manager, upon the recommendation of the WATER SERVICES Utilities-Director and after notification to the City Council.

E. The following Water Availability Strategies shall govern the use of City water by any user of the City potable water system, as prescribed below:

1. Strategy I: Water Awareness (may implement with Resource Status I). Conserve water, in and outside of the home, using the best practices available to minimize waste. Water users are specifically encouraged to landscape with plant materials requiring little or no supplemental irrigation water. The following uses are restricted or prohibited.

No person shall:

- a. Irrigate between the hours of 9 AM and 5 PM. Even-numbered street addresses shall irrigate Wednesday, Friday, and Sunday. Odd-numbered street addresses shall irrigate Tuesday, Thursday, and Saturday. No irrigation shall be allowed on Monday. Daily hand watering with a hose or watering can is allowed. Strategy I irrigation hours

shall apply to hand watering. Water use for maintenance of irrigation systems is permitted during all times of the day.

- b. Use water from a fire hydrant unless for public health or safety, or with the authorization of the WATER SERVICES ~~Utilities~~-Division.
- c. Waste water, as defined in section A.
- d. Irrigate golf courses with potable water.

New landscape permits. Daily irrigation of new landscape may be allowed for elective landscaping and will be allowed for required landscaping by obtaining a permit from the Water Conservation Office. The permit shall be good for a maximum of thirty (30) days. The fee for the permit shall be ten dollars (\$10) to cover administration and printing, and shall be adjusted to cover changing costs. The permit shall be obtained prior to landscape installation and prominently posted at the irrigation site. The determination of provision of an elective landscaping permit shall be made by a representative of the WATER SERVICES ~~Utilities~~-Division and may be appealed by the applicant to the Flagstaff Water Commission if thought to be unreasonably denied. The decision of the Water Commission shall be final. Strategy I irrigation hours shall apply to irrigation permits.

2. Strategy II: Water Emergency (may implement with Resource Status II). In addition to the requirements of Strategy I, the following uses are restricted or prohibited.

No person shall:

- a. Irrigate or wash vehicles, except as provided. Even-numbered street addresses are restricted to said uses on Wednesday, Friday, and Sunday. Odd-numbered street addresses are restricted to said uses on Tuesday, Thursday, and Saturday. No outdoor watering activity shall be allowed between the hours of 9 AM and 5 PM. Vehicle washing for public health and safety shall be exempt. This restriction shall not apply to commercial car washes.
- b. Wash paved areas such as drives, sidewalks and tennis courts, or buildings, except for health or safety. Restriction shall not apply to commercial high pressure water blasting for maintenance or construction purposes during strategy II. The use of Reclaimed Water for said uses shall not be restricted.
- c. Use potable water for filling ornamental fountains, artificial ponds or streams.
- d. Fill recreational swimming pools, spas, or wading pools holding more than one hundred (100) gallons.
- e. Use potable water for major construction activity, such as dust control, soil compaction, or street cleaning. Major construction activity shall be considered that activity requiring the use of a hydrant meter for the dispensing of potable water or obtaining the water from City of Flagstaff standpipes.

Single-Family Residential, and all lawn meter rates shall increase to one hundred fifty percent (150%) of the established rate for any water consumption between six thousand two hundred one (6,201) and eleven thousand five hundred (11,500) gallons. Rates shall increase to two

hundred percent (200%) of the established rate for any water consumption greater than eleven thousand five hundred one (11,501) gallons per billing cycle. Rate increases shall take effect with the billing cycle(s) following the implementation of Strategy II.

Multi-family, Commercial, Industrial, and Institutional water rates shall increase to 120% of the established rate. The rate increase shall take effect with the billing cycle(s) following the implementation of Strategy II.

Potable water standpipe rates shall increase to one hundred thirty percent (130%) of the established rate. The rate increase shall take effect upon implementation of Strategy II. Standpipe water shall be limited to uses within a twenty-five (25) mile radius of City Hall. Standpipe water shall not be used for major construction activity, dust control, irrigation of decorative landscaping and/or turf.

No new elective or required landscaping permits shall be issued. Landscaping not installed and required by the City of Flagstaff to meet the Land Development Code will not delay a Certificate of Occupancy to be issued providing its installation is delayed as a result of a suspension of new landscaping permits and a surety is provided acceptable to the Community Development Division.

Upon suspension of Strategy II, rates shall return to their respective level with the billing cycle(s) following the date of the suspension, or in the case of standpipe rates, upon suspension.

3. Strategy III. Water Crises (may implement with Resource Status III). In addition to the requirements of Strategy I and Strategy II, the following uses are restricted or prohibited.

No person shall:

- a. Use any potable water for outside use.
- b. Use fire hydrants, unless for public health, safety, and welfare by authorized government agencies only.
- c. Waste water intentionally or unintentionally. Specifically applies to all residential, commercial, industrial, and institutional use.
- d. Use potable water in violation of any other restriction deemed necessary by the City Council for the purpose of protecting the welfare of the citizens of Flagstaff.

No new Special or Commercial provisions shall be allowed unless approved by the Flagstaff City Council or the Water Commission.

D. Surcharges/Appeals:

1. A Surcharge of \$25.00 shall be assessed to the account of record for a violation of Strategy I.
2. A Surcharge of \$50.00 shall be assessed to the account of record for a violation of Strategy II.

3. A Surcharge of \$100.00 shall be assessed to the account of record for a violation of Strategy III.
4. Surcharges shall double for every repeat violation. Each succeeding Surcharge under the prevailing strategy level may be twice the previous Surcharge assessed for the previous violation.
5. A commercial water hauler determined to be violating the standpipe restrictions shall pay a surcharge equal to that for the appropriate Strategy Level prior to the receipt of additional water.
6. The assessment of the Surcharge may be informally appealed, in writing, within fourteen (14) calendar days of the notice of the Surcharge assessment. The written appeal shall be received by the City of Flagstaff WATER SERVICES ~~Utilities~~-Division within said fourteen (14) day time limit or the right to such appeal shall be permanently waived. Address all Surcharge-related correspondence to:

City of Flagstaff WATER SERVICES ~~Utilities~~-Division  
Water Conservation Program Manager

2323 N WALGREENS ST, SUITE 1 ~~211 West Aspen Avenue~~  
Flagstaff, AZ 86004 ~~86001~~

### **7-03-001-0015 CROSS CONNECTION CONTROL**

#### **A. Definitions.**

**Approved:** The term "approved" as herein used in reference to a water supply shall mean a water supply that has been approved by the Arizona Department of Environmental Quality (ADEQ) and the City of Flagstaff.

The term "approved" as herein used in reference to backflow prevention assemblies or methods shall mean an approval by the City of Flagstaff, WATER SERVICES ~~Utilities~~-Division based on a favorable laboratory and field evaluation report by a testing laboratory recognized by the Division.

**Assembly:** Any system for backflow protection consisting of more than one component and having been tested as one unit, and approved as one unit by the Division.

**AWWA:** American Water Works Association.

**Backflow:** The undesirable reversal of flow of water or mixtures of water and other liquids, gases, or other substances into the distribution pipes of the potable water supply from any source or sources. Backflow is caused by either backpressure or backsiphonage.

**Backflow prevention assembly approval:** Any backflow prevention assembly equipped with test cocks shall have been issued a certificate of approval by the USC Foundation for Cross-Connection Control and Hydraulic Research. Any backflow prevention assembly not equipped with test cocks shall be certified by a third-party entity unrelated to the product's manufacturer or vendor and approved by the Arizona Department Of Environmental Quality (ADEQ). A backflow

prevention assembly not listed by USC-FCCCHR cannot be used for containment, fire line or landscape protection.

**Backflow prevention method:** A backflow prevention method may be approved by the City of Flagstaff if it is contained in the most current edition of the USC-FCCCHR Manual of Cross-Connection Control.

**Backflow Prevention Assembly Tester (registered):** A person who is currently certified by an authority recognized in the Arizona Department of Environmental Quality regulations and is approved and registered with the City of Flagstaff to test, repair, and maintain backflow prevention assemblies.

**Backpressure:** Any Elevation of pressure in the customer's water distribution system (by pump, elevation of piping, or steam and/or air pressure) above the public potable water supply pressure which could cause a reversal of the normal direction of water flow from the consumer's water supply system into the public potable water supply system.

**Backsiphonage:** A form of backflow due to a reduction in the public water supply system pressure which causes a negative or sub-atmospheric pressure to exist at a site in the water system. A reversal in the normal flow of water results.

**Check Valve –** A valve that allows free flow in one direction and stops flow in the other direction.

**Close as practicable:** Is the point nearest the service connection where the assembly can be installed. Where the assembly installation location may interfere with obstacles such as driveways and sidewalks, then close as practicable is the nearest point after the obstacle, but in no event beyond the first tap.

**Compliance date:** The annual date by which the annual backflow prevention assembly compliance test report must be received by the City of Flagstaff Cross Connection Control office.

**Consumer or Customer:** The owner, official custodian or person in control of any premises or any property supplied by or in any manner connected to the City of Flagstaff public water supply system.

**Contamination:** An impairment of the quality of the water which creates an actual hazard to the public health through poisoning or through the spread of disease by sewage, industrial fluids, waste, etc.

**Cross-Connection:** Any unprotected actual or potential connection or structural arrangement between a public or a consumer's potable water system and any other source or system through which it is possible to introduce into any part of the potable system any used water, industrial fluid, gas, or substance other than the intended potable water with which the system is supplied. By-pass arrangements, jumper connections, removable sections, swivel or change-over devices and other temporary or permanent devices through which or because of which "backflow" can or may occur are considered to be cross-connections.

**Division:** The City of Flagstaff, Water Services Division.

Hazard: A cross connection or potential cross connection between the public water supply and a private plumbing system involving any substance that could, if introduced into the public water supplies, be aesthetically objectionable or a nuisance (pollution), cause severe damage to the physical facilities of the public water supply systems, cause death, illness, or spread disease (contamination), or have a high probability of causing such effects.

Hazard, Degree of: Evaluation of the potential risk to the public health and/or adverse effects upon the potable water supply system. Health hazards shall be classified as contamination while non-health hazards shall be classified as pollution.

Health Hazard: Any condition, device or practice in a water system or its operation resulting from a real or potential danger to the health and well-being of consumers. The word "severe" as used to qualify "health hazard" means a hazard to the health of the user that could be expected to result in death or significant reduction in the quality of life.

Improper: Not functioning within the manufacturer's or City of Flagstaff's specifications or the requirements of this section.

Inspection: A visual examination of a premise or any backflow protection equipment, materials, workmanship QUALITY OF WORK and operational performance.

Maintenance: Work performed or repairs made to keep backflow prevention assemblies operable and in compliance.

O.S. & Y. Valve: Outside screw and yoke control valve for fire sprinkler systems.

Pollution: An impairment of the quality of the water to a degree which does not create a hazard to the public health but which does adversely and unreasonably affect the aesthetic qualities of such waters for domestic use.

Proper: Functioning within the parameters of the manufacturer's and City of Flagstaff's specifications and the requirements of this article.

Public water supply system: All mains, pipes and structures owned and/or maintained by the City of Flagstaff, through which water is obtained and distributed to the public, including wells and well structures, intakes and cribs, pumping stations, treatment plant reservoirs, storage tanks and appurtenances, collectively or separate, actually used or intended for use for the purpose of furnishing potable water.

Reclaimed water: Wastewater that has been sufficiently treated by the City of Flagstaff's water reclamation plants for approved use, and is provided through the City of Flagstaff's reclaimed water system.

Retrofit: Furnish new parts, equipment, or method of installation, any existing assembly that does not meet the requirements of this ordinance in such a way that will bring the assembly into compliance with this Ordinance.

Service Connection: The terminal end of a water tap from the public potable water system, (i.e. where the water purveyor may lose jurisdiction and sanitary control over the water at its point of delivery to the consumer's water system). If a city-owned meter is installed at the end of the service connection, then the service connection shall mean the discharge end of the meter.

Service Protection: The acceptable backflow prevention method installed between a City of Flagstaff's water meter and a customer's private plumbing system.

Testing: An authorized procedure to determine the operational and functional status of a backflow prevention assembly.

B. Purpose and Application.

1. To protect the public water supplies of the City of Flagstaff from the possibility of contamination or pollution by preventing the backflow of contaminants and pollutants into the public water supply systems.
2. To promote the elimination or control of cross-connections, actual or potential, between a customer's internal water systems, plumbing fixtures, industrial piping systems, and the public water supply.
3. To provide for a continuing program of cross-connection control which will prevent the contamination or pollution of the public water supply systems.
4. To implement the requirements of the most current AAC pertaining to the cross-connection control program requiring public water systems to protect against backflow, and to this end, this chapter shall be construed and applied consistently with the requirements of the most current AAC.

C. General Requirements.

1. Cross-connections prohibited. Connections between the public water supply system and other systems or equipment containing water or other substances of unknown or questionable quality are prohibited except when and where approved backflow prevention assemblies or methods are installed or implemented, tested and maintained to Division specifications to insure proper operation on a continuing basis.
2. Rights and Responsibilities of the Division. It shall be the right and responsibility of the Division to evaluate and investigate as deemed necessary, industrial and commercial properties served by the public water supply to determine whether actual or potential hazards to the public water supply exist. Such evaluations and investigations shall be repeated as often as the Division deems necessary.

It shall also be the right and responsibility of the Division to require the installation and annual testing of backflow prevention assemblies at any premises or property where such potential or actual hazards are found to exist.

3. Responsibility of the Consumer. The consumer, as defined by Section 7-03-001-0015(A), shall be responsible and financially obligated for the protection of the public water supply system from the possibility of contamination or pollution due to backflow or backsiphonage of contaminants through the customer's water service connection into the public potable water system.
4. Existing Facilities.

a. All presently installed backflow prevention assemblies, devices, or methods which do not meet the requirements of the Division and/or applicable state or federal regulations but were approved for the purposes described herein at the time of installation shall be evaluated for their ability to efficiently and satisfactorily protect the public water system from potential or existing cross connections with the private water supply. If, upon such evaluation, the Division determines that an existing device, method or assembly does not meet existing requirements, the customer shall at their own expense, upon due written notice and within the prescribed time indicated on the notice; retrofit, replace or modify the installation of such to meet current standards or show just cause for noncompliance.

b. Whenever an existing device, method or assembly is removed or moved from the present location, requires more than minimum maintenance, or when the Division finds that the maintenance constitutes a hazard to health, the unit shall be replaced by an approved backflow prevention assembly meeting the requirements of these regulations.

c. If an existing facility undergoes construction for improvements or change of use, the installed backflow assemblies will be evaluated for hazard. If it is found the current backflow assembly(ies) is inadequate protection, the customer will be required to replace with a device suited for the hazard.

5. New Facilities.

a. New facilities shall present their plans for review by an authorized representative of the Division for determination of cross-connection hazards.

b. All backflow prevention assemblies to be installed shall be shown on all required building and engineering plans. No installation of assemblies shall be made unless these plans are reviewed and approved by an authorized representative of the Division.

c. During construction of new facilities, water shall not be used for construction purposes until the containment backflow assembly has been tested.

d. All assemblies shall be inspected by an authorized representative of the Division upon installation and the consumer shall provide written verification that the assembly has been successfully tested as described in subsection (K) of this section, prior to issuance of certification of occupancy. Water service may be withheld if the assembly is not installed and tested in accordance with this chapter and Division requirements.

6. Adoption of Public Record. The most current edition of the USC-FCCCHR Manual of Cross-Connection Control.

D. List of Backflow Prevention Methods. A backflow prevention method shall be any assembly or other means designed to prevent backflow. The following are the recognized backflow prevention methods which the City of Flagstaff may require (in order of degree of protection):

1. Air Gap (AG): The unobstructed vertical distance through the free atmosphere between the opening of the pipe or faucet supplying potable water to a tank, plumbing fixture or other device. An approved air gap shall be at least double the effective opening of the supply pipe or faucet and in no case less than one (1) inch above the flood rim.

2. Reduced Pressure Principle Assembly (RPA or RP): An assembly containing two (2) independently acting approved check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves, and at the same time, below the first check valve. The assembly shall include properly located test cocks and tightly closing shutoff valves located at each end of the assembly.
3. Reduced Pressure Principle Detector Assembly (RPDA): An assembly composed of a line sized approved reduced pressure principle assembly with a bypass containing a specific water meter and an approved reduced pressure principle assembly.
4. Double Check Valve Assembly (DCVA or DC): An assembly composed of two (2) independently acting, approved check valves, including tightly closing shutoff valves located at each end of the assembly and fitted with properly located test cocks.
5. Double Check Detector Assembly (DCDA OR DDCVA): An assembly composed of a line size approved double check valve assembly with a bypass containing a specific water meter and an approved double check valve assembly.
6. Pressure Vacuum Breaker Assembly (PVB): An assembly containing an independently operating, loaded check valve and an independently operating, loaded air inlet valve located on the discharge side of the check valve. The assembly shall be equipped with properly located test cocks and tightly closing shutoff valves located at each end of the assembly.
7. Spill-Resistant Pressure Vacuum Breaker (SVB): An assembly containing an independently operating internally loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve. The assembly shall be equipped with a properly located resilient seated test cock, properly located bleed/vent valve and tightly closing resilient seated shutoff valves located at each end of the assembly.
8. Repealed by Ord. 2021-09.
9. Repealed by Ord. 2021-09.

E. Backflow Prevention Methods Required.

1. The following conditions shall warrant the installation of an approved backflow prevention assembly:
  - a. When the City of Flagstaff determines that the water supplied by the public water systems may be subject to contamination or pollution, an approved backflow prevention method shall be required at every service connection to a customer's water system. The customer shall install the required backflow protection within the time specified by the City of Flagstaff. In determining the time in which backflow protection shall be installed, the City of Flagstaff shall consider the degree of hazard potential to the public water supplies.
  - b. The backflow prevention method required shall be determined by the City of Flagstaff. The method required by the City of Flagstaff shall be sufficient to protect against the hazard potential as stated in the most current edition of the University of

Southern California Foundation for Cross-Connection Control and Hydraulic Research (USC-FCCCHR) Manual of Cross-Connection Control.

- c. Premises with internal cross-connections which the division determines to be noncorrectable, or premises with plumbing systems so intricate that a cross-connection inspection is impossible or impractical.
- d. Premises with security restrictions or other access prohibitions which make cross-connection inspections impossible or impractical.
- e. Premises with an existing unprotected cross-connection or with a history of cross-connection violations.

2. Whenever the following items exist or activities are conducted on premises served by the public water systems, a potential hazard to the public water supplies shall be presumed, and a backflow prevention method of the type specified herein for that item or activity must be utilized or installed at each service connection for that premises. If an activity or item is not on the following list, it shall be evaluated by the City of Flagstaff and a method of backflow prevention will be determined.

- a. Cooling tower, boiler, condenser, chiller, and other cooling systems: RP.
- b. Tank, vessel, receptacle, and all other water connections, including mobile units, except emergency vehicles and private swimming pools: RP.
- c. Ice maker (other than a residential service): RP.
- d. Water-cooled equipment, boosters, pumps or autoclaves: RP.
- e. Water treatment facilities and all water processing equipment (other than residential water softeners): RP.
- f. Bottle washer, bedpan washer, garbage can washer: RP.
- g. Pesticide, herbicide, fertilizer, and chemical applicators (other than typical in-home use): RP.
- h. Aspirator: RP.
- i. Commercial dishwashers, food processing and/or preparation equipment, carbonation equipment or other food service processes: RP.
- j. Decorative fountain, baptismal, nonresidential swimming pool or spa, or any location water is exposed to atmosphere: RP.
- k. X-ray equipment, plating equipment, or any other photographic processing equipment: RP.
- l. Auxiliary water supply and/or connections to unapproved water supply systems: RP.

- m. Reclaimed water sites with potable water connections: RP on the potable meter, AG between feed line from supplemental domestic water supply to a holding tank to reclaim water lines.
- n. Recreational vehicle dump stations (sewer), or any other location where water may be exposed to bacteria, virus or gas: RP.
- o. Any premises on which chemicals, oils, solvents, pesticides, disinfectants, cleaning agents, acids or other pollutants and/or contaminants are handled in a manner by which they may come in direct contact with water, or there is evidence of the potential to contact water: RP.
- p. Materials and piping systems unapproved by the currently adopted City of Flagstaff Plumbing Code or Environmental Protection Agency (EPA) for potable water usage: RP.
- q. Separately metered or unprotected irrigation systems, and construction water services: RP or PVB/SVB as allowed.
- r. Any premises where a cross-connection is maintained or where internal backflow protection is required pursuant to the City of Flagstaff adopted plumbing code: RP.
- s. Multimetered properties with more than one (1) meter connected to another or any building three (3) stories or greater than thirty-four (34) feet in height from service level: RP.
- t. Fire systems – AWWA Classes 1 and 2 and all systems constructed of a piping material not approved for potable water pursuant to the City of Flagstaff Plumbing Code: DCVA (DC) or Double Detector CVA (DCDVA): DC residential fire sprinklers shall be exempt from this requirement.
- u. Fire systems – AWWA Class 3, 4, 5, 6: RP or RP with detector.
- v. Fire systems which require backflow protection and where backflow protection is required on the industrial/domestic service connection that is located on the same premises, both service connections will have adequate backflow protection for the highest degree of hazard affecting either system: RP.
- w. Any premises which has a source of water supply that is not accepted by the public water system or not approved by the Arizona Department of Environmental Quality: RP or AG as determined by the City of Flagstaff.
- x. Any premises where an unprotected cross-connection exists or where there has previously occurred a cross-connection problem within the premises: AG or RP as determined by the City of Flagstaff.
- y. Any premises where there is a significant possibility that a cross-connection problem will occur and entry onto the premises is restricted to the extent that cross-connection inspections cannot be made with sufficient frequency or on sufficiently short notice to assure that unprotected cross-connections do not exist: RP or AG as determined by the City of Flagstaff.

- z. Multi-use commercial property: RP.
- aa. Properties with active private wells: RP.
- bb. Consecutive systems, when required by the City of Flagstaff: RP.
- cc. Fire hydrant/construction water: RP.
- dd. Jumper connection to new water mains: RP.
- ee. Post mix soda machine with a carbonator: ASSE 1022.
- ff. Shampoo sink: RP.
- gg. Brewery, distillery, meadery, or alcohol making process: RP OR AG.
- hh. Hospitals and medical offices: RP.

F. Installation Requirements.

1. The Division shall use the most current edition of the USC-FCCCHR Manual of Cross-Connection Control for list of approved assemblies.
2. Backflow prevention assemblies shall have a diameter at least equal to the diameter of the service connection.
3. Backflow prevention assemblies shall be installed and maintained by the customer, at the customer's expense and in compliance with the standards and specifications adopted by the City of Flagstaff at each service connection. The customer is responsible for notifying the City of Flagstaff Industrial Pretreatment Section of any installation, repair, relocation, removal, or replacement.
4. The approved assembly shall be installed above ground, as close as practicable, to the service connection before the first branch line leading off the service line, and in a hot box with electricity for heat. The heated enclosure must be ASSE 1060 certified or similar. The electrical for the heat must be installed in accordance with City-approved building code and City Engineer standard drawing 19-02-025. Assemblies shall be installed per manufacturer's specifications with adequate clearances for testing and maintenance, and not installed in a meter box, pit or vault.
  - a. Where containment at the property line cannot be achieved or is waived based on extenuating circumstances, installation within a building can be completed, provided a City of Flagstaff Attorney-approved "Backflow Prevention Assembly Hold Harmless Agreement" is signed by the property owner and notarized. This document must be received and approved by the City of Flagstaff Industrial Pretreatment Supervisor prior to the installation of the backflow prevention assembly. The interior installation of a backflow assembly must be done as close as practicable to the incoming water line.

- b. Internal installations shall have clearance on all sides and ends for testing and maintenance. RP and DC assemblies must have twelve (12) inch bottom clearance from lowest point on the assembly (i.e., relief valve on RP style).
5. When a customer requires a continuous water supply, two (2) backflow prevention assemblies shall be installed parallel to one another at the service connection to allow a continuous water supply during testing, repair and/or maintenance of the backflow prevention assemblies. When backflow prevention assemblies are installed parallel to one another, the sum of the cross-sectional diameters of the assemblies shall be at least equal to the cross-sectional diameter of the service connection or service line piping at the point of installation and the assemblies shall be of the same type.
6. For an AG installation all piping installed between the user's connection and the receiving tank shall be entirely visible unless otherwise approved in writing by the City of Flagstaff Industrial Pretreatment Section.
7. Any property with more than one (1) water service connection shall install backflow prevention assemblies on each service connection to the property, unless otherwise designated by the Division.
8. Fiberglass insulation cannot be wrapped or otherwise placed around a backflow prevention assembly as a form of freeze protection as it allows condensation to occur and subsequent degradation of the backflow prevention assembly. There must be adequate air flow around the backflow prevention assembly to prevent the formation of condensation on the assembly or for a purge event by a RP relief valve.
9. All test cocks and relief ports on a backflow prevention assembly must be accessible for testing and for release of water from the relief port during a discharge event.
10. PVB, AVB, or RP backflow assemblies are approved for irrigation systems. Valves shall not be installed downstream from an AVB. If chemicals will be used, a RP assembly is required.
11. If a customer fails to install a backflow prevention assembly pursuant to this chapter, the City of Flagstaff shall discontinue water service and assess a compliance fee pursuant to this chapter.
12. If, in the judgment of the Division, an approved backflow prevention assembly is necessary for the protection of the public water system, the Division shall give notice to the consumer to install such. The consumer, after due written notice and within the prescribed time indicated on the notice, shall install such approved assembly(ies) at their own expense. Installation of such assembly(ies) shall be in accordance with the manufacturer's instructions, and the Division's installation requirements. Installation of the backflow prevention assembly must be completed within the time specified in the notice to install or within forty-five (45) days of the water meter installation. A time extension may be granted by the City of Flagstaff provided no cross-connection hazards exist at the site.
13. A backflow prevention assembly for containment or landscape may need to have a pressure reducing valve upstream of it if the water line pressure is higher than eighty (80) psi. This does not apply to fire lines.

G. Installation of Backflow Prevention Assemblies for Fire Systems.

1. Fire protection systems may consist of sprinklers, hose connections, and hydrants for commercial, industrial or residential structures and services. Sprinkler systems may be dry or wet, open or closed. Systems consisting of fixed-spray nozzles may be used indoors or outdoors for protection of flammable-liquid and other hazardous processes. It is standard practice, especially in cities, to equip automatic sprinkler systems with fire department pumper connections.
2. A meter (compound, detector check) should not be permitted as part of a backflow prevention assembly. An exception may be made if the meter and backflow prevention assembly are specifically designed for that purpose.
3. For cross-connection control, fire protection systems shall be classified based on water source and arrangement of supplies as follows:
  - a. Class 1: Direct connections from public water mains only; no pumps, tanks or reservoirs; no physical connection from other water supplies; no antifreeze or other additives of any kind; all sprinkler drains discharging to atmosphere, dry wells or other safe outlets.
  - b. Class 2: Same as class 1, except that booster pumps may be installed in the connections from the street mains. It is necessary to avoid drafting so much water that pressure in the water main is reduced below twenty (20) psi.
  - c. Class 3: Direct connection from public water supply main plus one (1) or more of the following: elevated storage tanks; fire pumps taking suction from above-ground covered reservoirs or tanks; and pressure tanks (all storage facilities are filled or connected to public water only, the water in the tanks to be maintained in a potable condition). Class 3 systems will require minimum protection (approved double check valves) to prevent stagnant waters from backflowing into the public potable water system.
  - d. Class 4: Directly supplied from public mains like classes 1 and 2, and with an auxiliary water supply on or available to the premises; or an auxiliary supply may be located within one thousand seven hundred (1,700) feet of the pumper connection. Class 4 systems will require backflow protection at the service connection. The type (air gap or reduced pressure) will depend on the quality of the auxiliary supply.
  - e. Class 5: Directly supplied from public mains, and interconnected with auxiliary supplies, such as: pumps taking suction from reservoirs exposed to contamination, or rivers and ponds; driven wells, mills or other industrial water systems; or where antifreeze or other additives are used. Class 4 and 5 systems will need maximum protection (air gap or reduced pressure) to protect the public water system.
  - f. Class 6: Combined industrial and fire protection systems supplied from the public water mains only, with or without gravity storage or pump suction tanks. Class 6 system protection would depend on the requirements of both industry and fire protection and could only be determined by a survey of the premises.
4. Installation of Assembly.

a. When a backflow assembly is required for a water service connection supplying water only to a fire system, the assembly shall be installed on the service line in compliance with standard specifications adopted by the City. Installation of DC or DCDVA may be allowed on fire systems with the City of Flagstaff approval provided both the manufacturer's specifications and U.S.C. approval allow such an installation.

b. RP's for fire line assemblies may be installed inside a fire riser room provided they have an adequate drain for a full port discharge for the size of the assembly per the manufacturer's specifications into the sanitary sewer system, not the storm water system. If a drain cannot be provided that can contain a full port discharge to the sanitary sewer system from a fire line with chemical additives such as anti-freeze or glycerin, the assembly must be installed outside the building in an insulated enclosure with electricity for a heat source for freeze protection and a check valve must be installed in the system to prevent the discharge of antifreeze onto the ground.

5. All backflow assemblies installed on fire sprinkler systems shall have a chain with a padlock from the first O.S. & Y. valve to the second O.S. & Y. valve, or an operable alarm system or both.

6. For looped fire lines, a DC or RP backflow prevention assembly is required on both ends of a private water main that is connected to the public water services at two (2) or more locations.

#### H. Removal Requirement.

1. It shall be unlawful for any person to alter, modify, bypass or remove a backflow prevention method without the written approval of the division.

2. If a device is removed without the approval of the City, the City reserves the right to visually inspect the piping to verify there is a physical separation and/or no piping is connected before an existing backflow assembly.

3. The device and piping shall be removed as close as possible to the main service connection and any property connections to mitigate the possibility of stagnating water in the piping.

4. A device will not be deactivated in the City's records unless there is a physical separation between the piping and no possibility of connecting the two (2) ends. An inspection of the removal by the City will need to be completed before removal from the records.

#### I. Inspections.

1. A customer's water system shall always be available during business operations for premises inspection by City of Flagstaff personnel and backflow prevention assembly testing, if necessary. The inspection shall be conducted to determine whether any cross-connection or other hazard potentials exist and to determine compliance with this chapter and modifications.

2. City of Flagstaff shall inspect all new sites, assembly installations, assembly relocations, assembly removal and assemblies that have been repaired for compliance.
3. A waived premises is a property for which the City of Flagstaff has determined there are currently no hazard potentials. All waived premises shall be inspected periodically or when there has been a change in owner/tenant or there has been a use change.
4. If a customer refuses entry to a premises for inspection during business operations, the City of Flagstaff may discontinue water service, require backflow prevention or take any steps allowed by law to gain entry to the premises.

J. Authorization.

1. Installation authorizations for the installation of all backflow prevention assemblies required by the City of Flagstaff shall be obtained from the City of Flagstaff prior to installation.
2. It shall be the duty of the person doing the work to notify the City of Flagstaff, in writing, that the work is ready for inspection. Such notification shall be given not less than twenty-four (24) hours before the work is to be inspected and shall be given only if there is reason to believe that the work done will meet current City codes and regulations.
3. Whenever any work is being done contrary to the provisions of the City's adopted plumbing code or this chapter, the City of Flagstaff or an authorized representative may order the work stopped by notice in writing served on any persons engaged in the doing or causing such work to be done; and any such person shall forthwith stop such work until authorized by City of Flagstaff to proceed with the work.

K. Maintenance and Testing.

1. The annual test compliance date shall be set by the City of Flagstaff Industrial Waste Section. The consumer shall have backflow prevention assemblies tested upon installation and at least once per year, or more frequently if deemed necessary by the Division, at the consumer's expense. If the Division determines that a health hazard exists, they may specify a more restrictive testing schedule.
2. The customer may request in writing a change of the annual test compliance date for any assembly. No compliance date may be changed to be more than twelve (12) months after the most recent test.
3. The consumer shall be responsible for maintenance of all backflow assemblies at his/her expense. If the Division or customer learns or discovers, during the interim period between tests that an assembly is defective or in unsatisfactory operating condition, the customer shall arrange for repairs. The customer shall have any necessary repairs performed by an appropriately licensed contractor, including replacement or overhaul of the assembly, if necessary, which will return the assembly to satisfactory operating condition within thirty (30) days of discovery. Such assembly shall be retested within thirty (30) days following repairs, until testing reveals no defects or unsatisfactory operating conditions.
4. All testing shall be performed by an individual who holds a valid "General" Tester Certification issued by the California-Nevada American Water Works Association (Cal-Nev

AWWA), the Arizona State Environmental Technical Training (ASETT) Center, or other certifying authority approved by the Division. A list of certified testers registered with the City of Flagstaff shall be available upon request to all persons required to install or maintain a backflow prevention assembly. Test procedures shall be performed as required by the ADEQ as set forth in the most current edition of the USC-FCCCHR Manual of Cross-Connection Control. The tester shall provide a copy of the test report to the customer and to the City of Flagstaff Industrial Pretreatment Section within five (5) working days from the date of the test and shall maintain a copy for their records for at least three (3) years.

5. No existing backflow prevention assembly shall be altered, disconnected or replaced without prior approval of the Division.
6. During construction, any new backflow assemblies must be tested before the water is used for any purpose, including construction uses.
7. Test cocks are to be used for testing only and shall be installed in accordance with Division requirements. Any unauthorized use of these test cocks is a violation of this code.
8. Each backflow prevention assembly shall be easily identified by displaying the following in a conspicuous manner on the assembly:
  - a. Manufacturer.
  - b. Model Number.
  - c. Serial Number.

This information must also be provided to the Division by the consumer promptly upon installation.

9. The customer shall maintain records of the results of all tests and all servicing, repairs, or replacements of the backflow prevention assembly. A copy of the records shall be provided to the City of Flagstaff within five (5) days after completion of the activity for which the record is made.
10. The consumer shall notify and receive approval from the City of Flagstaff Fire Marshal, at least twenty-four (24) hours in advance, of any maintenance or testing performed upon assemblies installed upon fire sprinkler systems which requires discontinuance of water supply to that system. Fire systems shall not be out of service for more than eight (8) consecutive hours due to testing, maintenance or repairs. The fire department shall be notified immediately of any changes in fire service status.
11. In lieu of discontinuance of service, City of Flagstaff may take action to install, test, repair, or replace a backflow device at the customer's point of service and bill the customer for all costs associated with the installation, test, repair, or replacement of a backflow prevention device.
12. The City of Flagstaff will return incomplete and erroneous test forms to the tester and customer for correction and resubmission by the compliance date. Information on submitted test forms can only be changed or modified by the tester who has signed the form and is

responsible for that test. Test reports must have a clear description of the location of the backflow device.

13. Test equipment shall be maintained and calibrated annually by an agency approved by the City of Flagstaff as required by the cross-connection manual. A copy of the annual equipment calibration certificates shall be submitted to the City of Flagstaff Industrial Pretreatment Section (or proctor) to maintain equipment registration and certification. Test equipment used on anything other than potable water backflow prevention assemblies shall not be used to test such assemblies and shall be identified as non-potable test equipment.

14. Testers shall register with the City of Flagstaff Industrial Pretreatment Section (or proctor) if they are conducting backflow assembly testing in City of Flagstaff service area. Testers shall submit a current copy of their certification or recertification upon registration. A City of Flagstaff registration issued to a backflow prevention assembly tester for testing backflow prevention assemblies in the City of Flagstaff service area may be revoked or suspended upon certification expiration or for improper testing, maintenance, reporting or other improper practices.

L. Enforcement.

1. Repealed by Ord. 2021-09. [THIS CHAPTER WILL BE ENFORCED PURSUANT TO THE GENERAL ENFORCEMENT PROVISIONS FOUND IN CHAPTER 7-01, AND ANY ADDITIONAL SPECIFIC ENFORCEMENT PROCEDURES SET FORTH HEREIN.](#)

2. When convicted of a violation of this chapter, any license previously issued to that person by the City may be revoked by the Flagstaff City Council or any proper court, if there may be reasonable relationship between the activities listed and the offense. Revocation of license shall not be considered a recovery of penalty so as to bar any other penalty being enforced.

3. The Division may deny or discontinue, after reasonable notice to the occupants thereof, the water service to anyone using the City of Flagstaff water distribution system or to any premises wherein any backflow prevention assembly or method required by these regulations is not installed, tested, maintained and repaired in a manner acceptable to the Division, or if required reports and/or records are not properly filed, or if it is found that the backflow prevention assembly or method has been removed or bypassed, or if an unprotected cross-connection exists on the premises. Reasonable notice shall be sent in writing at least two (2) weeks prior to the disconnection, unless the Division determines that a potential for a severe health hazard exists.

4. If the Division determines that a potential for a severe health hazard exists, the Division may immediately discontinue water service without notice. Notice by telephone will be given as soon as possible and written notice will be sent within five (5) days, following discontinuance of water service. Water service to such premises shall not be restored until the consumer has corrected or eliminated such conditions or defects in conformance with these regulations and to the satisfaction of the Division.

5. Fire sprinkler systems shall not be subject to disconnection without the explicit approval of the City Fire Marshal, but will be subject to other penalties as provided for in this chapter.

**7-03-001-0016 WATER RESOURCE DEVELOPMENT FEE**

New connections to the City water system shall pay the following Water Resource Development Fee for the purpose of retiring the debt required to develop water resources necessary to accommodate projected future City water demand. A customer increasing the meter size shall pay the difference between the water resource development fee for the new meter and that for the previous meter. No refund shall be made in the case of a reduced meter size. The Water Resource Development Fee shall expire on July 1, 2012.

**WATER RESOURCE DEVELOPMENT FEE**

**FOR**

**PURCHASE OF RED GAP RANCH**

<b>METER SIZE (INCHES)</b>	<b>(EFFECTIVE 1-1-07)</b>	<b>(EFFECTIVE 1-1-08)</b>	<b>(EFFECTIVE 1-1-09)</b>
3/4 X 5/8	\$462	\$938	\$1,400
1	\$792	\$1,608	\$2,400
1-1/2	\$1,551	\$3,149	\$4,700
2	\$2,475	\$5,025	\$7,500
3	\$5,148	\$10,452	\$15,600
4	\$7,953	\$16,147	\$24,100
6	\$15,444	\$31,356	\$46,800

**7-03-001-0017 PURCHASED ENERGY COST FOR WATER**

Whenever the City of Flagstaff's purchased power (electric fuel and/or natural gas) expense in any of its water systems increases or decreases, or will increase or decrease, from the amount adopted by the City Council in the WATER SERVICES Utilities last general rate proceeding for that system, the Utility may adopt a new energy charge schedule designed to recover such increased or decreased purchase power expense, provided that:

- A. The total amount of the increase or decrease in purchased power expense will be calculated by comparing the WATER SERVICES Utilities normalized cost for power during the test year utilized in the last rate case with the WATER SERVICES Utilities normalized cost of power for the test year computed at the WATER SERVICES Utilities new increased or decreased cost of power.
- B. The total purchased power expense for water will be divided by the total gallonage sold during the test year to determine the Water Energy Cost (WEC) per 1000 gallons.
- C. The calculated increase or decrease in rates for the system must amount to at least \$0.01 per 1000 gallons before an adjustment can be made.

E. **WATER SERVICES** Utilities Division staff and the Finance department will annually calculate the energy charge amount for the water system based on the last twelve (12) month rolling average of water related power costs.

F. The WEC shall be approved annually prior to November 30 through the City Manager. In the first year of implementation the rate will not be adjusted due to partial fiscal year revenues. Revenues from the WEC fee will be posted to a separate revenue account.

G. The new Water Energy Cost amount will become effective on January 1st of each year.

H. The Water Energy Cost shall be determined by the estimated total energy cost projected for the current fiscal year for water adjusted by actual prior fiscal year WEC account surplus or deficit divided by the current fiscal year projected water sold.

$$\text{WEC} = \text{Total Annual Energy Cost} / \text{Total Annual Water Sold}$$

Illustration of the Water Energy Charge calculation assuming the following test year data:

1. 2,500,000 TG Gallons Sold during past TWELVE (12) months per ONE THOUSAND (1000) gal.
2. \$1,875,000 Purchase Power Expense (Gas, Fuel, Electric)
3. \$0 Prior fiscal year WEC account end balance

The Water Energy Charge Pass Thru Calculation steps would be

$$\text{WEC} = (\$1,875,000 - \$0) / 2,500,000 = \$0.75 \text{ per TG}$$

**7-03-001-0018 RECLAIMED WATER RATE SCHEDULE**

There shall be charged the following rates for all reclaimed water furnished consumers and measured by meter on any service connection with City reclaimed water mains for and during each monthly billing period.:

A. The base monthly service charge applies whether the reclaimed water meter is active or inactive. The monthly service charge is based on the fixed cost of operation and maintaining the reclaimed water system so that the system is available to provide water to the parcel when water service is activated. Parcels with shutoff reclaimed water meters will continue to pay base monthly service fee since water service is available and may be activated and used by the property owner at any time. Reclaimed water monthly service charge equal to water monthly service charge, see Section 7-03-001-0011.:

**VOLUME CHARGE**

Monthly Water Use Gallons	Volume Charge \$/1,000 gal		
	1-1-18	1-1-19	1-1-20 <sup>(4)</sup>
Single-Family			

Monthly Water Use Gallons	Volume Charge \$/1,000 gal		
	1-1-18	1-1-19	1-1-20 <sup>(4)</sup>
Tier 1 0—3,500	1.30	1.36	1.43
Tier 2 3,500—6,200	1.60	1.69	1.77
Tier 3 6,200—11,500	2.32	2.44	2.56
Tier 4 Over 11,501+	4.35	4.58	4.80
Commercial (no main ext)	1.71	1.83	1.95
Commercial (with main extension)	3.62	3.88	4.14
Manufacturing (no main ext)	1.69	1.81	1.93
Manufacturing (with main ext)	3.59	3.84	4.10
Northern Arizona University (no main extension)	1.59	1.70	1.82
Northern Arizona University (with main extension)	3.40	3.62	3.85
City Departmental	1.71	1.83	1.95
Standpipe-Hydrant Meter	3.70	3.85	4.00
Off-Peak/Golf Course Rate			
Tier 1 (0—150,000,000)	1.47	1.56	1.65
Tier 2 (Over 150,000,000)	1.26	1.45	1.65

<sup>(4)</sup>—Rates shown in table above are projected based on current potable water rates and the energy surcharge rate of eighty-three cents (\$0.83) per one thousand (1,000). Actual rates will be adjusted if necessary based on subsection (B) of this section.

B. Automatic Rate Adjustments Effective January 1, 2020. The City agrees to adopt a rate schedule which provides for automatic adjustments to reclaimed water rates based on changes to the potable water rate. Automatic adjustments to the energy surcharge component of potable water rates cause the reclaimed water rate to fluctuate each year.

1. Reclaimed water rates shall be set at thirty-five percent (35%) of potable water rates including **PLUS** energy cost component for all classes of customers that do not require a main extension, after 2020.
2. Reclaimed water rates shall be set at seventy-five percent (75%) of potable water rates **PLUS ENERGY COST COMPONENT** for all classes of customers that require a main extension, after 2020.
3. Standpipe-hydrant meter rates shall be set at fifty percent (50%) of the equivalent customer potable water rates including **PLUS** energy cost component after 2020.
4. Off-peak Tier 1 customer rates shall be set at eighty-seven percent (87%) of commercial reclaimed water rates **PLUS ENERGY COST COMPONENT**.

5. Energy Cost Adjustment. City reserves the right to automatically pass along future increases in reclaimed water rates based on energy cost adjustments to the potable water rate.

6. Adjustments shall begin on January 1st of each calendar year and continue through the end of the year.

**ORDINANCE NO. 2024-19**

**AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF FLAGSTAFF, AMENDING THE FLAGSTAFF CITY CODE, TITLE 3, BUSINESS REGULATIONS, SECTION 3-10-001-0008 LICENSE FEES AND TITLE 7, HEALTH AND SANITATION, CHAPTER 7-02 WASTEWATER REGULATIONS AND CHAPTER 7-03 WATER REGULATIONS, BY ADOPTING BY REFERENCE THAT CERTAIN DOCUMENT ENTITLED “*WATER SERVICES RATES CODE CHANGES*”; PROVIDING FOR PENALTIES, REPEAL OF CONFLICTING ORDINANCES, SEVERABILITY, AND ESTABLISHING AN EFFECTIVE DATE**

**RECITALS:**

WHEREAS, ARS §§9-511, 9-511.01 *et. seq.* provides authority for municipalities to adjust water, wastewater, and reclaimed water utility rates and fees and water and wastewater capacity charges, and

WHEREAS, water and wastewater capacity charges are established for the purpose of charging the cost of additional system capacity to new customers; and

WHEREAS, service charges and fees are established to charge the user of a specific service the cost of delivering the specific service; and

WHEREAS, the City of Flagstaff (“City”) has found that it is necessary to update, adjust and increase water, wastewater, and reclaimed water service fees and charges in order to provide for the present cost of maintaining service levels and system capacity; and

WHEREAS, the City wishes to change language in the City Code, (1) Title 3, Business Regulations, Section 3-10-001-0008 License Fees and (2) Title 7, Health and Sanitation, Chapter 7-02 Wastewater Regulations, and Chapter 7-03 Water Regulations, to water, wastewater, and reclaimed water utility rates and fees and water and wastewater capacity charges in order to revise and update the City Code, and

WHEREAS, the City has finds that the updates, adjustments and increases to: the water, wastewater, and reclaimed water utility rates and fees and water and wastewater capacity charges are all just and reasonable.

**ENACTMENTS:**

**NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF FLAGSTAFF AS FOLLOWS:**

SECTION 1. That certain document known as “*Water Services Rates Code Changes*”, one(1) paper copy and (1) electronic copy of which are on file in the office of the City Clerk of the City of Flagstaff, Arizona, has been declared a public record by Resolution No. 2024-30 of the City of Flagstaff, Arizona, is hereby referred to, adopted and made a part hereof as if fully set out in this ordinance.

**SECTION 2. Repeal of Conflicting Ordinances**

All ordinances and parts of ordinances in conflict with the provisions of the code adopted herein are hereby repealed.

**SECTION 3. Severability**

If any section, subsection, sentence, clause, phrase or portion of this ordinance or any part of the code adopted herein by reference is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

**SECTION 4. Clerical Corrections**

The City Clerk is hereby authorized to correct clerical and grammatical errors, if any, related to this ordinance, and to make formatting changes appropriate for purposes of clarity, form, or consistency with the Flagstaff City Code.

**SECTION 5. Effective Date:**

This Ordinance shall be effective September 1, 2024 following adoption by the City Council.

PASSED AND ADOPTED by the City Council of the City of Flagstaff this 2nd day of July, 2024.

\_\_\_\_\_  
MAYOR

ATTEST:

\_\_\_\_\_  
CITY CLERK

APPROVED AS TO FORM:

\_\_\_\_\_  
CITY ATTORNEY

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Carmen Pryer, Real Estate Specialist  
**Co-Submitter:** Bryce Doty  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



**TITLE:**

**Consideration and Adoption of Ordinance No. 2024-18:** An ordinance of the City Council of the City of Flagstaff, authorizing the exchange of real property of substantially equal value with property owners, Gary G. and Mary Eileen Hundelt; providing for severability, authority for clerical corrections, and establishing an effective date; and

**Consideration and Approval of Purchase Agreement** with Gary G. and Mary Eileen Hundelt.

**STAFF RECOMMENDED ACTION:**

1. Read Ordinance No. 2024-18 by title only for the final time
2. City Clerk reads Ordinance No.2024-18 by title only (if approved above)
3. Adopt Ordinance No. 2024-18
4. Approve the Purchase Agreement and authorize the City Manager to execute the necessary documents.

**Executive Summary:**

This ordinance authorizes the exchange of real property of Substantially equal value: City remnant parcels originally acquired for the Lone Tree Overpass Project will be exchanged for real property interest needed for the same Project from Gary G., and Mary Eileen Hundelt. The exchange provides the following benefits to the City:

1. Disposes of remnant land no longer needed by City
2. Offsets the cost to acquire real property interests from Gary G., and Mary Eileen Hundelt
3. Returns remnant land back to tax base

The remnant properties were evaluated by the Housing Section as per Resolution 2022-52, and it was determined that the remnants are too small to be utilized as stand alone parcels for affordable housing. Additionally, City staff attending and internal property and development team meeting, representing multiple City divisions, did not identify any opposition to the exchange.

City Council is also being asked to consider approval of a Purchase Agreement, which includes terms and conditions of the exchange. The Purchase Agreement is attached to this staff report. The City will be paid \$409.00. The City will pay escrow fees and expenses. City also commits to ensuring continued property access as part of the Lone Tree Overpass Project.

**Financial Impact:**

The Lone Tree Overpass Project (north of Butler Avenue) is currently budgeted in FY2021-2022 in the amount of \$8,686,681 in the Transportation Fund, Account Number 047-05-112-3054-6. The Lone Tree Corridor Project (south of Butler Avenue) is currently budgeted in FY2021-2022 in the amount of \$250,000 in the Transportation Fund, Account Number 048-05-118-3495-6. Both funds will be utilized to complete the attached Project scope from Route 66 to Sawmill Road.

The areas to be exchanged have been valued at substantially equal value.

Gary G. Hundelt and Mary Eileen Hundelt agree to sell to the City of Flagstaff 282 square feet of fee in the amount of \$11,421.00. (as shown on exhibit A)

2. As part of this Agreement the City of Flagstaff agrees to exchange to Gary G. Hundelt and Mary Eileen Hundelt 1,183 square feet of fee in the amount of \$11,830.00. (as shown on exhibit B)

Fee 104-01-024 Exhibit A 282 sq/ft @ 40.50 sq/ft \$11,421.00

Fee 104-01-023 Exhibit B 1,183 sq/ft @ \$10.00 sq/ft - \$ 11,830.00

Total to be paid to the City of Flagstaff \$ 409.00

**Policy Impact:**

None

**Previous Council Decision or Community Discussion:**

On May 16, 2023 Council approved Ordinance 2023-13 authorizing acquisition of this property, including others for the Lone Tree Overpass Project.

**Options and Alternatives to Recommended Action:**

1. Retain City remnant parcels, and pay full appraised value for real property interests needed from Gary G. and Mary Eileen Hundelt.
2. Dispose or use City remnant parcels at a later date.

**Background and History:**

The Lone Tree Overpass has been a planned project for over a decade in the Flagstaff community. The Lone Tree Overpass Study, which evaluated conceptual design options for the bridge was completed in 2010. The goal of the project is to provide better connectivity for our transportation network and provide a grade-separated crossing which increases safety and convenience for commuters.

The Overpass also coordinates with the future planned improvements of the Lone Tree Corridor reconstruction which was studied in a report completed in 2006. The Lone Tree Corridor and Overpass serves to connect the southern area of town with the Route 66 corridor and provides a option that reduces congestion on other roadway corridors.

A portion of the Lone Tree Corridor from Sawmill Road to Butler Avenue is included in this Overpass design. This section of the corridor was included at this time to provide a coordinated improvement north and south of the Butler Avenue Intersection.

In November 2018, the Flagstaff voters approved a ballot measure to fund the Overpass (Proposition 420) and a separate ballot measure to fund the Corridor Improvements (Proposition 419). Both propositions passed.

On August 21, 2020, the City issued a Request for Statements of Qualifications (RSOQ) from Arizona Registered Contractors for a Design-Builder to provide design and construction services for the Overpass.

On September 24, 2020, the City received four responses to the Request for Statements of Qualifications (RSOQ). Upon the completion of the evaluation process, Ames was determined to be the most qualified Design-Builder to perform the work.

On February 2, 2021, City Council awarded the Design-Build Services Agreement for Phase I of the project development to Ames Construction.

On July 6, 2021, Council passed Ordinance 2021-15, authorizing acquisition of real property for the Project.

**Connection to PBB Priorities and Objectives:**

**Safe and Healthy Community**

- Foster a safe, secure, and healthy community.
- Ensure the built environment is safe through the use of consistent standards, rules and regulations, and land use practices.

**Connection to Regional Plan:**

- Improve transportation safety and efficiency for all modes.

**Connection to Carbon Neutrality Plan:**

None

**Connection to 10-Year Housing Plan:**

None

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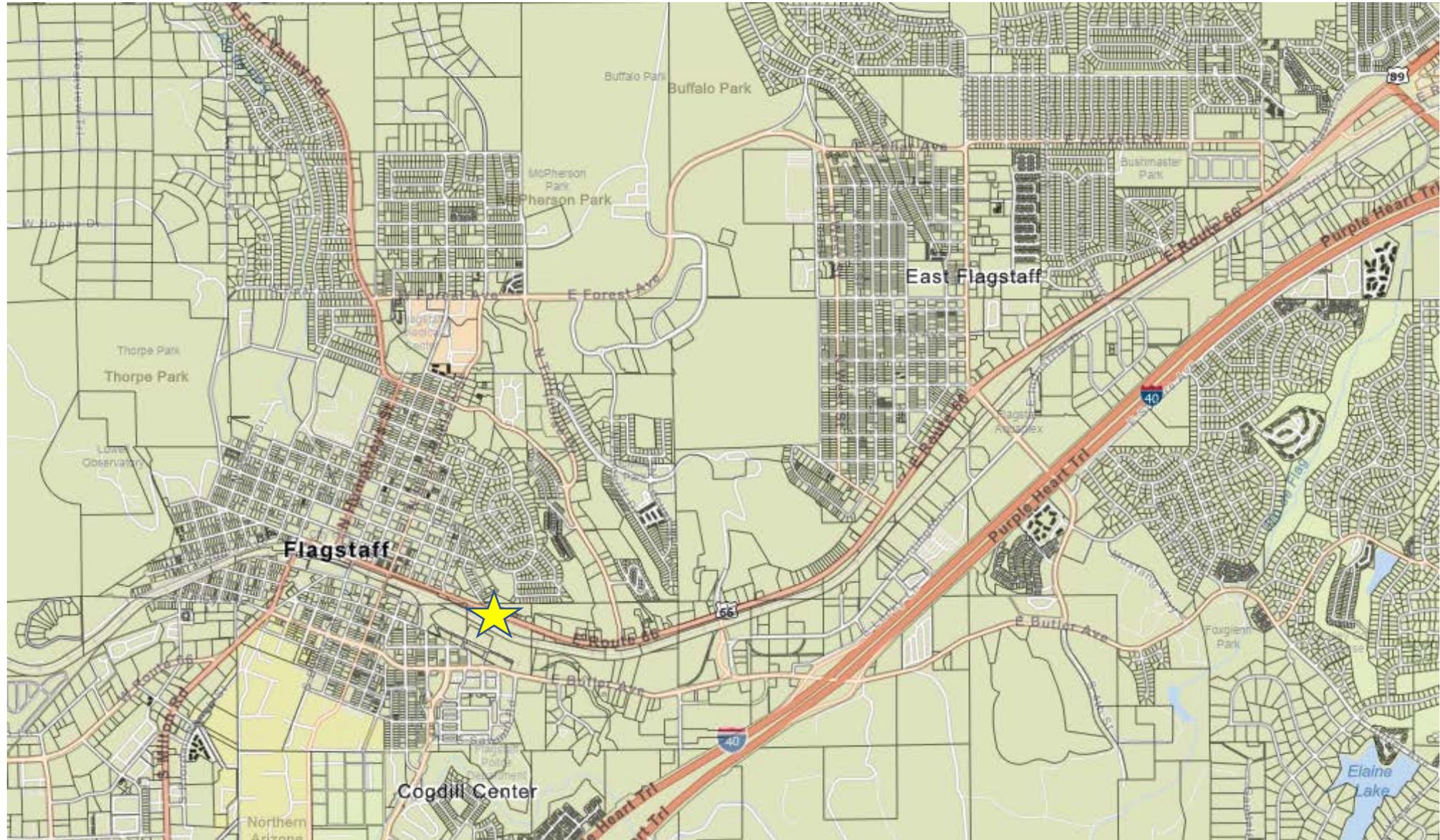
**Attachments:**    [Presentation](#)  
                          [Ord. 2024-18](#)  
                          [Exhibit A & A1 - Legal Description 1,183 sf.](#)  
                          [Exhibit B - Legal Description 282sf.](#)  
                          [Exhibit C - Map](#)  
                          [Purchase Agreement](#)

# LTO Hundelt Exchange





# Vicinity Map

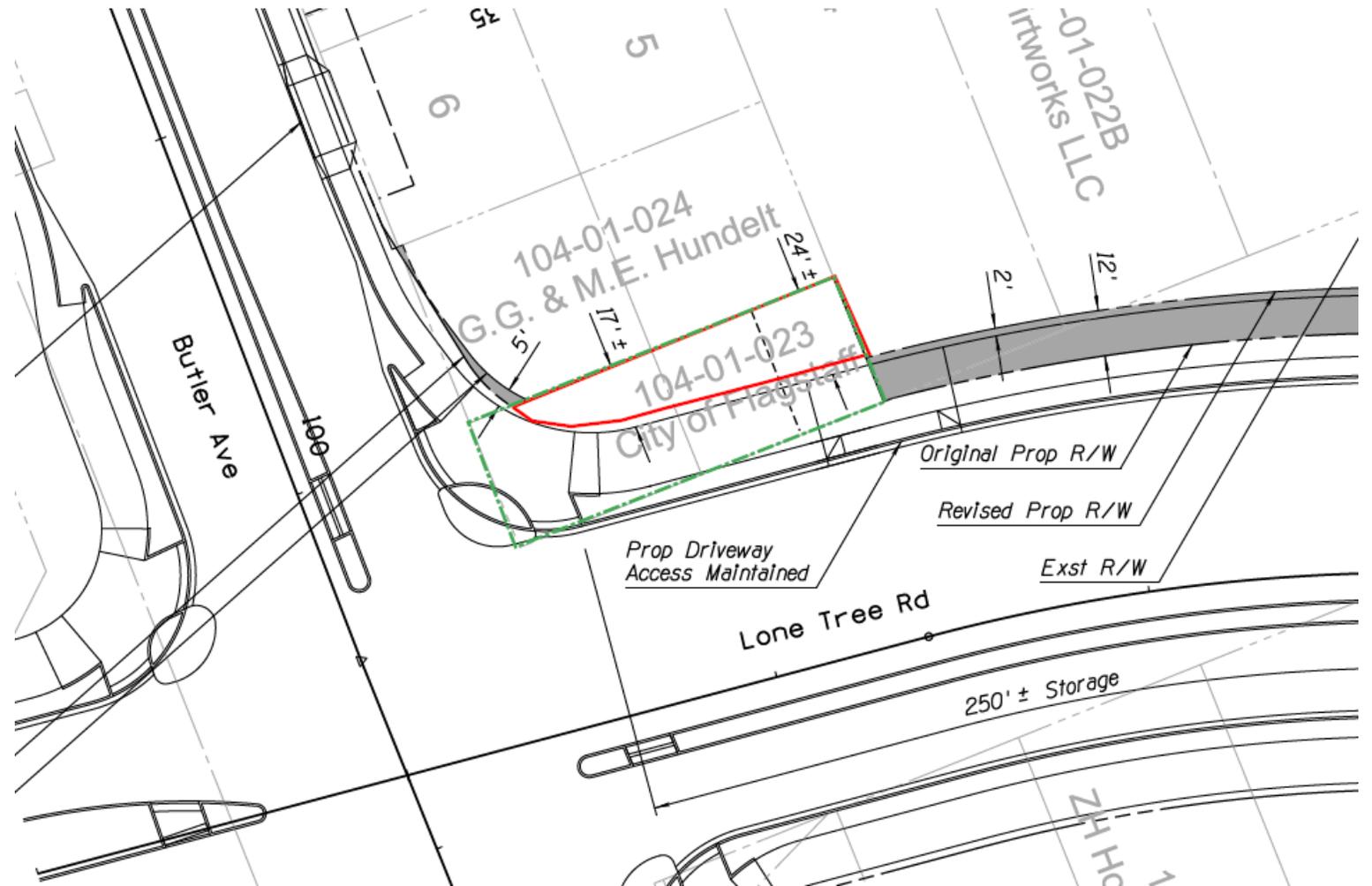






# Background

- City purchased entirety APN 104-01-023 for Lone Tree Overpass (LTO) (Green outline)
- LTO does not need the red highlighted portion of parcel (1,183 SQFT)
- LTO does need 282 SQFT on adjacent parcel 104-01-024 owned by the Hundelts
- Hundelt's would like to partially exchange what is needed on their property for the excess lands on the City parcel





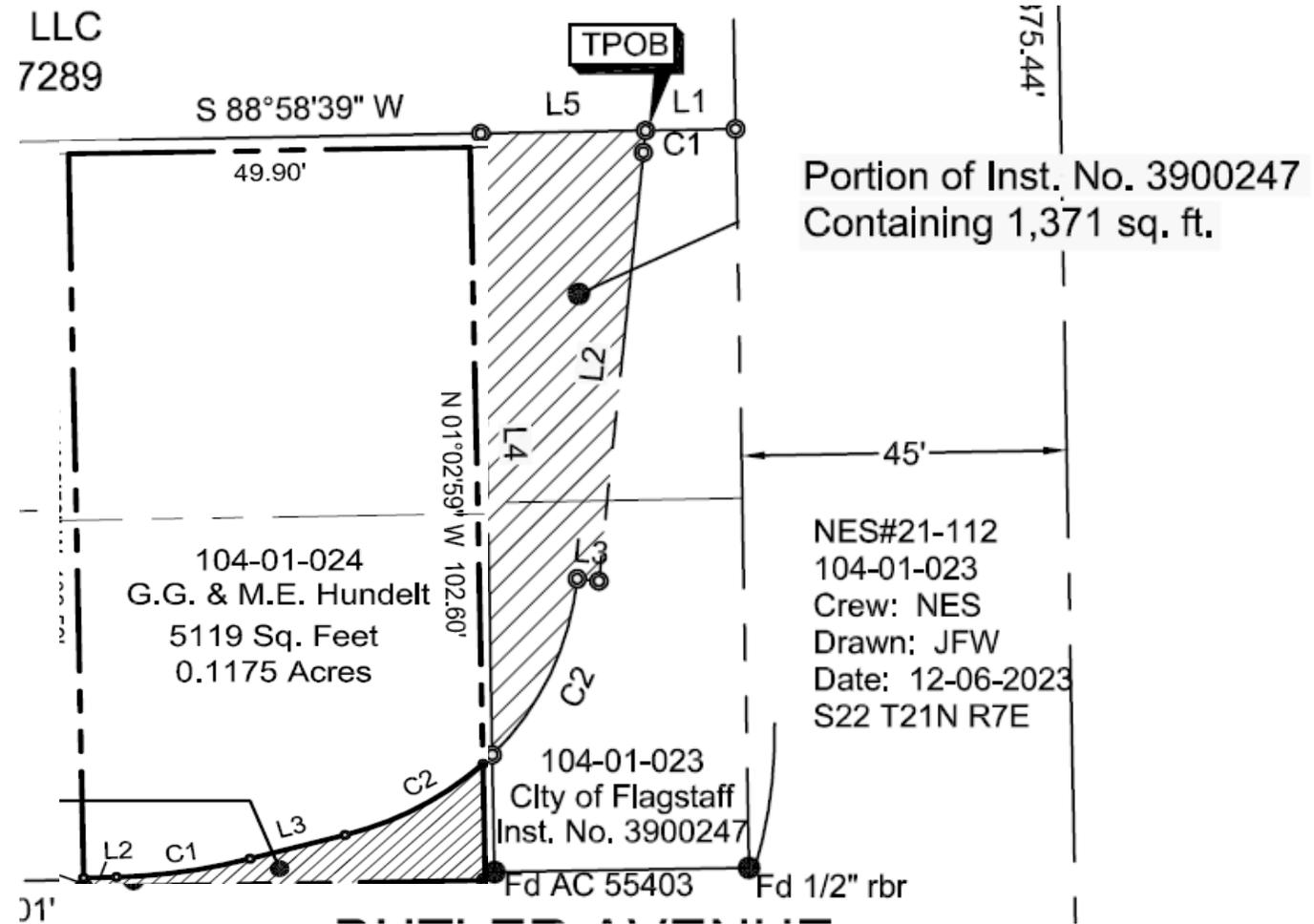
# Background





# Considerations

- Both properties LI zoning
- Limited alternative uses for such a small remnant piece.
- As vacant a maintenance liability



**ORDINANCE NO. 2024-18**

**AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF FLAGSTAFF, AUTHORIZING THE EXCHANGE OF REAL PROPERTY OF SUBSTANTIALLY EQUAL VALUE, WITH PROPERTY OWNERS GARY G. AND MARY EILEEN HUNDELT; PROVIDING FOR SEVERABILITY, AUTHORITY FOR CLERICAL CORRECTIONS, AND ESTABLISHING AN EFFECTIVE DATE**

**RECITALS:**

WHEREAS, the City Council has authority to acquire and exchange real property of substantially equal value, pursuant to the Flagstaff City Charter, Article I, Section 3 and A.R.S. Section 9-407; and

WHEREAS the City desires to receive property necessary for the Lone Tree Overpass Project in exchange for City property and has published a notice of intent to exchange property.

**ENACTMENTS:**

**NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF FLAGSTAFF AS FOLLOWS:**

**SECTION 1. In General**

The City of Flagstaff hereby authorizes the exchange of properties of substantially equal value, to consist of a City grant of approximately 1,183 square feet of land to, Gary and Mary Hundelt, husband and wife, as joint tenants with right of survivorship, as legally described and depicted in the attached Exhibits A and A-1, in exchange for a Gary and Mary Hundelt grant of 282 square feet of land to the City for the Lone Tree Overpass Project, as legally described and depicted in the Attached Exhibit B, with Gary and Mary Hundelt to pay the City an additional sum of \$409.00 for the exchange, all pursuant to a separate Purchase Agreement approved by City Council. A map depicting the exchange is attached hereto as Exhibit C.

All ordinances and parts of ordinances in conflict with the provisions of the code adopted herein are hereby repealed.

**SECTION 2 Delegation of Authority**

The Mayor, City Manager, City Attorney, City Clerk, Finance Director, Real Estate Manager, or their designees are hereby delegated authority to take all actions necessary and appropriate to complete the transactions approved in this ordinance.

**SECTION 3 Repeal of Conflicting Ordinances**

All ordinances and parts of ordinances in conflict with the provisions of the code adopted herein are hereby repealed.

**SECTION 4 Severability**

If any section, subsection, sentence, clause, phrase or portion of this ordinance or any part of the code adopted herein by reference is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

**SECTION 5. Clerical Corrections**

The City Clerk is hereby authorized to correct clerical and grammatical errors, if any, related to this ordinance, and to make formatting changes appropriate for purposes of clarity, form, or consistency with the Flagstaff City Code.

**SECTION 6. Effective Date**

This Ordinance shall be effective thirty (30) days following adoption by the City Council.

PASSED AND ADOPTED by the City Council of the City of Flagstaff this of July 2nd, 2024.

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MAYOR

ATTEST:

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CITY CLERK

APPROVED AS TO FORM:

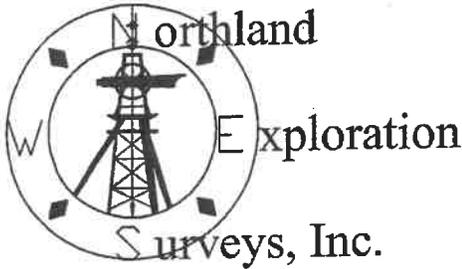
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CITY ATTORNEY

**Attachments:**

- Exhibits A and A-1     Legal description and depiction, (1,183 square feet)
- Exhibit B                Legal description, (282 square feet)
- Exhibit C                Map depicting exchange

**\*\*Exhibits are on file with the "Flagstaff City Clerk\*\***



# EXHIBIT "A"

A portion of that parcel of land recorded in Inst. No. 3900247, Records of Coconino County (R1), being a portion of Block 25 of the Revised plat of Brannen Addition as recorded in Book 1, Page 42, Records of Coconino County, situated in Section 22, Township 21 North, Range 7 East, Gila and Salt River Meridian, Coconino County, Arizona

## LEGAL DESCRIPTION:

A portion of that parcel of land recorded in Inst. No. 3900247, Records of Coconino County (R1), being a portion of Block 25 of the Revised plat of Brannen Addition as recorded in Book 1, Page 25, Records of Coconino County, situated in Section 22, Township 21 North, Range 7 East, Gila and Salt River Meridian, Coconino County, Arizona, said portion being more particularly described as follows:

FROM the northeast corner of that parcel of land recorded in Inst. No. 3707289, R.C.C. (R2), said point being a found 1/2" rebar, thence S 01° 02' 18" E [Basis of Bearings: Grid per State Plane Zone Arizona Central (0202)], along the east line of said Block 25 Brannen Addition, for a distance of 139.04 feet to the northeast corner of said parcel recorded in Inst. No. 3900247 (R1);

thence S 88° 58' 39" W, along the north line of said parcel (R1), for a distance of 15.47 feet to a non-tangent point of curvature, said point being the TRUE POINT OF BEGINNING;

thence southwesterly along a curve to the left, having a central angle of 0° 16' 08" and a radius of 573.00 feet, for a distance of 2.69 feet, the chord of said curve bears S 06° 01' 29" W a distance of 2.69 feet to a point of tangency;

thence S 05° 53' 25" W for a distance of 59.83 feet to a point of curvature;

thence southwesterly along a curve to the right, having a central angle of 39° 38' 11" and a radius of 40.00 feet, for a distance of 27.67 feet, the chord of said curve bears S 25° 42' 31" W a distance of 27.12 feet to a non-tangent point, said point being on the west line of said parcel (R1);

thence N 01° 02' 59" W, along the said west line (R1), for a distance of 86.29 feet to a point, said point being the northwest corner of said parcel (R1);

thence N 88° 58' 39" E, along the said north line of parcel (R1), for a distance of 19.77 feet to the TRUE POINT OF BEGINNING,

said parcel of land contains 1,183 square feet of land, more or less, including any easements of record over the above described parcel, as shown on Exhibit "A-1", which is made a part hereof by this reference.



CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	2.69'	573.00'	0°16'08"	S 06°01'29" W	2.69'
C2	27.67'	40.00'	39°38'11"	N 25°42'31" E	27.12'

# EXHIBIT "A-1"

A portion of Section 22, Township 21 North, Range 7 East, Gila and Salt River Meridian, Coconino County, Arizona

CURVE DATA:

N 88°56'25" E 150.15'

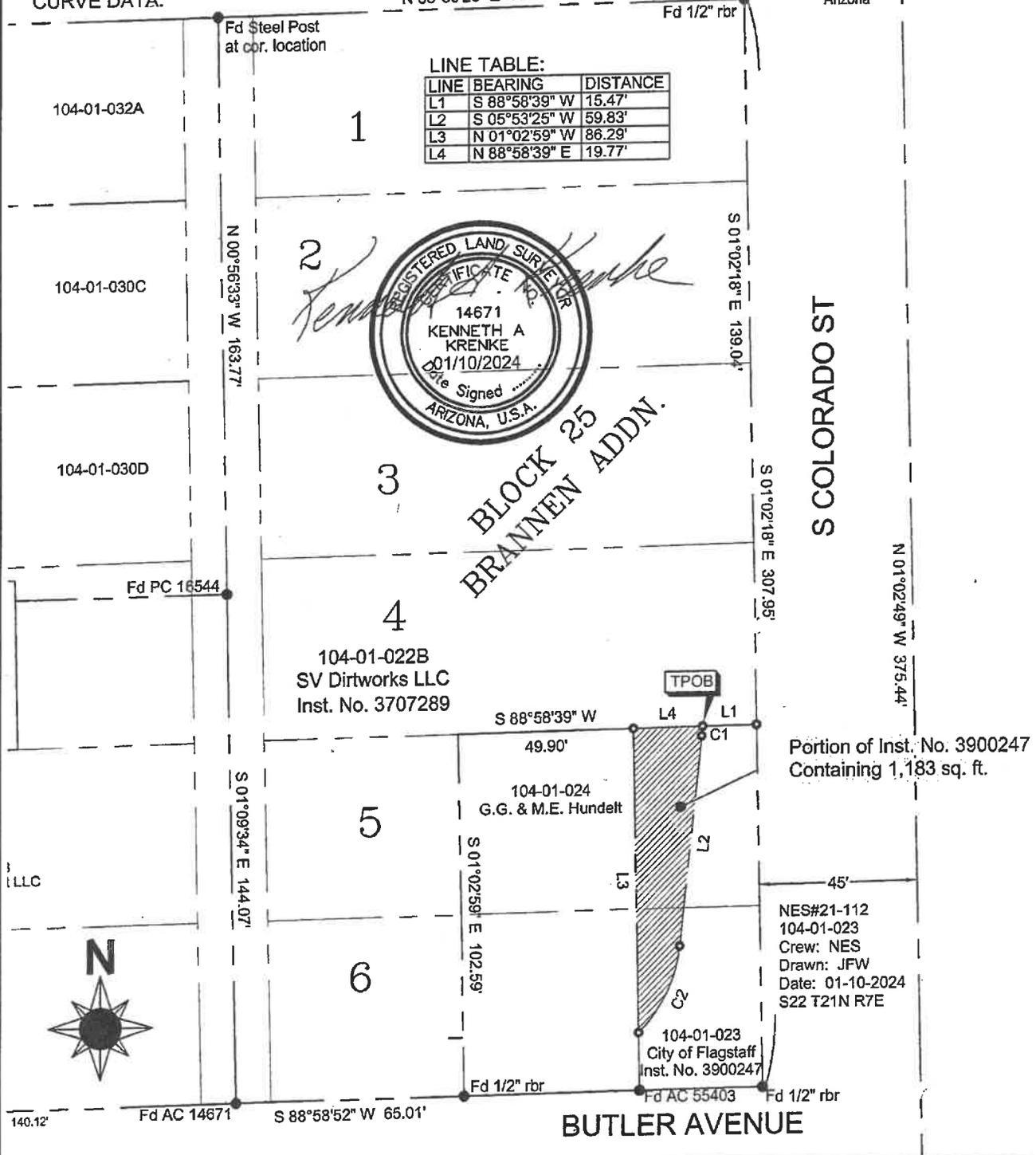
LINE TABLE:

LINE	BEARING	DISTANCE
L1	S 88°58'39" W	15.47'
L2	S 05°53'25" W	59.83'
L3	N 01°02'59" W	86.29'
L4	N 88°58'39" E	19.77'



**BLOCK 25  
BRANNEN ADDN.**

**S COLORADO ST**



Scale: 1" = 40'      Date: 01/10/2024      Job No. 21-112

Exhibit "B"

# EXHIBIT "A"

A portion of that parcel of land recorded in Inst. No. 3805360, Records of Coconino County, being a portion of Lots 5 and 6, Block 25 of Brannen Addition to the Town of Flagstaff, as recorded in Book 1, Page 12 and revised in Book 1, Page 42, R.C.C., situated in Section 22, Township 21 North, Range 7 East, Gila and Salt River Meridian, City of Flagstaff, Coconino County, Arizona

## LEGAL DESCRIPTION:

A portion of that parcel of land recorded in Instrument No. 3805360, Records of Coconino County (R1), being a portion of Lots 5 and 6, Block 25 of Brannen Addition to the Town of Flagstaff, as recorded in Book 1, Page 12 and revised in Book 1 of Maps, Page 42, R.C.C., situated in Section 22, Township 21 North, Range 7 East, Gila and Salt River Meridian, City of Flagstaff, Coconino County, Arizona, said portion being more particularly described as follows:

BEGINNING at the Southwest corner of said parcel of land (R1), said point being a found 1/2" rebar, thence N 01° 02' 59" W [Basis of Bearings: Grid per State Plane Zone Arizona Central (0202)], along the west line of said parcel (R1), for a distance of 1.23 feet to a point;

thence N 88° 18' 31" E for a distance of 4.07 feet to a point of curvature;

thence northeasterly along a curve to the left, having a central angle of 14° 06' 43" and a radius of 68.42 feet, for a distance of 16.85 feet, the chord of said curve bears N 81° 15' 10" E for 16.81 feet to a point of tangency;

thence N 74° 11' 48" E for a distance of 12.26 feet to a point of curvature;

thence northeasterly along a curve to the left, having a central angle of 28° 40' 12" and a radius of 40.00 feet, for a distance of 20.02 feet, the chord of said curve bears N 59° 51' 42" E for 19.81 feet to a point, said point being on the east line of said parcel of land (R1);

thence S 01° 02' 59" E, along the said east line, for a distance of 16.31 feet to a point, said point being on the South line of said parcel of land (R1), also being the said north Right-of-way line of Butler Avenue;

thence S 88° 58' 52" W, along the said north Right-of-way line of Butler Avenue, for a distance of 46.13 feet to the TRUE POINT OF BEGINNING;

said parcel of land contains 282 square feet of land, more or less, including any easements of record over the above described parcel, as shown on Exhibit "A-1", which is made a part hereof by this reference.

NES #21-112\_FEE\_104-01-024



Exhibit XX



**PURCHASE AGREEMENT**

Title Company Pioneer Title Agency, Inc. Date \_\_\_\_\_  
 Address 100 N. Elden Street (to be completed by Title Company, if applicable)  
 City Flagstaff Arizona Zip Code \_\_\_\_\_  
 Escrow Officer Cabrina Zweifel Phone 928-779-0371  
 Escrow No. \_\_\_\_\_ Email cabrina.zweifel@ptaaz.com  
 Grantor Gary G. Hundelt and Mary Eileen Hundelt, husband and wife, as joint tenants with right of survivorship  
 Mailing Address \_\_\_\_\_  
 Phone 602-502-3959 Mobile \_\_\_\_\_ Email tim@theblue-az.com

Grantee: CITY OF FLAGSTAFF (the "City")  
 Mailing Address: 211 West Aspen, Flagstaff, AZ 86001

The CITY shall pay directly to the Grantor, or deposit with the Title Company ("Escrow Agent") if escrowed, the purchase price plus all lawful costs incidental to closing as follows:

Escrow Fees	_____	
Title Policy Fees	_____	
<b>TOTAL ESCROW &amp; TITLE FEES</b>		<u>\$0.00</u>
<b>Recording Fees</b>		
Deed	_____	
Easement	_____	
Release	_____	
	_____	
<b>TOTAL RECORDING FEES</b>		<u>\$0.00</u>
<b>Other Charges</b>		
Release Fees	_____	
Title Report Fee	_____	
Prorated Taxes/Dates	_____	
	_____	
<b>TOTAL OTHER CHARGES</b>		<u>\$0.00</u>
Subtotal Fees		<u>\$0.00</u>
Title Report Credit (-)		
<b>Total Closing Costs</b>		<u>\$0.00</u>
Land and Improvements*		<u>\$11,421.00</u>
COF Land Exchange		<u>\$ (11,830.00)</u>
<b>Total Purchase Price</b>		<u>\$ (409.00)</u>
<b>TOTAL WARRANT**</b>		<u>\$0.00</u>

Charges and disbursements to be paid from Grantor's funds as follows (check all that apply):

- Total Acquisition of Grantor's Property:** Full release of all monetary liens and encumbrances, and leases of any kind. Pay in full all due and delinquent real property taxes and general and special improvement assessments. Grantor will be charged for any costs necessary to make the property compliant with the Covenants, Conditions and Restrictions. Prorate the current year's real property taxes on closings that occur on or after the 3<sup>rd</sup> Monday of August each year. Escrow Agent shall withhold the prorated amounts from each party and pay the lien of the current year's taxes in full.
- Partial Acquisition of Grantor's Property:** Partial release of all monetary liens and encumbrances, and leases of any kind. At the discretion of the City, pay due and delinquent property taxes and general and special improvement assessments, including full payment of taxes and assessments on individual assessor parcels within City's partial acquisition, and any Certificate(s) of Purchase. The current year's taxes shall not be prorated regardless of the closing date.
- Easement(s):** Consent to permanent easement(s) by secured party(ies).
- Other Disbursements:**
- Security Deposits and Prepaid Rents, if Applicable:** Grantor agrees to return all security deposits and prepaid rents directly to lessee(s) outside of escrow.  
 \*\*\*\*\*
- Possession Date:** Close of escrow/date of recording.
- Special Conditions Right of Way Contract Yes  No
- Entry Agreement\*\*\* Yes  No
- \*\*\* If yes, City shall pay statutory interest on the "Total Purchase Price" from \_\_\_\_\_ to the close of escrow/date of recording directly to Grantor by separate warrant.
- Special Instructions/Information:** City of Flagstaff to Exchange 1,371 sq/ft. Property valued at \$13,710.00 or \$10.00 sq/ft.

\*Title policy fees based on this amount only.  
 \*\*Sum of "Total Closing Costs" and "Total Purchase Price" only.

THE GRANTOR, having executed a conveyance of hereof and all property rights to the GRANTEE in a certain conveyance dated \_\_\_\_\_ described in Exhibit "A" attached hereto and made a part hereof, and having delivered same to the above Title Company as Escrow Agent, said agent is directed to deliver said conveyance to the CITY OF FLAGSTAFF; title to said property to pass upon the acceptance of delivery and possession by the CITY OF FLAGSTAFF.

**GRANTOR SUBSURFACE IMPROVEMENT TOWNMENT**

- 1. I  am  am not aware of the presence of any subsurface improvements (e.g., septic systems, storm cellars, ground wells) within the area of acquisition. If aware of such improvements, please provide any information that may assist in locating same.
- 2. Well(s)  Yes  No Well Registration No(s): 55-
- 3. Irrigation Water Rights  Yes  No IGR Number: 58-
- 4. Well is located  within the acquisition area,  outside the acquisition area.
- 5.

**(NOTE: If you answered yes regarding water rights, please provide a copy of the appropriate certificate for escrow to transfer, if available)**

The Escrow Agent is to process and record the transfer of the well or irrigation water rights located within the acquisition area to the County.

Yes  No Addendum attached hereto and made part hereof.

Notice of Pending Sale pursuant to A.R.S 33-1806.

**GRANTOR: Gary G. Hundelt and Mary Eileen Hundelt, husband and wife, as joint tenants with right of survivorship**

*Gary G. Hundelt*  
Signature

Gary G. Hundelt 4-13-2024  
Print Date

*Mary Eileen Hundelt*  
Signature

Mary Eileen Hundelt \_\_\_\_\_  
Print Date

Accepted \_\_\_\_\_ Date \_\_\_\_\_  
ESCROW OFFICER

**Grantee: City of Flagstaff, an Arizona municipal corporation**

\_\_\_\_\_  
Greg Clifton, City Manager, City of Flagstaff

# EXHIBIT "A"

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## LEGAL DESCRIPTION:

A portion of that parcel of land recorded in Instrument No. 3805360, Records of Coconino County (R1), being a portion of Lots 5 and 6, Block 25 of Brannen Addition to the Town of Flagstaff, as recorded in Book 1, Page 12 and revised in Book 1 of Maps, Page 42, R.C.C., situated in Section 22, Township 21 North, Range 7 East, Gila and Salt River Meridian, City of Flagstaff, Coconino County, Arizona, said portion being more particularly described as follows:

BEGINNING at the Southwest corner of said parcel of land (R1), said point being a found 1/2" rebar, thence N 01° 02' 59" W [Basis of Bearings: Grid per State Plane Zone Arizona Central (0202)], along the west line of said parcel (R1), for a distance of 1.23 feet to a point;

thence N 88° 18' 31" E for a distance of 4.07 feet to a point of curvature;

thence northeasterly along a curve to the left, having a central angle of 14° 06' 43" and a radius of 68.42 feet, for a distance of 16.85 feet, the chord of said curve bears N 81° 15' 10" E for 16.81 feet to a point of tangency;

thence N 74° 11' 48" E for a distance of 12.26 feet to a point of curvature;

thence northeasterly along a curve to the left, having a central angle of 28° 40' 12" and a radius of 40.00 feet, for a distance of 20.02 feet, the chord of said curve bears N 59° 51' 42" E for 19.81 feet to a point, said point being on the east line of said parcel of land (R1);

thence S 01° 02' 59" E, along the said east line, for a distance of 16.31 feet to a point, said point being on the South line of said parcel of land (R1), also being the said north Right-of-way line of Butler Avenue;

thence S 88° 58' 52" W, along the said north Right-of-way line of Butler Avenue, for a distance of 46.13 feet to the TRUE POINT OF BEGINNING;

said parcel of land contains 282 square feet of land, more or less, including any easements of record over the above described parcel, as shown on Exhibit "A-1", which is made a part hereof by this reference.

NES #21-112\_FEE\_104-01-024



## Addendum to the Purchase Agreement

Between

City of Flagstaff

And

**Gary G. Hundelt and Mary Eileen Hundelt, husband and wife,  
as joint tenants with right of survivorship**

1. Gary G. Hundelt and Mary Eileen Hundelt shall convey to the City of Flagstaff 282 square feet of land in fee simple by Warranty Deed (Exhibit 1), valued at \$11,421.00.
2. In exchange, the City of Flagstaff shall convey to Gary G. Hundelt and Mary Eileen Hundelt 1,183 square feet of land in fee simple by Special Warranty Deed (Exhibit 2), valued at \$11,830.00.

Fee	104-01-024	Exhibit 1	282 sq/ft @ 40.50 sq/ft	\$11,421.00
Fee	104-01-023	Exhibit 2	1,183 sq/ft @ \$10.00 sq/ft	<u>- \$ 11,830.00</u>
<b>Total to be paid by Hundelts to the City of Flagstaff</b>				<b>\$ 409.00</b>

3. The escrow agent shall deposit all escrowed funds in an escrow account and disburse same by check; pay encumbrances in accordance with this agreement; prorate all agreed items; record such escrowed instruments as are necessary or proper in the issuance of title insurance; and pay the balance of the escrowed funds to the party or parties entitled thereto.
4. The City will pay all typical escrow service fees and or title insurance.
5. Due to the loss of access off Butler Road, the City will be providing access and a driveway on the east side of the property off of Lone Tree Road (Colorado Road).
6. All utilities adjacent to the property will be relocated as part of the project at no cost to the Seller.
7. The existing address, 422 E. Butler is not being changed as part of the project.
8. The assemblage of the remnant parcel to the west parcel, if needed, will be supported by the City of Flagstaff. If the owner decides to combine the two parcels, one legal description combining the two parcels will be required by Coconino County. A legal description for the total parcel will be provided by the City to the Seller, at no cost to the property owner. The legal description and exhibit will be prepared by a Registered Land Surveyor (RLS).
9. All parties have the authority to enter into this Agreement and have the authority and power to enter into this Agreement to consummate this transaction.
10. This entire Agreement, together with any attachments, shall supersede any and all other prior understandings and agreements, either written or oral.

Attachments: Exhibit 1 and 2

Signature Page follows

# EXHIBIT 1

When recorded, return to:  
City Clerk  
211 W. Aspen Avenue  
Flagstaff, AZ 86001

Exempt under:  
A.R.S. § 11-1134(A)(3)

## **WARRANTY DEED**

**Gary G. Hundelt and Mary Eileen Hundelt, husband and wife, as joint tenants with right of survivorship**, the Grantor, does hereby grant, convey, and warrant to the **City of Flagstaff, an Arizona municipal corporation**, the Grantee, that certain real property situated in Coconino County, Arizona, together with all rights and privileges appurtenant thereto, to wit:

**SEE EXHIBIT "A" ATTACHED HERETO**

**AND BY REFERENCE MADE A PART HEREOF.**

SUBJECT TO current taxes and assessments, reservations, and all easements, rights-of-way, covenants, conditions, restrictions, liens, and encumbrances of record.

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**PROJECT:** Lone Tree Overpass      **LOCATION:** Butler Avenue – Historic Route 66      **PARCEL:** LT-09

---

Project Number: 03-19004



# EXHIBIT "A"

A portion of that parcel of land recorded in Inst. No. 3805360, Records of Coconino County, being a portion of Lots 5 and 6, Block 25 of Brannen Addition to the Town of Flagstaff, as recorded in Book 1, Page 12 and revised in Book 1, Page 42, R.C.C., situated in Section 22, Township 21 North, Range 7 East, Gila and Salt River Meridian, City of Flagstaff, Coconino County, Arizona

## LEGAL DESCRIPTION:

A portion of that parcel of land recorded in Instrument No. 3805360, Records of Coconino County (R1), being a portion of Lots 5 and 6, Block 25 of Brannen Addition to the Town of Flagstaff, as recorded in Book 1, Page 12 and revised in Book 1 of Maps, Page 42, R.C.C., situated in Section 22, Township 21 North, Range 7 East, Gila and Salt River Meridian, City of Flagstaff, Coconino County, Arizona, said portion being more particularly described as follows:

BEGINNING at the Southwest corner of said parcel of land (R1), said point being a found 1/2" rebar, thence N 01° 02' 59" W [Basis of Bearings: Grid per State Plane Zone Arizona Central (0202)], along the west line of said parcel (R1), for a distance of 1.23 feet to a point;

thence N 88° 18' 31" E for a distance of 4.07 feet to a point of curvature;

thence northeasterly along a curve to the left, having a central angle of 14° 06' 43" and a radius of 68.42 feet, for a distance of 16.85 feet, the chord of said curve bears N 81° 15' 10" E for 16.81 feet to a point of tangency;

thence N 74° 11' 48" E for a distance of 12.26 feet to a point of curvature;

thence northeasterly along a curve to the left, having a central angle of 28° 40' 12" and a radius of 40.00 feet, for a distance of 20.02 feet, the chord of said curve bears N 59° 51' 42" E for 19.81 feet to a point, said point being on the east line of said parcel of land (R1);

thence S 01° 02' 59" E, along the said east line, for a distance of 16.31 feet to a point, said point being on the South line of said parcel of land (R1), also being the said north Right-of-way line of Butler Avenue;

thence S 88° 58' 52" W, along the said north Right-of-way line of Butler Avenue, for a distance of 46.13 feet to the TRUE POINT OF BEGINNING;

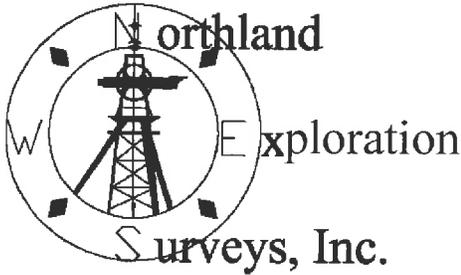
said parcel of land contains 282 square feet of land, more or less, including any easements of record over the above described parcel, as shown on Exhibit "A-1", which is made a part hereof by this reference.

NES #21-112\_FEE\_104-01-024



# EXHIBIT 2





# EXHIBIT "A"

A portion of that parcel of land recorded in Inst. No. 3900247, Records of Coconino County (R1), being a portion of Block 25 of the Revised plat of Brannen Addition as recorded in Book 1, Page 42, Records of Coconino County, situated in Section 22, Township 21 North, Range 7 East, Gila and Salt River Meridian, Coconino County, Arizona

## LEGAL DESCRIPTION:

A portion of that parcel of land recorded in Inst. No. 3900247, Records of Coconino County (R1), being a portion of Block 25 of the Revised plat of Brannen Addition as recorded in Book 1, Page 25, Records of Coconino County, situated in Section 22, Township 21 North, Range 7 East, Gila and Salt River Meridian, Coconino County, Arizona, said portion being more particularly described as follows:

FROM the northeast corner of that parcel of land recorded in Inst. No. 3707289, R.C.C. (R2), said point being a found 12 rebar, thence S 01° 02' 18" E [Basis of Bearings: Grid per State Plane Zone Arizona Central (0202)], along the east line of said Block 25 Brannen Addition, for a distance of 139.04 feet to the northeast corner of said parcel recorded in Inst. No. 3900247 (R1);

thence S 88° 58' 39" W, along the north he of said parcel (R1), for a distance of 15.47 feet to a non-tangent point of curvature, said point being the TRUE POINT OF BEGINNING;

thence southwesterly along a curve to the left, having a central angle of 0° 16' 08ft and a radius of 573.00 feet, for a distance of 2.69 feet, the chord of said curve bears S 06° 01' 29" W a distance of 2.69 feet to a point of tangency;

thence S 05° 53' 25" W for a distance of 59.83 feet to a point of curvature;

thence southwesterly along a curve to the right, having a central angle of 39° 38' 11" and a radius of 40.00 feet, for a distance of 27.67 feet, the chord of said curve bears S 25° 42' 31" W a distance of 27.12 feet to a non-tangent point, said point being on the west line of said parcel (R1);

thence N 01° 02' 59" W, along the said west line (R1), for a distance of 86.29 feet to a point, said point being the northwest corner of said parcel (R1);

thence N 88° 58' 39" E, along the said north line of parcel (R1), for a distance of 19.77 feet to the TRUE POINT OF BEGINNING,

said parcel of land contains 1,183 square feet of land, more or less, including any easements of record over the above described parcel, as shown on Exhibit A-1", which is made a part hereof by this reference.



# EXHIBIT "A 1"

CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	2.69'	573.00'	0°16'08"	S 06°01'29" W	2.69'
C2	27.67'	40.00'	39°38'11"	N 25°42'31" E	27.12'

Aporion of Section 22, Township 21 North, Range 7

CURVE DATA: N 88°56'125" E 150.15' East, Gila and Salt River eridian, Qoconino County,

Fd teel Post  
at r. bcation

LINE TABLE:

LINE	BEARING	DISTANCE
L1	S 88°58'39" W	15.47'
L2	S 05°53'25" W	59.83'
L3	N 01°02'59" W	86.29'
L4	N 88°58'39" E	19.77'

104-01-032A

104-01-030C

104-01-030D

Fd PC I 544



BLOCK 25  
BRANNEN ADDN.

104-01-0228  
SV Dirtworks LLC  
Inst. No. 3707289

S 88°58'39" W  
49.90'

104-01-024  
G.G. & M.E. Hundelt

TPOB

Containing 1,183 sq. ft.

NES#21-1

104-01-023

Crew: NES

Date: 01-10-2024

104-01-023  
City of Flagstaff  
Inst. No. 3900247

Fd 1/2" rbr

Fd AC 55403

Fd 1/2" rbr

140.12' Fd AC 14671 S 88°58'52" W 65.01'

BUTLER AVENUE



Scale: 1" = 40' Date: 0111012024 Job No. 21-112

528 W. Aspen Avenue, Flagstaff, Arizona 86001 (928) 774-5058

NORTHLAND EXPLORATION SURVEYS, INC.

**Purchase Agreement & Addendum to Purchase Agreement (related to Property Exchange for the Lone Tree Overpass Project)**

**Signature Page**

**Gary G. Hundelt and Mary Eileen Hundelt, husband and wife, as joint tenants with right of survivor ship**

\_\_\_\_\_  
Gary G. Hundelt

\_\_\_\_\_  
Mary Eileen Hundelt

**City of Flagstaff**

\_\_\_\_\_  
Greg Clifton, City Manager

Attest :

\_\_\_\_\_  
Stacy Saltzburg, City Clerk

Approved as to form:

\_\_\_\_\_  
City Attorney

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Edward Schenk, Water Services Manager - Stormwater  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



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**TITLE:**

**Consideration and Adoption of Resolution No. 2024-32 and Ordinance No. 2024-20:** A resolution of the Flagstaff City Council declaring as a public record that certain document filed with the City Clerk and entitled "2024 Revisions to Floodplain Regulations" and an ordinance of the City Council of the City of Flagstaff, amending the Flagstaff City Code, Title 12 Floodplains, Chapter 12-01 Flood Plain Regulations, by adopting by reference that certain document entitled "2024 Revisions to Floodplain Regulations"; providing for penalties, repeal of conflicting ordinances, severability, and establishing an effective date

**STAFF RECOMMENDED ACTION:**

1. Adopt Resolution No. 2024-32
2. Read Ordinance No. 2024-20 by title only for the final time
3. City Clerk reads Ordinance No. 2024-20 by title only for the final time
4. Adopt Ordinance No. 2024-20

**Executive Summary:**

Chapter 12-01 of City Code is titled "Flood Plain Regulations" and provides a comprehensive list of development regulations for FEMA special flood hazard areas (SFHAs). This chapter is required by FEMA for all communities but is up to the community to write and maintain. The current revision of Chapter 12-01 is from 2011 and includes terms and definitions that are outdated. The purpose of this revision is to bring the City of Flagstaff's code up to compliance with the current definitions that FEMA uses in 2024. This revision has no policy implications, no changes in regulations, and no fiscal impact. This update is required by FEMA as part of our Community Rating Service (CRS) rating of 5, which provides a 25% discount to federally-backed flood insurance policies.

**Financial Impact:**

There is no financial impact of this revision.

**Policy Impact:**

There is no policy impact of this revision, the revision will update terms and definitions to current FEMA standards.

**Previous Council Decision or Community Discussion:**

None

**Options and Alternatives to Recommended Action:**

The alternative is to not move forward with this minor revisions, due to current CRS standards this will disqualify the City of Flagstaff as a Class 5 community under FEMA forfeiting our 25% National Flood Insurance Policy discount.

**Background and History:**

The Flagstaff community is currently a Class 5 CRS community, providing a 25% discount on National Flood Insurance Policy claims. The City receives this designation through an annual routine audit, and a five-year extensive audit, of flood risk mitigations, actions, and regulations. Chapter 12-01 of City Code provides the majority of the FEMA special flood hazard area (SFHA) regulations for new and existing development in FEMA recognized floodplains and floodways. In the 2019 audit of the City's CRS program there was a recommendation to update Chapter 12-01 to be consistent with current terms and definitions of FEMA. This recommendation became a requirement to remain a Class 5 community in 2021 when the FEMA CRS Handbook was updated. This new requirement was communicated to Stormwater staff in January of this year by our State FEMA regulatory representative (Arizona Department of Water Resources). Stormwater staff consulted with Legal in February and March of this year and are bringing the minor changes required to Council to update Chapter 12-01 to be consistent with FEMA.

**Connection to PBB Priorities and Objectives:**

Priority Based Budget Key Community Priorities and Objectives

Safe & Healthy Community: Ensure the built environment is safe through the use of consistent standards, rules & regulations, & land use practices

**Connection to Regional Plan:**

Regional Plan

Goal WR.5: Manage watersheds and stormwater to address flooding concerns, water quality, environmental protections, and rainwater harvesting.

Goal T.21: Improve transportation safety and efficiency for all modes.

**Connection to Carbon Neutrality Plan:**

This minor revision has no substantial nexus with the Carbon Neutrality Plan

**Connection to 10-Year Housing Plan:**

This minor revision has no substantial nexus with the 10-Year Housing Plan

**Connection to Division Specific Plan:**

This supports both the 2025 Water Services Division Plan and the 2028 Stormwater Section Plan

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**Attachments:**    Res. 2024-32  
                          2024 Revisions to Floodplain Regulations  
                          Ord. 2024-20

**RESOLUTION NO. 2024-32**

**A RESOLUTION OF THE FLAGSTAFF CITY COUNCIL DECLARING AS A PUBLIC RECORD THAT CERTAIN DOCUMENT FILED WITH THE CITY CLERK AND ENTITLED “2024 REVISIONS TO FLOODPLAIN REGULATIONS”**

**RECITALS:**

WHEREAS, pursuant to A.R.S. § 9-802 a municipality may enact or amend provisions of the City Code by reference to a public record, provided that the adopting ordinance is published in full;

WHEREAS, the City of Flagstaff wishes to incorporate by reference amendments to the Flagstaff City Code, Ordinance No. 2024-20, by first declaring said amendments to be a public record.

**ENACTMENTS:**

**NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF FLAGSTAFF AS FOLLOWS:**

SECTION 1. In General.

That certain document known as “*2024 Revisions to Floodplain Regulations*” attached hereto as Exhibit A is hereby declared to be a public record, and one (1) paper copy and one (1) electronic copy maintained in compliance with A.R.S. § 44-7041 shall remain on file with the City Clerk and kept available for public use and inspection.

PASSED AND ADOPTED by the City Council of the City of Flagstaff this 2nd day of July, 2024.

\_\_\_\_\_  
MAYOR

ATTEST:

\_\_\_\_\_  
CITY CLERK

APPROVED AS TO FORM:

\_\_\_\_\_  
CITY ATTORNEY

Exhibits:  
2024 Revisions to Floodplain Regulations

## 2024 REVISIONS TO FLOODPLAIN REGULATIONS

### 12-01-001-0001 STATEMENT OF PURPOSE

It is the purpose of these regulations to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in the City of Flagstaff by provisions designed:

- A. To protect human life and health;
- B. To minimize flood damages and reduce the height and velocities which are caused by obstructions which restrict the capacity of the watercourses and floodways;
- C. To reduce the financial burden imposed on the community, its governmental units and its citizens;
- D. To assure retention of sufficient floodway area to convey the base flood;
- E. To enhance wildlife and recreation values where appropriate by preserving riparian vegetation along watercourses and floodplains;
- F. To minimize expenditure of public money for costly flood control projects;
- G. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- H. To minimize prolonged business interruptions;
- I. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in SPECIAL FLOOD HAZARD AREAS;
- J. To help maintain a stable tax base by providing for the ~~second~~ SOUND use and development of SPECIAL FLOOD HAZARD AREAS so as to minimize future flood blight areas;
- K. To ~~insure~~ PROVIDE A FRAMEWORK that potential buyers are notified EDUCATED that property is in an area of Special FLOOD HAZARD AREA;
- L. To insure that those who occupy Special FLOOD HAZARD AREA assume responsibility for their actions; and
- M. To maintain eligibility for the National Flood Insurance Program and State and/or Federal Disaster Relief.

### 12-01-001-0001.01 STATUTORY AUTHORIZATION

~~A.R.S. § 48-3610, the Arizona State Legislature authorizes City of Flagstaff to adopt regulations in conformance with A.R.S. § 48-3603 designed to promote the public health, safety and general welfare of its citizenry.~~

IN A.R.S. § 48-3610, THE ARIZONA STATE LEGISLATURE ENABLED THE CITY TO ASSUME

THE POWERS AND DUTIES FOR FLOODPLAIN MANAGEMENT AND ADOPT REGULATIONS IN CONFORMANCE WITH A.R.S. § 48-3609 DESIGNED TO PROMOTE THE PUBLIC HEALTH, SAFETY, AND GENERAL WELFARE OF ITS CITIZENRY. THEREFORE, THE CITY COUNCIL OF FLAGSTAFF, ARIZONA, DOES ORDAIN AS FOLLOWS:

**12-01-001-0001.2 FINDINGS OF FACT**

A. The SPECIAL FLOOD HAZARD AREAS of the City of Flagstaff are subject to periodic inundation which may result in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief and impairment of the tax base, all of which adversely affect the public health, safety and general welfare.

B. These flood losses may be caused by the cumulative effect of obstructions in SPECIAL FLOOD HAZARD AREAS which increase flood heights and velocities and, when inadequately anchored, cause damage in other areas. Uses that are inadequately flood proofed, elevated or otherwise protected from flood damage, also contribute to the flood loss.

**12-01-001-0002 METHODS OF REDUCING FLOOD LOSSES:**

In order to accomplish its purpose, these regulations includes methods and provisions for:

A. Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;

B. Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

C. Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;

D. Controlling filling, grading, dredging, and other development which may increase flood damage; and

E. Preventing or regulating the construction of flood barriers which may unnaturally divert flood waters or which may increase flood hazards in other areas.

F. Controlling or regulating increased stormwater runoff caused by development within contributing watersheds of watercourses and floodplains.

**12-01-001-0003 DEFINITIONS**

Unless specifically defined below, words or phrases used in these regulations shall be interpreted so as to give them the meaning they have in common usage and to give these regulations their most reasonable application.

"Accessory Use" means a use which is incidental and subordinate to the principal use of the parcel of land on which it is applied.

"Accessory Structure" ~~means a structure that is solely for the parking of no more than 2 cars; or~~

~~limited storage (small, low cost sheds 200 sq. ft. or less).~~ FEMA PUBLICATION P-2140: FLOODPLAIN MANAGEMENT REQUIREMENTS FOR AGRICULTURAL STRUCTURES AND ACCESSORY STRUCTURES, DEFINES AN ACCESSORY STRUCTURE AS:

FOR FLOODPLAIN MANAGEMENT PURPOSES, ACCESSORY STRUCTURES ARE STRUCTURES THAT ARE ON THE SAME PARCEL OF PROPERTY AS A PRINCIPAL STRUCTURE, THE USE OF WHICH IS INCIDENTAL TO THE USE OF THE PRINCIPAL STRUCTURE. ACCESSORY STRUCTURES MUST BE USED FOR PARKING OR STORAGE, BE SMALL AND REPRESENT A MINIMAL INVESTMENT BY OWNERS, AND HAVE LOW DAMAGE POTENTIAL. FEMA CONSIDERS "SMALL" TO MEAN NOT LARGER THAN A ONE-STORY TWO-CAR GARAGE. EXAMPLES OF SMALL ACCESSORY STRUCTURES INCLUDE, BUT ARE NOT LIMITED TO, DETACHED GARAGES, STORAGE AND TOOL SHEDS, AND SMALL BOATHOUSES.

- STRUCTURE SIZE - THE FOOTPRINT OF A TYPICAL TWO-CAR GARAGE IS ABOUT 600 SQUARE FEET IN AREA. OR LIMITED STORAGE (SMALL, LOW COST SHEDS 200 SQ. FT. OR LESS).
- STORAGE - CONTENTS STORED IN WET FLOODPROOFED STRUCTURES WILL GET WET DURING FLOODING.

"Addition" means any alteration to an existing structure which results in any extension or increase in the structure's floor area or height.

"Alluvial Fan Flooding" means flooding occurring on the surface of an alluvial fan or similar landform which originates at the apex and is characterized by high velocity flows, active processes of erosion, sediment transport and deposition, and unpredictable flow paths.

"Alteration" means any act or process that changes one or more of the existing features of a structure, including but not limited to, exterior changes or interior modifications of a structure or any of its architectural details or visual characteristics, including paint color, surface texture, and facade materials.

"Apex" means a point on an alluvial fan or similar landform below which the flow path of the major stream that formed the fan becomes unpredictable and alluvial fan flooding can occur.

"Appeal" means a request for a review of the Floodplain Administrator's interpretation of any provision of these regulations.

"Architect" means a Registered Professional Architect in the State of Arizona.

"Area of Jurisdiction" means the lands within the municipal boundaries of the City of Flagstaff.

"Area of Shallow Flooding" means a designated AO or AH Zone on the Flood Insurance Rate Map, (FIRM) with a one percent or greater annual chance of flooding. The base flood depths range from one to three feet; a clearly defined channel does not exist; the path of flooding is unpredictable and indeterminate; and velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

~~"Area of Special Flood Hazard" means the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. This area is designated as Zone A, AO, AH, AE, or A99 on the FIRM and other areas determined by the criteria adopted by the~~

~~Director of the Arizona Department of Water Resources. For the purposes of these regulations, the term "Special Flood Hazard Area" (SFHA) is synonymous in meaning with "area of special flood hazard".~~

"Base Flood" means the flood having a one percent chance of being equaled or exceeded in any given year. For the purposes of these regulations, the term "base flood" is synonymous in meaning with the "100-year flood".

~~"Base Flood Elevation (BFE)" means the elevation shown on the Flood Insurance Rate Map for Zones AH, V and VE that indicate the water surface elevation resulting from a flood that has a 1-percent or greater chance of being equaled or exceeded in any given year.~~

"Base Flood Elevation (BFE)" The computed elevation to which floodwater is anticipated to rise during the base flood.

"Breakaway Wall" means a wall that is not part of the structural support of a building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building supporting foundation system.

"Building" see "Structure".

~~"Chief Executive Officer of the Community (CEO)" means the official of the community who is charged with the authority to implement and administer laws, ordinances, and regulations for that community.~~

"Community" means any state or area or political subdivision thereof, or any Indian tribe or authorized tribal organization, ~~or Alaska Native village~~ or authorized native organization, which has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction.

"Critical Facilities" means structures or facilities that produce, use or store highly volatile, flammable, explosive, toxic, and/or water reactive materials; hospitals; nursing homes and housing likely to contain occupants who may not be sufficiently mobile to avoid death or injury during a flood; police stations; fire stations; vehicle and equipment storage facilities and emergency operations centers that are needed for flood response activities before, during, and after a flood; and public and private utility facilities that are vital to maintaining or restoring normal services to flooded areas before, during, and after a flood.

"Critical Feature" means an integral and readily identifiable part of a flood protection system without which the flood protection provided by the entire system would be compromised.

"Development" means any man-made change to improved or unimproved real estate, including but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavating or drilling operations or storage of materials or equipment.

"Discontinued Use" means the relinquishment of a property or the cessation of a use or activity by the owner or tenant, excluding temporary or short term interruptions for the purpose of remodeling, maintaining or otherwise improving or rearranging the facility. A use shall be deemed as discontinued when such use is suspended as evidenced by the cessation of activities or conditions that constitute the principal use of the property.

~~"Elevation Certificate" — means the most current version of the Elevation Certificate form developed by the Federal Emergency Management Agency (FEMA Form 81-31) AN ADMINISTRATIVE TOOL OF THE NATIONAL FLOOD INSURANCE PROGRAM (NFIP) THAT IS USED TO PROVIDE ELEVATION INFORMATION NECESSARY TO ENSURE COMPLIANCE WITH COMMUNITY FLOODPLAIN MANAGEMENT ORDINANCE, TO DETERMINE THE PROPER INSURANCE PREMIUM RATE, AND TO SUPPORT A REQUEST FOR A LETTER OF MAP AMENDMENT (LOMA) OR LETTER OF MAP REVISION BASED ON FILL (LOMR-F).~~

"Encroachment" means the advance or infringement of any uses, including but not limited to, ANTHROPOLOGICAL plant growth (INTENTIONAL PLANTINGS), fill, excavation, buildings, permanent structures, fencing, or other development into a floodplain which may impede and/or alter the flow or storage capacity of a floodplain, or cause an increase in the floodway elevation.

"Engineer" means a Professional Engineer registered in the State of Arizona.

Engineering Geologist means a Professional Engineering Geologist registered in the State of Arizona.

"Erosion", OR "EROSION HAZARD", means the process of the gradual wearing away of land masses. This peril is not, per se, covered under the NATIONAL FLOOD INSURANCE PROGRAM (NFIP) (see "flood-related erosion").

~~"Erosion Hazard" means the process of the wearing away of land masses. This peril is not per se covered under the NFIP (see "flood-related erosion").~~

"Exceptional Hardship" means a hardship that would result from failure to grant a variance which is exceptional, unusual, and peculiar to the property involved. Mere economic or financial hardship alone is not exceptional.

Inconvenience, aesthetic considerations, physical handicaps, personal preferences, or the disapproval of one's neighbors likewise cannot, as a rule, qualify as an exceptional hardship. All of these problems can be resolved through other means without granting a variance, even if the alternative is more expensive, or requires the property owner to build elsewhere or put the parcel to a different use than originally intended.

"FEMA" means the Federal Emergency Management Agency

"Flood or Flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from:

- A. The overflow of inland or tidal waters;
- B. The unusual and rapid accumulation or runoff of surface waters from any source, and/or
- C. The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in this definition.

~~"Flood Boundary and Floodway Map (FBFM)" means the official map on which the Federal Emergency Management Agency (FEMA) has delineated both the Special Flood Hazard Areas and the regulatory floodway.~~

"Flood Elevation Determination" means a determination, by the Administrator, of the water surface elevations of the base flood, that is, the flood level that has a one percent or greater chance of occurrence in any given year.

~~"Flood Elevation Study" means an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudslide (i.e., mudflow) and/or flood-related erosion hazards.~~

"Flood Fringe" means that area located between the regulatory floodway and the boundary of the 100-year floodplain as shown on the FLOOD INSURANCE STUDY. ~~Flood Boundary and Floodway Map~~

"Flood Insurance Rate Map (FIRM)" means the official map of the community, on which the Federal Insurance Administrator FEMA has delineated both the SPECIAL FLOOD HAZARD AREAS and the risk premium zones applicable to the community.

"Flood Insurance Study (FIS)" means the official report provided by the Federal Emergency Management Agency (FEMA) that includes flood profiles, ~~the Flood Insurance Rate Map~~, the Flood Boundary and Floodway Map, and the water surface elevations of the base flood.

"Flood Protection System" means those physical structural works for which funds have been authorized, appropriated, and expended and which have been constructed specifically to modify flooding in order to reduce the extent of the area within a community subject to a "special flood hazard" and the extent of the depths of associated flooding. Such a system typically includes channels, dams, reservoirs, levees, or dikes. These specialized flood modifying works are those constructed in conformance with sound engineering standards.

"Floodproofing" means any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to improved or unimproved real property, water and sanitary facilities, structures and their contents BY MEANS OTHER THAN ELEVATION.

"Floodproofing Certificate" – means the most current version of the Floodproofing Certificate form developed by the Federal Emergency Management Agency ~~(FEMA Form 81-65)~~.

"Flood-Related Erosion" means the collapse or subsidence of land along the shore of a lake or other body of water as a result of undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as a flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding.

"Floodplain or Flood-Prone Area" means any land area susceptible to being inundated by water from any source (see definition of "flood or flooding"). "Floodplain" areas include the "flood fringe" and the "regulatory floodway".

"Floodplain Administrator" is the individual or his/her authorized representative authorized by the

Floodplain Board to administer, implement, and enforce the provisions of these regulations. MOST OFTEN THE STORMWATER SECTION DIRECTOR OR THE STORMWATER PROJECT MANAGER FOR THE FLOODPLAIN MANAGEMENT PROGRAM.

"Floodplain Board" is the City Council of the City of Flagstaff at such times as they are engaged in the administration, implementation, and enforcement of these regulations.

"Floodplain Management" means the operation of an overall program of corrective and preventive measures for reducing flood damage and preserving and enhancing where possible natural resources in the floodplain. Including, but not limited to, emergency preparedness plans, flood control works, floodplain management regulations and open space plans.

"Floodplain Management Regulations" means the zoning ordinances, subdivision regulations, building codes, health regulations, state statutes, special purpose ordinances (such as a floodplain management ordinance, grading ordinance, stormwater management ordinance, and erosion control ordinance) and other relevant applications of police power. The term describes such Federal, state, or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.

"Floodplain Use Permit" means a permit issued by the Floodplain Administrator under the provisions of these regulations for development of land located in a floodplain.

"Flood-Related Erosion Area Management" means the operation of an overall program of corrective and preventive measures for reducing flood-related erosion damage, including, but not limited to, emergency preparedness plans, flood-related erosion control works, and floodplain management regulations.

"Floodway" - see "Regulatory Floodway".

"Freeboard" means a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed.

"Functionally Dependent Use" means a use which cannot be performed unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, but does not include long-term storage or related manufacturing facilities.

"Highest Adjacent Grade (HAG)" means the highest natural elevation, prior to fill or excavation, of the ground surface prior to construction next to the proposed walls of a structure.

"Historic Structure" means any structure that is:

- A. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- B. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by

the Secretary to qualify as a registered historic district;

C. Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or

D. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:

1. By an approved state program as determined by the Secretary of the Interior; or
2. Directly by the Secretary of the Interior in states without approved programs.

"Lateral Addition" An addition to an existing structure that is beside and connected to the existing structure. If one building is connected to another through a covered breezeway or similar connection it is considered to be a separate building, and not an addition, for the purpose of this Ordinance.

"Levee" means a man-made structure; usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

"Levee System" means a flood protection system which consists of a levee, or levees, and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices.

"Lowest Floor" means the lowest floor of the lowest enclosed area (including basement) of a building. An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access, or storage in an area other than a basement area is not considered a building's lowest floor, provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of this CITY Ordinance. The lowest floor elevation is defined as the bottom of the lowest floor joist, horizontal structural member, or duct work.

"Manufactured Home" means a structure, transportable in one (1) or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities.

For the purposes of floodplain management, the term "manufactured home" also includes park trailers, travel trailers and other similar vehicles placed on a site for greater than 180 consecutive days or which are not licensed and ready for highway use. The term "manufactured home" does not include a "recreational vehicle".

"Manufactured Home Park or Subdivision" means a parcel (or contiguous parcels) of land divided into two (2) or more manufactured home lots for sale or rent.

"Map" means the ~~Flood Hazard Boundary Map (FHBM) or the Flood Insurance Rate Map (FIRM)~~ for the community as issued by FEMA.

"Market Value" shall be determined by the current Coconino County Assessor's Office assessed value or by an independent professional appraiser by estimating the cost to replace the structure in new condition and adjusting that cost figure by the amount of depreciation which has accrued since the structure was constructed. The cost of replacement of the structure shall be based on a square foot cost factor determined by reference to a building cost estimating guide recognized

by the building construction industry. The amount of depreciation shall be determined by taking into account the age and physical deterioration of the structure and functional obsolescence as approved by the Floodplain Administrator, but shall not include economic or other forms of external obsolescence. Use of replacement costs or accrued depreciation factors different from those contained in recognized building cost estimating guides may be considered only if such factors are included in a report prepared by an independent professional appraiser and supported by a written explanation of the differences.

"Mean Sea Level" means, for purposes of the National Flood Insurance Program, the National Geodetic Vertical Datum, (NGVD) of 1929, North American Vertical Datum (NAVD) of 1988, or other datum, to which **BASE FLOOD ELEVATIONS** shown on a community's Flood Insurance Rate Map are referenced.

"Mudslide (i.e., Mudflow)" describes a condition where there is a river, flow or inundation of liquid mud down a hillside usually as a result of a dual condition of loss of brush cover, and the subsequent accumulation of water on the ground preceded by a period of unusually heavy or sustained rain. A mudslide (i.e., mudflow) may occur as a distinct phenomenon while a landslide is in progress, and will be recognized as such by the Administrator only if the mudflow, and not the landslide, is the proximate cause of damage that occurs.

"Mudslide (i.e., Mudflow) Area Management" means the operation of an overall program of corrective and preventive measures for reducing mudslide (i.e., mudflow) damage, including, but not limited to, emergency preparedness plans, mudslide control works, and floodplain management regulations.

"Mudslide (i.e. Mudflow), Prone Area" means an area with land surfaces and slopes of unconsolidated material where the history, geology, and climate indicate a potential for mudflow.

"New Construction" means, for the purposes of determining insurance rates, structures for which the "start of construction" commenced on or after the effective date of an initial FIRM or after December 31, 1974, whichever is later, and includes any subsequent improvements to such structures. For floodplain management purposes, "new construction" means structures for which the "start of construction" commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.

"New Manufactured Home Park or Subdivision" means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed, including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads, and which is completed on or after the effective date of these floodplain regulations.

"Nonconforming Use" means a structure or the use of a structure or premises, which was lawful but not in conformity with these regulations before the adoption or amendment of these floodplain regulations.

"Nonresidential Structure" means any structure or any portion of a structure used exclusively for, or designed as and capable of being used for, without limitation, office, commercial, business, educational, public, industrial, factory, or governmental occupation.

"Obstruction" includes, but is not limited to, any dam, wall, wharf, embankment, levee, dike, pile,

abutment, protection, excavation, channelization, bridges, conduit, culvert, building, wire, fence, rock, gravel, fill, dumping, structure, vegetation, or other material in, along, across, or projecting into a watercourse which may alter, impede, retard or change the direction and/or velocity of the flow of water, or due to its location, its propensity to snare or collect debris carried by the flow of water, or its likelihood of being carried downstream.

"One Hundred-Year Flood" means the flood having a one percent chance of being equaled or exceeded in any given year (see "Base Flood").

"Person" includes an individual or his agent, firm, partnership, association, limited liability company, or corporation, or agent of the aforementioned groups, or this State or its agencies or political subdivisions.

"Program Deficiency" means a defect in a community's floodplain management regulations or administrative procedures that impairs effective implementation of those floodplain management regulations or of the National Flood Insurance Program standards.

"Reconstruction" means the rebuilding of an existing structure which has been partially or completely destroyed by any cause (e.g., fire, wind, flood) without increasing the floor area of the structure.

"Recreational Vehicle" means a vehicle which is:

- A. Built on a single chassis;
- B. 400 square feet or less when measured at the largest horizontal projection;
- C. Designed to be self-propelled or permanently towable by a light duty truck; and
- D. Designed primarily not for use as a permanent dwelling but as a temporary living quarters for recreational, camping, travel, or seasonal use.

"Regulatory Flood Elevation (RFE)" means an elevation one foot above the BASE FLOOD ELEVATION for a watercourse for which the BASE FLOOD ELEVATION has been determined and shall be as determined by the criteria developed by the Director of the Arizona Department of Water Resources for all other watercourses.

"Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

"Rehabilitation" means any improvements and repairs which are made to the interior or exterior of an existing structure but which do not result in any increase in the floor area of the structure.

"Remedy a Violation" means to bring the structure or other development into compliance with FEDERAL, State, or local floodplain management regulations, or, if this is not possible, to reduce the impacts of its noncompliance. Ways that impacts may be reduced include protecting the structure or other affected development from flood damages, implementing the enforcement provisions of this Ordinance or otherwise deterring future similar violations, or reducing FEDERAL OR STATE financial exposure with regard to the structure or other development.

"Residential Structure" means any structure or any portion of a structure that is used for, or designed as and capable of being used for, the temporary or permanent domicile of persons, including without limitation a dwelling unit, apartment house, boarding house, hotel, motel, nursing home, lodging house, congregate residence, jail, prison, and similarly used structures.

Soils Engineer means a Professional Soils Engineer registered in the State of Arizona.

"Special Flood Hazard Area (SFHA)" means an area in the floodplain subject to a 1 percent or greater chance of flooding in any given year. An area having special flood or flood-related erosion hazards, and shown on an FBFM or **THE** FIRM as Zone A, AO, AE, A99, or AH (see "Area of Special Flood Hazard").

"Start of Construction", includes substantial improvement and other proposed new development, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers or foundations, or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual "start of construction" means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

"Stormwater Management Design Manual" means the most recent edition of the City of Flagstaff Stormwater Management Design Manual.

"Structure" means, for floodplain management purposes, that which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner. This includes, without limitation, a walled and roofed building, including a gas or liquid storage tank that is principally above ground, as well as a manufactured home.

"Substantial Damage" means damage of any origin sustained by a structure whereby the cumulative cost of restoring the structure to its before damaged condition would equal or exceed fifty (50) percent of the market value of the structure before the damage occurred.

"Substantial Improvement" means any repair, reconstruction, rehabilitation, addition or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction" of the improvement. This term includes structures which have incurred "substantial damage", regardless of the actual repair work performed. The term does not, however, include either:

- A. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions;
- or

B. Any alteration of a "historic structure", provided that the alteration will not preclude the structure's continued designation as a "historic structure".

"Surveyor" means a Registered Professional Land Surveyor in the State of Arizona.

"Variance" means a grant of relief from the requirements of this Ordinance which permits construction in a manner that would otherwise be prohibited by these regulations.

"Violation" means the failure of a structure or other development to be fully compliant with the community's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in these regulations is presumed to be in violation until such time as that documentation is provided.

"Water Surface Elevation" means the height, in relation to the National Geodetic Vertical Datum (NGVD) of 1929, North American Vertical Datum (NAVD) of 1988, (or other datum, where specified) of floods of various magnitudes and frequencies in the floodplains of riverine areas.

"Watercourse" means a lake, river, creek, stream, wash, arroyo, channel, or other topographic feature on or over which waters flow at least periodically. "Watercourse" includes specifically designated areas in which substantial flood damage may occur.

~~"Watercourse Master Plan" means a hydraulic and hydrologic plan for a watercourse that examines the cumulative impacts of existing development and future encroachment in the floodplain and future development in the watershed on potential flood damages, and establishes technical criteria for subsequent development so as to minimize potential flood damages for all flood events up to and including the one hundred-year flood.~~

"WATERSHED MASTER PLAN" MEANS A HYDRAULIC AND HYDROLOGIC PLAN FOR A WATERCOURSE THAT EXAMINES THE CUMULATIVE IMPACTS OF EXISTING DEVELOPMENT AND FUTURE ENCROACHMENT IN THE FLOODPLAIN AND FUTURE DEVELOPMENT IN THE WATERSHED ON POTENTIAL FLOOD DAMAGES, AND ESTABLISHES TECHNICAL CRITERIA FOR SUBSEQUENT DEVELOPMENT SO AS TO MINIMIZE POTENTIAL FLOOD DAMAGES FOR ALL FLOOD EVENTS UP TO AND INCLUDING THE ONE HUNDRED-YEAR FLOOD.

## **12-01-001-0004 GENERAL PROVISIONS**

### **12-01-001-0004.01 JURISDICTION**

A. These regulations shall apply to all areas within the corporate limits of the City of Flagstaff, Arizona INCLUDING SPECIAL FLOOD HAZARD AREAS AND ADMINISTRATIVE FLOODPLAINS.

B. The provisions of these regulations shall apply to lands outside the corporate limits of the City of Flagstaff upon annexation of such lands.

### **12-01-001-0004.02 BASIS FOR ESTABLISHING SPECIAL FLOOD HAZARD AREAS**

A. The Federal Emergency Management Agency (FEMA) scientific and engineering report entitled "Flood Insurance Study, dated September 3, 2010, Coconino County, Arizona and Incorporated Areas" with accompanying Flood Insurance Rate Maps (FIRM's), and all

subsequent amendments and/or revisions, identifying SPECIAL FLOOD HAZARD AREAS, are hereby adopted by reference and declared to be a part of this Ordinance. The Flood Insurance Study (FIS) and the FIRM panels are on file in the office of the Floodplain Administrator at ~~City Hall, City of Flagstaff, 211 W. Aspen Ave. Flagstaff, AZ 86001~~ 2323 N WALGREENS DR. FLAGSTAFF, AZ 86004 AND ONLINE AT FLAGSTAFFAZ.GOV/4315/FLOOD-INFORMATION. The FIS and attendant mapping is the minimum area of applicability of these regulations and may be supplemented by studies for other areas which allow implementation of this Ordinance and which are recommended to the Floodplain Board by the Floodplain Administrator. The Floodplain Board, within its area of jurisdiction, shall delineate, or may by rule require developers of land to delineate, for areas where development is ongoing or imminent, and thereafter as development becomes imminent, floodplains consistent with the criteria developed by the Federal Emergency Management Agency and the Director of the Arizona Department of Water Resources.

B. The Floodplain Board may adopt additional floodplain studies or reports by reference and declare them to be part of these regulations, provided that any differences in floodplain delineation between such additional studies or reports and the effective Flood Insurance Rate Map(s) shall be resolved by applying those provisions which result in a broader floodplain delineation. A copy of such studies shall be on file in the office of the Floodplain Administrator.

#### **12-01-001-0004.03 COMPLIANCE**

No structure or development shall hereafter be constructed, located, extended, converted, or altered without full compliance with the provisions of these regulations and other applicable codes.

#### **12-01-001-0004.04 ABROGATION AND GREATER RESTRICTIONS:**

These regulations are not intended to repeal, abrogate or impair any existing easements, covenants, or deed restrictions. However, where these regulations and another Ordinance, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

#### **12-01-001-0004.05 INTERPRETATION:**

In the interpretation and application of these regulations, all provisions shall be:

- A. Considered as minimum requirements;
- B. Liberally construed in favor of the governing body; and
- C. Deemed neither to limit nor repeal any other powers granted under State Statutes.

#### **12-01-001-0004.06 WARNING AND DISCLAIMER OF LIABILITY:**

The degree of flood protection required by these regulations is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This Ordinance does not imply that land outside the SPECIAL FLOOD HAZARD AREAS or uses permitted within such areas will be free from flooding or flood damages. These regulations shall not create liability on the part of the City of Flagstaff, any officer or employee thereof, the State of Arizona, or the Federal Emergency Management Agency, for any flood damages that

result from reliance on these regulations or any administrative decision lawfully made thereunder.

**12-01-001-0004.07 STATUTORY EXEMPTIONS:**

A. In accordance with A.R.S. Section 48-3609(H), unless otherwise expressly provided, this and any regulation adopted pursuant to said statute do not affect:

1. Existing legal uses of property or the right to continuation of such legal use. However, if a nonconforming use of land or a building or structure is discontinued for twelve (12) months or destroyed to the extent of fifty (50) percent of its market value, as determined by an independent professional appraiser, any further use shall comply with ~~these regulations~~ THIS ORDINANCE.

2. Reasonable repair or alteration of property for the purposes for which the property was legally used on August 3, 1984, or on the date any regulations affecting such property takes effect, except that any alteration, addition or repair to a nonconforming building or structure which would result in increasing its flood damage potential by fifty (50) percent or more shall be either flood-proofed or elevated to or above the REGULATORY FLOOD ELEVATION.

3. Reasonable repair of structures constructed with the written authorization required by A.R.S. Section 48-3613.

4. Facilities constructed or installed pursuant to a CERTIFICATE of environmental compatibility issued pursuant to Title 40, Chapter 2, Article 6.2, Arizona revised Statutes (A.R.S. Section 40-360, et seq.). ~~B. BEFORE THE FOLLOWING TYPES OF CONSTRUCTION AUTHORIZED BY A.R.S. § 48-3613(B) BEGIN, THE RESPONSIBLE PERSON MUST SUBMIT PLANS FOR THE CONSTRUCTION TO THE FLOODPLAIN BOARD (THE "BOARD") FOR REVIEW AND COMMENT PURSUANT TO A.R.S. § 48-3613(C). In accordance with A.R.S. Section 48-3613, written authorization shall not be required, nor shall the Floodplain Board (the "Board") prohibit:~~

5. The construction of bridges, culverts, dikes, and other structures necessary for the construction of public highways, roads, and streets intersecting or crossing a watercourse.

6. The construction of storage dams for watering livestock or wildlife and structures on banks of a watercourse to prevent erosion of or damage to adjoining land if the structure will not divert, retard or obstruct the natural channel of the watercourse, or dams for the conservation of floodwaters as permitted by A.R.S. Title 45, Chapter 6.

7. Construction of tailing dams and waste disposal areas for use in connection with mining and metallurgical operations. This paragraph does not exempt those sand and gravel operations which will divert, retard, or obstruct the flow of waters in any watercourse from complying with and acquiring authorization from the Board pursuant to regulations adopted by the Board under said statute.

8. Other construction if it is determined by the Board that written authorization is unnecessary.

9. Any flood control district, county, city, town, or other political subdivision from exercising powers granted to it under A.R.S. Title 48, Chapter 21, Article 1 said statute.

10. The construction of streams, waterways, lakes, and other auxiliary facilities in conjunction with development of public parks and recreation facilities by a public agency or political subdivision.

11. The construction and erection of poles, towers, foundations, support structures, guy wires, and other facilities related to power transmission as constructed by any utility whether a public service corporation or a political subdivision.

~~C. — Before any construction authorized by Subsection B of this Section may begin, the responsible person must submit plans for the construction to the Board for review and comment. These exemptions do not preclude any person from liability if that person's actions increase flood hazards to any other person's property.~~

C. IN ACCORDANCE WITH A.R.S. § 48-3613(D), IN ADDITION TO OTHER PENALTIES OR REMEDIES OTHERWISE PROVIDED BY LAW, THIS STATE, A POLITICAL SUBDIVISION OR A PERSON WHO MAY BE DAMAGED OR HAS BEEN DAMAGED AS A RESULT OF THE UNAUTHORIZED DIVERSION, RETARDATION, OR OBSTRUCTION OF A WATERCOURSE HAS THE RIGHT TO COMMENCE, MAINTAIN, AND PROSECUTE ANY APPROPRIATE ACTION OR PURSUE ANY REMEDY TO ENJOIN, ABATE, OR OTHERWISE PREVENT ANY PERSON FROM VIOLATING OR CONTINUING TO VIOLATE THIS SECTION OR REGULATIONS ADOPTED PURSUANT TO A.R.S. TITLE 48, CHAPTER 21, ARTICLE 1. IF A PERSON IS FOUND TO BE IN VIOLATION OF THIS SECTION, THE COURT SHALL REQUIRE THE VIOLATOR TO EITHER COMPLY WITH THIS SECTION IF AUTHORIZED BY THE FLOODPLAIN BOARD OR REMOVE THE OBSTRUCTION AND RESTORE THE WATERCOURSE TO ITS ORIGINAL STATE. THE COURT MAY ALSO AWARD SUCH MONETARY DAMAGES AS ARE APPROPRIATE TO THE INJURED PARTIES RESULTING FROM THE VIOLATION INCLUDING REASONABLE COSTS AND ATTORNEY FEES.

~~D. — In addition to other penalties or remedies otherwise provided by law, this State, a political subdivision thereof, or a person who may be damaged or has been damaged as a result of the unauthorized diversion, retardation, or obstruction of a watercourse has the right to commence, maintain, and prosecute any appropriate action or pursue any remedy to enjoin, abate, or otherwise prevent any person from violating or continuing to violate this section or regulations adopted pursuant to A.R.S. Section 48-3610. If a person is found to be in violation of this section, the court shall require the violator to either comply with this section if authorized by the Board or remove the obstruction and restore the watercourse to its original state. The court may also award such monetary damages as are appropriate to the injured parties resulting from the violation including reasonable costs and attorney fees.~~

#### **12-01-001-0004.08 NONCONFORMING USES:**

A structure or the use of a structure or premises which existed and was lawful, but not in conformity, before the adoption or amendment of these regulations, may be continued subject to the following conditions:

A. No existing structure in the floodway shall be expanded, but may be modified, altered or repaired to incorporate elevation or flood proofing measures, provided such measures comply with the substantial improvement requirements of this ordinance and do not raise the level of the base flood or floodway.

B. If a nonconforming use of land or a building or structure is discontinued for twelve (12) months or destroyed to the extent of fifty percent of its market value, as determined by a

competent professional appraiser, any further use shall comply with these regulations. Intent to resume active operations shall not affect the foregoing.

C. If any nonconforming building in the floodplain is substantially damaged, it shall not be reconstructed except in conformance with the provisions of these regulations.

D. Additions to nonconforming structures shall be constructed in conformance with the provisions of these regulations.

#### **12-01-001-0004.09 DECLARATION OF PUBLIC NUISANCE:**

~~Every new structure, building, fill, excavation, or development~~ **ALL DEVELOPMENT** located or maintained within any Special Flood Hazard Areas after August 8, 1973, in violation of these regulations, is a public nuisance per se and may be abated, prevented, or restrained by action of the City of Flagstaff.

#### **12-01-001-0004.10 VIOLATIONS AND ABATEMENT**

A. No structure or land within the Special Flood Hazard Area shall be constructed, located, extended, converted or altered without full compliance with the requirements of this Ordinance and other applicable regulations.

B. Upon discovery of a violation of the provisions of these regulations, the Floodplain Administrator shall issue a written Notice of Violation to the person or property owner responsible for such violation. The Notice of Violation shall specify the nature of the violation and order abatement of the violation.

C. If the Floodplain Administrator determines that a violation of this ordinance does not result in a life-safety issue, or does not create an immediate threat to surrounding properties, then the responsible party shall have 30 days following a Notice of Violation in order to remedy the violation, or develop a remediation plan acceptable to the Floodplain Administrator, before any penalties are assessed pursuant to Section 12-01-001-0004.11.

D. It is unlawful for a person to engage in any development or to divert, retard or obstruct the flow of waters in a watercourse if it creates a hazard to life or property without securing the written authorization required by Arizona Revised Statute (ARS) section 48-3613. Where the watercourse is a delineated floodplain it is unlawful to engage in any development affecting the flow of waters without securing written authorization required by section ARS 48- 3613.

E. Stormwater that is generated and concentrated as a result of single, residential lot development is not considered a watercourse and not regulated under this ordinance.

F. The Floodplain Administrator shall reserve the right to submit to the Administrator of the Federal Emergency Management Agency (FEMA) a declaration for denial of insurance, stating that a property is in violation of a specified federal, state or local law, regulation, or ordinance, pursuant to 44 CFR Ch. 1, Part 73 – Implementation of Section 1316 of the National Flood Insurance Act of 1968.

G. Nothing contained herein shall prevent the City of Flagstaff from taking such lawful action as is necessary to prevent or remedy any violation.

## **12-01-001-0004.11 PENALTIES**

Violations of the provisions of these regulations by failure to comply with any of their requirements, including violations of conditions and safeguards established in connection with conditions, shall constitute a misdemeanor. Any person who violates the provisions of these regulations or fails to comply with any of their requirements shall, upon conviction thereof, be guilty of a Class 2 misdemeanor and subject to the associated fines and penalties established by the Arizona Revised Statutes, §§ 48-3615 and 13-802B. In addition, such person shall pay all costs and expenses involved in the case. A separate offense shall be deemed committed for each day such violation continues.

## **12-01-001-0005 ADMINISTRATION**

### **12-01-001-0005.1 FLOODPLAIN BOARD**

The City Council of Flagstaff, Arizona is hereby established as the Floodplain Board (the "Board").

#### **A. Powers of the Board:**

1. To delineate or by rule require developers of land to delineate, for areas where development is ongoing or imminent, and thereafter as development becomes imminent, floodplains consistent with criteria developed by the Federal Emergency Management Agency and the Director of Water Resources.
2. To adopt, amend, repeal, enforce, and otherwise administer floodplain management resolutions, rules, regulations, and orders pertaining to the delineated floodplains within the City of Flagstaff including comprehensive floodplain management and watercourse master plans, pursuant to the regulations of the City of Flagstaff setting forth requirements for the enactment and amendment of ordinances and resolutions.
3. To enter into cooperative agreements authorized by A.R.S. Section 48-3624.
4. To publicly hear and decide appeals and/or variance requests from the review, order, requirement, decision, or determination of the Floodplain Administrator.

### **12-01-001-0005.2 FLOODPLAIN ADMINISTRATOR**

The Stormwater Manager is hereby appointed as Floodplain Administrator. The Floodplain Administrator may delegate to others the duties and authority necessary to carry out the duties outlined in this Section. The Floodplain Administrator shall administer and implement these regulations by granting or denying Floodplain Use Permit applications in accordance with the provisions herein. The Floodplain Administrator shall have the authority to establish methods and standards for constructing the flood protection measures required by this Ordinance when the details of such methods and standards have not been specified by the Ordinance. The various Technical Bulletins published by FEMA are considered to be acceptable methods and standards, provided they are not less restrictive than requirements already established by other City standards and regulations.

#### **A. Duties of the Floodplain Administrator shall include, but not be limited to the following:**

1. Administer and enforce the provisions of these regulations.

2. Require Floodplain Use Permits for all proposed construction and other developments including the placement of manufactured homes and fill within SPECIAL FLOOD HAZARD AREAS as identified ON the FIRM.
3. Review all Floodplain Use Permits applications to determine that:
  - a. The permit requirements of these regulations have been satisfied;
  - b. All other required State and Federal permits pertaining to construction in floodplains and watercourses have been obtained;
  - c. The site is reasonably safe from flooding; and
  - d. The proposed development does not adversely affect the carrying capacity of SPECIAL FLOOD HAZARD AREAS, WHERE THE BASE FLOOD ELEVATION HAS BEEN DETERMINED. For purposes of these regulations, "adversely affect" means that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will NOT increase the water surface elevation of the base flood at any point.
4. Establish the criteria and policy by which consistent technical evaluations of the floodplain are made.
5. Formulate overall comprehensive floodplain management and watercourse master plans.
6. When Base Flood Elevation data has not been provided in accordance with Section 12-01-001-0004.02, the Floodplain Administrator shall obtain, review, and reasonably utilize any BASE FLOOD ELEVATION data available from a Federal, State, or other source, including data developed pursuant to paragraph 12-01-001- 0006.04, as criteria for requiring that new construction, substantial improvements, or other development in Zone A on the FIRM meet the provisions of these regulations. Any such information shall be consistent with the requirements of the Federal Emergency Management Agency and the Director of Arizona Department of Water Resources.
7. Delineate or by rule require developers of land located in Zones "A", or along watercourses that constitute a flood hazard as determined by the criteria established by the Arizona Department of Water Resources (ADWR) in State Standard 2-96 that do not have BASE FLOOD ELEVATION or floodway data, to delineate for areas where development is ongoing or imminent, floodplains and floodways consistent with criteria developed by the Federal Emergency Management Agency and the Director of the Arizona Department of Water Resources.
8. In those areas along a watercourse where the channel width, topography, and/or channel gradient clearly vary from the cross-section and profile data in the FIS, FIRM, and/or FBFM, the Floodplain Administrator may require a floodplain delineation re-study to ensure that the Base Flood Elevation data and horizontal location of the floodway and flood fringe are correctly shown on any property prior to development.
9. Obtain and maintain for public inspection and make available as needed for Flood Insurance Policies or affecting Increased Cost of Construction Coverage:

- a. The certified REGULATORY FLOOD ELEVATION required for residential structures in Section 12-01-001- 0006.1.A.3.c;
- b. The certification required for manufactured homes in Section 12-01-001-0006.5.A.1;
- c. The floodproofing certification required for floodproofed non-residential structures in Section 12-01- 001-0006.1.A.3.d.3;
- d. The certified elevation required for subdivisions in Section 12-01-001-0006.4.E;
- e. The flood vent certification required in Section 12-01-001-0006.A.3.f;
- f. Permit records for repair of flood-related damage to structures on a cumulative basis Improvements, modifications, and additions to existing buildings are counted cumulatively for the 10 years prior to the date of application for construction.
- g. The Floodplain Administrator shall require that the above certifications are provided using the most current version of the FEMA elevation certificate and Floodproofing certificate forms.
- h. Obtain and maintain improvement AND DAMAGE calculations.
- ~~i. Maintain a record of all variance actions, including justification for their issuance, and report such variances issued in the biennial report submitted to the Federal Emergency Management Agency.~~
- ~~j. Complete and submit a Biennial Report to the Federal Emergency Management Agency.~~

10. Whenever a watercourse is to be altered or relocated:

- a. Notify adjacent communities and the Arizona Department of Water Resources prior to such alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Emergency Management Agency (FEMA) through appropriate notification means;
- b. Require that the flood carrying capacity of the altered or relocated portion of said watercourse is maintained.
- c. Base FLOOD ELEVATION and rate of flow due to physical alterations:
  - (1) Base FLOOD ELEVATIONS may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, the Floodplain Administrator shall notify the Federal Emergency Management Agency (FEMA) of the changes by submitting technical or scientific data in accordance with Volume 44 Code of Federal Regulations section 65.3. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and floodplain management requirements will be based upon current data.

(2) Within one hundred twenty (120) days after completion of construction of any flood control protective works which changes the rate of flow during the flood or the configuration of the floodplain upstream or downstream from or adjacent to the project, the person or agency responsible for installation of the project shall provide to the governing bodies of all jurisdictions affected by the project a new delineation of all floodplains affected by the project. The new delineation shall be done according to the criteria adopted by the Director of the Arizona Department of Water Resources, CITY OF FLAGSTAFF, AND FEMA.

~~11. Within one hundred twenty (120) days after completion of construction of any flood control protective works which changes the rate of flow during the base flood or the configuration of the floodplain upstream or downstream from or adjacent to the project, the person, or agency responsible for installation of the project shall provide to the governing bodies of all jurisdictions affected by the project a new delineation of all floodplains affected by the project. The new delineations shall be done according to the criteria adopted by the Federal Emergency Management Agency (FEMA), the Director of the Arizona Department of Water Resources and the City of Flagstaff.~~

11. Advise the Flood Control District of Coconino County (the "District") and any adjacent jurisdiction having responsibility for floodplain management in writing and provide a copy of any development plan of all applications for Floodplain Use Permits or variances to develop land in a floodplain or floodway within one mile of the boundary between the City's area of jurisdiction and the area of jurisdiction of the District. Also, advise the District and any jurisdiction having responsibility for floodplain management in writing and provide a copy of any development plan of any major development proposed within a floodplain or floodway which could affect floodplains, floodways or watercourses outside the City's area of jurisdiction.

12. Make interpretations where needed as to the exact location of the boundaries of the SPECIAL FLOOD HAZARD AREAS (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). Any person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in Section 12-01-001-0007.1.

13. Take actions on violations of these regulations as required in Section 12-01-001-0004.10 herein.

14. Notify the Administrator and Director of the Arizona Department of Water Resources of acquisition by means of annexation, incorporation, or otherwise, of additional areas of jurisdiction.

B. Substantial Improvement and Substantial Damage Procedures.

Develop detailed procedures REFERENCING LAST FEMA SI/SD PUBLICATION for identifying and administering requirements for substantial improvement and substantial damage, to include defining "Market Value." Assure procedures are coordinated with other departments and divisions and implemented by city staff.

**12-01-001-0005.3 ESTABLISHMENT OF FLOODPLAIN USE PERMIT:**

A. Except as provided in ARS section 48-3625, a person shall not engage in any development which will divert, retard or obstruct the flow of waters in any watercourse without securing written authorization from the Floodplain Administrator. Where the watercourse is a delineated floodplain no development shall take place in the floodplain without written authorization from the FLOODPLAIN ADMINISTRATOR.

B. Floodplain Use Permit, issued by the Floodplain Administrator, shall be obtained prior to any construction or substantial improvement of any building, structure or portion thereof; including placement of manufactured homes; prior to the use or change of use of land, building or structure; prior to the change or extension of a non-conforming use; and prior to the placement of fill in the flood fringe. Application for a Floodplain Use Permit shall be made on forms furnished by the Floodplain Administrator.

C. The following information, at a minimum, is required for a Floodplain Use Permit application:

1. Plans in duplicate drawn to an engineering scale showing the nature, location, dimensions, and elevation of the area in question; existing and proposed structures, fill, storage of materials; and existing and proposed drainage facilities.
2. Proposed elevation in relation to mean sea level, of the lowest floor (including basement) of all structures. In Zone AO elevation of existing highest adjacent natural grade and proposed elevation of lowest floor of all structures.
3. Proposed elevation in relation to mean sea level to which any nonresidential structure will be flood proofed.
4. Certification by a REGISTERED PROFESSIONAL engineer or architect that the flood proofing methods for any nonresidential structure meet the flood proofing criteria in Section 12-01-001-0006.1.A.3.d.3.
5. Base FLOOD ELEVATION data for subdivision proposals or other development GREATER THAN 50 LOTS OR 5 ACRES, WHICHEVER IS THE LESSER.
6. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.
7. The signatures of all property owners for all property subject to the development request on the permit.
8. Surface (i.e., plan) view, drawn to an engineering scale, showing all elevation and contours; fill and storage elevations; sizes, locations and spatial arrangement of all proposed, anticipated, and existing structures on the site; location and elevations of streets, water supply and sanitary facilities.
9. Specifications for building construction and materials, filling, dredging, grading, channel improvements and changes, storage of materials, water supply and sanitary facilities.

D. The Floodplain Administrator may require the applicant to furnish additional information, data, and details as deemed necessary, by the Floodplain Administrator, to evaluate the effects of the proposed construction upon the floodplain, including without limitation:

1. A detailed floodplain analysis, performed by a registered professional engineer, of the flood profile, Base Flood Elevations, floodway, and velocities, using methodologies acceptable to the City of Flagstaff Floodplain Administrator, Director of the Arizona Department of Water Resources, and the Federal Emergency Management Agency (FEMA), including existing and anticipated uses.
2. Cross section showing the floodplain surrounding the watercourse, cross sections of the area to be occupied by the proposed development, and Base Flood Elevations.
3. A profile showing the slope of the flow line of the channel or thalweg of the watercourse.
4. A structural analysis by a registered professional engineer showing that any proposed structure(s) will be adequately designed and constructed to prevent flotation, collapse, or lateral movement of the structure(s) resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, scour and other erosion hazards.
5. Provide any other information needed to ensure that the proposed construction complies with this ordinance.

E. The Floodplain Administrator shall consider the following potential impacts upon review of all Floodplain Use Permit applications:

1. The effects upon lands upstream, downstream and in the immediate vicinity of the proposed development.
2. The effects upon the flood profile and channel stability.
3. The effects upon any tributaries to the main watercourse, drainage channels and any other drainage facilities or systems.
4. Whether the proposed use of a structure is intended for human occupancy.
5. The potential danger to persons upstream, downstream and in the immediate vicinity of the proposed development.
6. Whether any proposed changes in the watercourse will have an adverse environmental impact on the watercourse, including without limitation, erosion of streambanks and stream side trees, vegetation, and wildlife.
7. Whether any proposed water supply, sanitary sewer systems and other utility systems can prevent disease, contamination and unsanitary or hazardous conditions during a flood.
8. The relationship of the proposed development to elements of any applicable City of Flagstaff master plan or other floodplain management program.
9. Whether safe access is available to the proposed development in times of flood for ordinary and emergency vehicles.
10. Whether the cumulative effect of the proposed development, with other existing and anticipated uses, will increase flood heights.

11. Whether expected flood heights, velocities, duration, rate of rise, channel stability and sediment transport of the floodwaters expected at the site will adversely effect the development or the surrounding property.

F. Upon review of a Floodplain Use Permit application and consideration of the provisions of these regulations, the Floodplain Administrator may attach conditions to the approval of the Floodplain Use Permit as he/she deems necessary. Such conditions may include, but are not limited to:

1. Modification of waste disposal and water supply facilities.
2. Limitations on periods of use and operation.
3. Impositions of operational controls, sureties, and deed restrictions.
4. Requirements for construction of channel modifications, dikes, levees, and other protective measures.
5. Floodproofing measures as described in Section 12-01-001-0006.1.A.3.

G. The Floodplain Administrator shall act on an application for a Floodplain Use Permit within thirty (30) days from receipt of the complete application. If the Floodplain Administrator determines that the proposed use is located within the regulatory floodway and is prohibited under Section 12-01-001-0006.7, the Floodplain Administrator shall deny the application.

H. An applicant for a Floodplain Use Permit shall pay the floodplain use permit fee in Section 12-02-002-0003. If the Floodplain Administrator, pursuant to Section 12-01-001-0005.3.D.1, requires the applicant to furnish a floodplain study, the applicant shall also pay any applicable review fee established in Section 12-02-002-0003.

I. Every person who has obtained a Floodplain Use Permit shall conduct all construction authorized by said permit in accordance with the approved application, design, and permit conditions.

J. Prior to issuance of a Floodplain Use Permit, the applicant must submit evidence to the Floodplain Administrator that necessary State and Federal permits have been obtained.

K. The Floodplain Administrator may require deed restrictions or performance bonds, assurances or other security to ensure the performance of the conditions and restrictions imposed on the Floodplain Use Permit.

## **12-01-001-0006 PROVISIONS FOR FLOOD HAZARD REDUCTION**

### **12-01-001-0006.1 DEVELOPMENT STANDARDS IN FLOOD FRINGE AREAS**

A. In all ~~areas~~ of special flood hazard AREAS the following development standards are required:

1. Anchoring:

- a. All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy; and.
- b. All manufactured homes shall meet the anchoring standards of 12-01-001-0006.5.A.2.

2. Construction Materials and Methods:

- a. All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
- b. All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.
- c. All new construction, substantial improvements, and other proposed new development shall be constructed with electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities that are designed and/or located AT OR ABOVE THE REGULATORY FLOOD ELEVATION so as to prevent water from entering or accumulating within their components during conditions of flooding.
- d. All new construction, substantial improvements, and other development within Zones AH or AO shall be constructed so that adequate drainage paths around the structure(s) on slopes guide flood waters around and away from proposed or existing structures.
- e. All new construction, substantial improvements or other development shall be designed and constructed in accordance with the current City of Flagstaff Design and Construction Standards and Specifications and the City of Flagstaff Stormwater Management Design Manual.

3. Elevation and Floodproofing Requirements:

- a. All new and substantially improved or substantially damaged residential structures within Zones AE and AH of SPECIAL FLOOD HAZARD AREAS shall have the lowest floor (including basement) AND ATTACHED MACHINERY AND EQUIPMENT elevated at or above the REGULATORY FLOOD ELEVATION. Floodproofing of new residential structures is prohibited. Nonresidential structures may meet the standards in Section 12-01-001-0006.1.A.3.d and e. The lowest floor elevation is defined as the bottom of the lowest floor joist, horizontal structural member, or duct work.
- b. All new and substantially improved residential structures in Zone AO shall have the lowest floor (including basement) and attached machinery and equipment be elevated above the highest adjacent grade at least one foot higher than the depth number on the FIRM, or at least two feet if no depth number is specified. Nonresidential structures in AO Zones may meet the standards in Section 12-01-001-0006.1.A.3.d and e. Upon completion of the structure, a registered professional engineer or surveyor shall certify to the Floodplain Administrator that the elevation of the structure meets this standard.
- c. All new or substantially improved residential structures shall have the lowest floor elevation certified by a REGISTERED PROFESSIONAL engineer or surveyor or architect

and provide an elevation certificate to the Floodplain Administrator. IN ZONES AE AND AH, THE BASE FLOOD ELEVATION IS DETERMINED FROM THE FIS AND/OR FIRM.

D. A GARAGE ATTACHED TO A RESIDENTIAL STRUCTURE, CONSTRUCTED WITH THE GARAGE FLOOR SLAB BELOW THE REGULATORY FLOOD ELEVATION, MUST BE DESIGNED TO ALLOW FOR THE AUTOMATIC ENTRY AND EXIT OF FLOOD WATERS AND MUST BE USED SOLELY FOR PARKING, ACCESS AND/OR STORAGE. SEE {THE NUMBERING SYSTEM USED BY THE COMMUNITY}.

E. Nonresidential structures shall either be elevated in conformance with Section 12-01-001- 0006.1.A.3.a. through ce. or together with attendant utility and sanitary facilities:

1. be flood proofed so that below the regulatory flood level the structure is watertight with walls substantially impermeable to the passage of water;
2. have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and
3. be certified by a REGISTERED PROFESSIONAL engineer or architect that the standards of this subsection are satisfied. An elevation certificate shall be provided to the Floodplain Administrator prior to issuance of a building permit.

E. Whenever flood proofing measures are required, a REGISTERED professional engineer or architect shall develop and/or review structural design, specifications, and plans for the construction, and design and methods of construction are in accordance with accepted standards of practice for meeting the applicable provisions of these regulations. The following measures shall be utilized, where appropriate, to ensure that design, specifications, and methods of construction will withstand flood depths, pressures, velocities, impact, and uplift forces and other factors associated with flooding:

- (1) anchoring of structures, or addition of mass or weight to structures to prevent flotation;
- (2) reinforcement of walls and floors to resist rupture or collapse caused by water pressures or floating debris;
- (3) construction of wells, water supply systems and wastewater treatment/disposal systems so as to prevent the entrance of flood waters into such systems;
- (4) subsurface drainage systems to relieve external pressures on foundation walls or basement floors;
- (5) cut-off valves or backflow prevention devices on sewer lines or the elimination of gravity flow basement drains; and
- (6) placement of utilities at or above the REGULATORY FLOOD ELEVATION.

G. For all new construction and substantial improvements, fully enclosed areas below the lowest floor that are useable solely for parking of vehicles, building access, or storage in an area other than a basement and which are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry

and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or meet or exceed the following minimum criteria:

(1) A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided on opposite sides of each enclosed area, if physically possible. If a structure has more than one enclosed area, each area must have openings on exterior walls to allow floodwater to enter and exit directly.

(2) The bottom of all openings shall be no higher than one foot above the adjacent grade; and

(3) Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters. Openings which require human intervention will not meet the requirement for an opening.

FOR ENGINEERED OPENINGS:

ENGINEERED OPENINGS (OR COVERS AND DEVICES) THAT ARE SPECIFICALLY DESIGNED AND CERTIFIED BY A REGISTERED ENGINEER OR ARCHITECT AS MEETING THE REQUIRED PERFORMANCE AND DESIGN REQUIREMENTS.

ENGINEERED OPENINGS (OR COVERS AND DEVICES) FOR WHICH AN EVALUATION REPORT HAS BEEN ISSUED BY THE INTERNATIONAL CODE COUNCIL (ICC) EVALUATION SERVICE, INC. (ICC-ES), A SUBSIDIARY OF THE INTERNATIONAL CODE COUNCIL, INC.

(4) A garage door, which does not have an opening in conformity with the design criteria in Section 12-01-001-0006.1.A.3.f, does not meet the requirement for an opening.

H. Additions to existing structures or buildings shall be constructed such that the lowest floor is in conformity with the standards set forth in Section 12-01-001-0006.1.A.3.

I. Manufactured homes shall meet the standards set forth in Section 12-01-001-0006.1 and also the standards set forth in Section 12-01-001-0006.5.

4. Structural fill shall be allowed within the flood fringe, under a Floodplain Use Permit, to the extent that it is not prohibited under any other regulation and the following standards are met:

a. Fill which is intended to elevate a structure at or above the REGULATORY FLOOD ELEVATION must be designed and compacted to 95 percent of the maximum density obtainable with the Standard Proctor Test method issued by the American Society for Testing and Materials (ASTM Standard D-698) or other equivalent method. The fill must extend a minimum of 15 feet, or as approved by the Floodplain Administrator, beyond the exterior walls of any structure erected thereon before dropping below the BASE FLOOD ELEVATION. Fill must be designed and certified by A REGISTERED PROFESSIONAL

engineer.

b. Fill slopes for granular material can be no steeper than two horizontal to one vertical unless substantiating data, prepared by a REGISTERED PROFESSIONAL soils engineer or engineering geologist, justifying steeper slopes is provided.

c. Adequate protection must be provided for fill slopes exposed to flood waters with velocities of five feet per second or less by covering the slopes with grasses, or other equivalent planting that is able to withstand the design velocities.

d. Adequate protection must be provided for fill slopes exposed to flood waters with velocities greater than five feet per second by armoring the slopes in accordance with the standards in the City of Flagstaff Stormwater Management Design Manual.

e. New structures constructed on structural fill must have the lowest floor elevation in conformance with Section 12-01-001-0006.1.A.3 herein.

5. All temporary and permanent structures shall be anchored to prevent flotation, which could result in damage to other structures, restriction of bridge openings and other sections of the regulatory floodway.

6. Attendant utility and sanitary facilities for new construction and substantial improvements shall be elevated and/or flood proofed to the Regulatory Flood Elevation.

7. Garages and low cost accessory structures

a. Attached garages.

(1) A garage attached to a residential structure, constructed with the garage floor slab below the REGULATORY FLOOD ELEVATION, must be designed to allow for the automatic entry of flood waters. See Section 12-01-001-0006.1.A.3.f. Areas of the garage below the REGULATORY FLOOD ELEVATION must be constructed with flood resistant materials. See Section 12-01-001-0006.1.A.2.

(2) A garage attached to a nonresidential structure must meet the above requirements or be dry floodproofed.

b. Detached garages and accessory structures.

~~(1) "Accessory structure" used solely for parking (2 car detached garages or smaller) or limited storage (small, low-cost sheds 200 sq ft or less), may be constructed such that its floor is below the Regulatory Flood Elevation, provided the structure is designed and constructed in accordance with the following requirements:~~

(1) FEMA PUBLICATION P-2140: FLOODPLAIN MANAGEMENT REQUIREMENTS FOR AGRICULTURAL STRUCTURES AND ACCESSORY STRUCTURES, DEFINES AN ACCESSORY STRUCTURE AS: FOR FLOODPLAIN MANAGEMENT PURPOSES, ACCESSORY STRUCTURES ARE STRUCTURES THAT ARE ON THE SAME PARCEL OF PROPERTY AS A PRINCIPAL STRUCTURE, THE USE OF WHICH IS INCIDENTAL TO THE USE OF THE PRINCIPAL STRUCTURE. ACCESSORY STRUCTURES MUST BE USED FOR PARKING OR STORAGE, BE

SMALL AND REPRESENT A MINIMAL INVESTMENT BY OWNERS, AND HAVE LOW DAMAGE POTENTIAL. FEMA CONSIDERS "SMALL" TO MEAN NOT LARGER THAN A ONE-STORY TWO-CAR GARAGE. EXAMPLES OF SMALL ACCESSORY STRUCTURES INCLUDE, BUT ARE NOT LIMITED TO, DETACHED GARAGES, STORAGE AND TOOL SHEDS, AND SMALL BOATHOUSES.

(2) STRUCTURE SIZE - THE FOOTPRINT OF A TYPICAL TWO-CAR GARAGE IS ABOUT 600 SQUARE FEET IN AREA. OR LIMITED STORAGE (SMALL, LOW COST SHEDS 200 SQ. FT. OR LESS).

(3) STORAGE - CONTENTS STORED IN WET FLOODPROOFED STRUCTURES WILL GET WET DURING FLOODING.

- (a) Use of the accessory structure must be limited to parking or limited storage;
- (b) The portions of the accessory structure located below the REGULATORY FLOOD ELEVATION must be built using flood-resistant materials;
- (c) The accessory structure must be adequately anchored to prevent flotation, collapse and lateral movement;
- (d) Any mechanical and utility equipment in the accessory structure must be elevated or floodproofed to or above the REGULATORY FLOOD ELEVATION;
- (e) The accessory structure must comply with floodplain encroachment provisions in Section 12-01-001-0006.7; and
- (f) The accessory structure must be designed to allow for the automatic entry of flood waters in accordance with Section 12-01-001-0006.1.A.3.f.1.

c. Detached garages and accessory structures not meeting the above standards must be constructed in accordance with all applicable standards in Section 12-01-001-0006.

UPON COMPLETION OF THE STRUCTURE, CERTIFICATION BY A REGISTERED PROFESSIONAL ENGINEER OR SURVEYOR THAT THE REQUIREMENTS OF THIS SECTION HAVE BEEN SATISFIED SHALL BE PROVIDED TO THE FLOODPLAIN ADMINISTRATOR FOR VERIFICATION.

#### **12-01-001-0006.2 STANDARDS FOR STORAGE OF MATERIALS AND EQUIPMENT:**

A. The storage or processing of materials that are, in time of flooding, buoyant, flammable, explosive, toxic, or could be injurious to human, animal, or plant life is prohibited IN SPECIAL FLOOD HAZARD AREAS.

B. Storage of other material or equipment may be allowed if not subject to major damage by floods, and if firmly anchored to prevent flotation, or if readily removable from the area within the time available after flood warning.

#### **12-01-001-0006.3 STANDARDS FOR UTILITIES:**

- A. All new or replacement water supply and sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the system and discharge from systems into flood waters.
- B. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.
- C. Waste disposal systems shall not be installed wholly or partially in a regulatory floodway.
- D. All areas within the Floodplain that are disturbed as a result of the construction or maintenance of underground utilities must be restored to pre-construction conditions including, but not limited to, re-seeding, re-vegetating and restoring the same grade.

#### **12-01-001-0006.4 STANDARDS FOR SUBDIVISIONS:**

- A. All preliminary subdivision proposals and other proposed development (including proposals for manufactured home parks and subdivisions), GREATER THAN 50 LOTS OR 5 ACRES, shall identify the Special Flood Hazard Areas and the Base Flood Elevation.
- B. A preliminary drainage report is required for all preliminary plat submittals in accordance with the City of Flagstaff Stormwater Management Design Manual. A final drainage report which technically demonstrates compliance with these regulations and the Stormwater Management Design Manual is required to be submitted and accepted prior to approval of subdivision construction plans and recording of the final plat.
- C. All subdivision proposals or other developments must provide BASE FLOOD ELEVATION data.
- D. All final subdivision plats within SPECIAL FLOOD HAZARD AREAS shall show the limits of the base flood, BASE FLOOD ELEVATIONS, and floodway. All final subdivision plans shall provide the minimum lowest floor elevation(s) of proposed structure(s) and pads.
- E. In SPECIAL FLOOD HAZARD AREAS, all final subdivision construction plans shall provide the minimum lowest floor elevations of proposed structures and elevations of the engineered pads. If the site is filled above the base flood, the lowest floor and pad elevations shall be certified by A REGISTERED PROFESSIONAL engineer or surveyor and provided to the Floodplain Administrator. The subdivider must complete a revision of the Flood Insurance Rate Map for any areas filled above the BASE FLOOD ELEVATION.
- F. All subdivision proposals and other proposed development shall be consistent with the need to minimize flood damage.
- G. All subdivision proposals and other proposed development shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage.
- H. All subdivision proposals and other proposed development shall provide adequate drainage to reduce exposure to flood hazards.
- I. All subdivisions shall provide stormwater facilities in accordance with the City of Flagstaff

**12-01-001-0006.5 STANDARDS FOR MANUFACTURED HOMES, MANUFACTURED HOME PARKS AND SUBDIVISIONS, AND RECREATIONAL VEHICLES:**

A. All new and replacement manufactured homes, additions to manufactured homes, and recreational vehicles which are left on site for more than 180 days or are not licensed and ready for highway use shall:

1. Be elevated so that the bottom of the structural frame or the lowest point of any attached appliances, whichever is lower, is at or above the REGULATORY FLOOD ELEVATION.
2. Be securely anchored to an adequately anchored foundation system to resist flotation, collapse, or lateral movement capable of resisting forces of at least four thousand eight hundred (4,800) pounds. This requirement is in addition to applicable State and local anchoring requirements to withstand wind forces. One of the following methods shall be used:
  - a. by providing over-the-top to ground anchors at each of the four corners of the manufactured home. Manufactured homes fifty (50) feet or more in length must have two (2) additional ties per side at intermediate locations and manufactured homes less than fifty (50) feet in length must have one (1) additional over-the-top tie per side; or by providing frame ties at each of the four corners of the manufactured home. Manufactured homes fifty (50) feet or more in length must have five (5) additional ties per side, and manufactured homes less than fifty (50) feet in length must have four additional frame ties per side. 44 CFR § 60.3(B)(8).
3. The manufactured home chassis must be supported by reinforced piers or other foundation elements of at least equivalent strength that are no more than thirty-six (36) inches in height above grade and be securely anchored to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.
4. Any additions to a manufactured home must be similarly anchored.

UPON COMPLETION OF INSTALLATION OF THE MANUFACTURED HOME, CERTIFICATION BY A REGISTERED PROFESSIONAL ENGINEER OR SURVEYOR THAT THE ELEVATION REQUIREMENTS OF THIS SECTION HAVE BEEN SATISFIED SHALL BE PROVIDED TO THE FLOODPLAIN ADMINISTRATOR FOR VERIFICATION.

B. Minimum Requirements for Manufactured Home Parks and Manufactured Home Subdivisions:

1. Adequate surface drainage and vehicular access for a manufactured home transport vehicle shall be provided.
2. All manufactured homes shall be placed on pads, lots elevated on compacted fill or pilings so that the bottom of the structural frame or the lowest point on any attached appliances, whichever is lower, is at or above the Regulatory Flood Elevation. If elevated on pilings:
  - a. the lots shall be large enough to permit steps;
  - b. the pilings shall be placed in stable soil no more than ten (10) feet apart; and

c. reinforcement shall be provided for pilings more than six (6) feet above the ground level.

C. No manufactured home, recreational vehicle, new manufactured home park, or enlargement of an existing manufactured home park shall be permitted in the regulatory floodway.

D. Recreational vehicles placed on sites within Zones A, AH, AE and AO must meet the following requirements:

1. be on the site for fewer than 180 consecutive days;
2. be fully licensed and ready for highway use. A recreational vehicle is ready for highway use if it is on wheels or a jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions; or
3. recreational vehicles not meeting the criteria in items 1 and 2 must meet the requirements of Section 12-01-001-0006.5.A.

#### **12-01-001-0006.6 RESERVED FOR FUTURE USE**

#### **12-01-001-0006.7 DEVELOPMENT STANDARDS FOR REGULATORY FLOODWAYS:**

Located within THE SPECIAL FLOOD HAZARD AREAS established in Section 12-01-001-0004.02 are areas designated as regulatory floodways. The following provisions shall apply to regulatory floodways:

A. The following are prohibited in, on, or over the regulatory floodway unless removed by a FEMA map revision: Encroachments, including fill, new construction, additions to existing structures which increase the building footprint, storage of materials or equipment, manufactured homes, recreational vehicles, or other development are prohibited. Substantial improvements are prohibited within the regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed substantial improvement would not result in any increase in flood levels within the community during the occurrence of the base flood. DOCUMENTED BY A NO-RISE CERTIFICATE. All new construction and substantial improvements shall comply with all other applicable flood hazard reduction provisions of Section 12-01-001-0006.

B. Storage of materials that are buoyant, flammable, explosive or injurious to human, animal, plant, fish or other aquatic life is prohibited in, on or over the regulatory floodway.

C. Any solid or hazardous waste disposal facility is prohibited in, on or over the regulatory floodway.

D. Any wastewater treatment facility or pond is prohibited in, on or over the regulatory floodway. New private sewage systems, or additions to existing private sewage systems are prohibited in, on or over the regulatory floodway.

E. Zone A, for which a regulatory floodway has not been delineated, shall be deemed in entirety as regulatory floodway for the purposes of these regulations.

F. Uses having low flood-damage potential and not obstructing flood flows shall be permitted in the regulatory floodway to the extent that they are not prohibited by any other regulation, and

provided they do not require structures, fill or storage of materials and equipment, or anything which will significantly impede or obstruct flood flows. Such uses include:

1. Agricultural uses such as general farming, pasture and forestry but, does not include permanent crops which would constitute an obstruction to flood flows.
2. Functionally dependent uses, industrial/commercial loading areas and parking lots. Overnight parking and unattended vehicles are prohibited in the regulatory floodway.
3. Private and public recreational uses including but not limited to: golf courses, driving ranges, picnic grounds, swimming areas, parks, ball or multi-use fields, shooting preserves, target ranges, trap and skeet ranges, hunting and fishing areas, hiking and horseback trails.
4. Functions that serve the public interest and that will not cause a rise in the floodway elevation. Such uses include but are not limited to: water conservation, power and water quality service facilities and related works; remedial or corrective actions; environmental restoration; flood control facilities and related works; public roadways and bridges; fish and wildlife enhancement activities; emergency action assistance; public health assistance; utility transmission lines, pipelines, and water monitoring devices.

#### **12-01-001-0006.8 MISCELLANEOUS PROVISIONS:**

A. The Floodplain Administrator shall review and approve all development permits before issuance to ensure compliance with the provisions of these regulations.

B. Lateral additions to existing structures must meet all requirements of this Ordinance. If the Lateral Addition constitutes a Substantial Improvement to the existing structure then both the addition and the existing structure must meet all requirements of this Ordinance. The exception to this is for lateral additions located in the flood fringe, if the Lateral Addition is connected to the existing structure by only one doorway, not exceeding 36 inches in width, and minimal finishing is done to the common wall.

C. Substantial improvements to existing structures shall be counted on a cumulative basis for the 10 years prior to the date of application for construction. Additions to existing structures shall be included in the determination of a substantial improvement to the original structure. The property owner or permit applicant may have the option of having the structure independently appraised, the cost of which shall be assumed by the property owner or permit applicant, to be used as the market value. A copy of the certified appraisal must be submitted to the Floodplain Administrator.

D. The development of all land within the City of Flagstaff must include provisions for the management of stormwater runoff from the property which is to be developed. This management shall consist of stormwater storage facilities or other mitigation measures for rainfall events up to and including the one-hundred year event, in accordance with the City of Flagstaff Stormwater Management Design Manual.

E. No street shall be used as a major carrier of stormwater from adjacent lands in lieu of natural washes, man-made channel, or storm drains. Streets shall be used for local runoff only. In all cases the flow of water from public streets shall be confined in public rights-of-way or drainage easements.

F. All lots, structures, etc. within a development shall be accessible over terrain which can be traversed by conventional motor vehicles from the boundary of that development during the one-hundred year flood. Boundary shall include any adjacent street(s). At least one access route shall be accessible with a maximum water depth of one foot over the top of the access route or road during the one-hundred year flood.

G. Parking lots are permitted within the floodplain provided that:

1. All vehicles are fully licensed, ready for highway use, and are not unattended. The term "unattended" shall mean that the owner or authorized driver cannot reasonably be expected to be available to remove the vehicle before flooding occurs.
2. Any parking lot subject to flooding shall have a prominent sign posted at each entrance stating "Warning, parking lot subject to flooding".
3. Overnight parking is prohibited in the regulatory floodway and shall be limited to flood fringe areas where the flooding does not exceed one foot of depth during the one-hundred year flood.

H. An erosion hazard and building setback from the top of the channel bank is required for all new development to create a buffer and to provide access to the channel for possible maintenance and improvements work. This buffer shall be designated by the Floodplain Administrator according to the flood-related erosion hazard and erosion rates in relation to the anticipated "useful life" of structures, and depending upon the geologic, hydrologic, topographic, and climatic characteristics of the land. The minimum setback shall be ten (10) feet. The buffer may be used for suitable open space purposes, such as for agriculture, forestry, outdoor recreation, wildlife habitat areas, landscaping and for other activities using temporary and portable structures only.

I. A waiver to the setback requirements may be granted by the Floodplain Administrator if it can be demonstrated that adequate erosion and flow velocity protection can and will be constructed and maintained, and vehicular maintenance access along the top of the channel bank is not required. All plans for erosion and flow velocity protection must be prepared by A REGISTERED PROFESSIONAL engineer and reviewed and approved by the Floodplain Administrator.

J. No new critical facility shall be constructed within the 100 or 500-year floodplain.

K. No person shall change the use of an existing structure from a nonresidential use to a residential use without compliance with the provisions of these regulations.

L. The design and evaluation of all new floodplain and stormwater management facilities shall be in accordance with the policies and design criteria set forth in the City of Flagstaff Stormwater Management Design Manual.

M. Private Drainage Infrastructure that was required to be constructed as a condition of development, such as detention basins, Low Impact Development (LID) facilities, culverts and open channels, shall be maintained by the private property owner, or responsible party(s), to ensure proper function pursuant to the approved design.

N. In order to provide for properly sized drainage infrastructure and to minimize the need for

the upsizing of drainage infrastructure in the future, drainage infrastructure shall be sized according to the best available hydrologic and hydraulic data including, but not limited to Drainage Master Plans, future conditions modeling and other drainage studies as may be approved by the City.

## **12-01-001-0007 VARIANCE PROCEDURE**

### **12-01-001-0007.1 APPEAL AND VARIANCE BOARD**

A. The Floodplain Board (the "Board") of the City of Flagstaff shall hear and decide appeals and requests for variances from the requirements of these regulations.

B. The Board shall hear and decide appeals when it is alleged there is an error in any requirement, decision, or determination made by the Floodplain Administrator in the enforcement or administration of these regulations.

~~C. The Board shall hear and decide variance requests from the provisions of these regulations.~~

~~C. D.~~ Applications for an appeal or variance shall be made on forms and in accordance with procedures furnished by the Floodplain Administrator. Persons requesting an appeal or variance shall pay a fee in the amount of three hundred dollars (\$300.00). Upon receipt of the appeal/variance request, fee, and all required information, the Floodplain Administrator shall schedule the request before the Board within thirty (30) calendar days.

~~D. E.~~ The Board shall conduct hearings on all appeals and variance requests and all hearings shall be open to the public. Notice of the public hearing shall be published in a newspaper of general circulation a minimum of fifteen (15) days prior to the hearing.

~~E. F.~~ The Board shall render a written decision on an appeal or variance within thirty (30) calendar days from the date of the public hearing. When additional information is required by the Board, the Board shall render a decision within thirty (30) calendar days from receipt of such information.

~~F. G.~~ In ~~passing~~ **CONSIDERING** ~~upon~~ such applications, the Board shall consider all technical evaluations, all relevant factors, standards specified in other sections of these regulations, and:

1. The danger that materials may be swept onto other lands to the injury of others;
2. The danger of life and property due to flooding or erosion damage;
3. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
4. The importance of the services provided by the proposed facility to the community;
5. The necessity to the facility of a waterfront location, where applicable;
6. The availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;

7. The compatibility of the proposed use with existing and anticipated development;
8. The relationship of the proposed use to the comprehensive plan and floodplain management program for that area;
9. The safety of access to the property in time of flood for ordinary and emergency vehicles;
10. The expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters expected at the site; and,
11. The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, water system, and streets and bridges.

**G.H.** The Floodplain Administrator shall maintain a record of all variance actions, including justification for their issuance and report such variances issued in its biennial report submitted to the Federal Emergency Management Agency.

## **12-01-001-0007.2 VARIANCES**

### **A. NATURE OF VARIANCES**

The variance criteria set forth in these regulations are based on the general principle of zoning law that variances pertain to a piece of property and are not personal in nature. A variance may be granted for a parcel of property with physical characteristics so unusual that complying with the requirements of this Ordinance would create an exceptional hardship to the applicant or the surrounding properties. Mere economic or financial hardship alone is not exceptional. The characteristics must be unique to the property and not be shared by adjacent parcels. The unique characteristic must pertain to the land itself, not the structure, its inhabitants, or the property owners.

It is the duty of the Floodplain Board to help protect its citizens from flooding. This need is so compelling and the implications of the cost of insuring a structure built below the **REGULATORY FLOOD ELEVATION** are so serious that variances from the flood elevation or from other requirements in the flood ordinance are quite rare. The long-term goal of preventing and reducing flood loss and damage can only be met if variances are strictly limited. Therefore, the variance guidelines provided in this ordinance are more detailed and contain multiple provisions that must be met before a variance can be properly granted. The criteria are designed to screen out those situations in which alternatives other than a variance are more appropriate.

### **B. CONDITIONS FOR VARIANCES**

1. Variances may be issued for the repair, rehabilitation, or restoration of structures listed in the National Register of Historic Places or the State Inventory of Historic Places, upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.
2. Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.

3. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
4. Variances shall only be issued upon:
  - a. A showing of good and sufficient cause;
  - b. A determination that failure to grant the variance would result in exceptional hardship to the applicant;
  - c. A showing that the use cannot perform its intended purpose unless it is located or carried out in close proximity to water. This includes only facilities defined in Section 12-01-001-0003 of these regulations in the definition of "Functionally Dependent Use"; and
  - d. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of, the public, or conflict with existing local laws or ordinances.
5. Generally, variances may be issued for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing items 12-01-001-0005 and 12-01-001-0006 have been fully considered. As the lot size increases beyond one-half acre, the technical justification required for issuing the variance increases.
6. Upon consideration of the factors of Section 12-01-001-0007.1 and the purposes of these regulations, the Floodplain Board may attach such conditions to the granting of variances as it deems necessary to further the purposes of these regulations.
7. Any applicant to whom a variance is granted shall be given written notice over the signature of Floodplain Administrator that:
  - a. The issuance of a variance to construct a structure below the ~~base~~ **REGULATORY** flood level will result in increased premium rates for flood insurance coverage; and
  - b. Such construction below the base flood level increases risks to life and property.

Such notification shall be maintained with a record of all variance actions as required in Paragraph 12-1-7-1.8. of these regulations. ~~Such notice will also state that the land upon which the variance is granted shall be ineligible for exchange of land pursuant to any flood relocation and land exchange program~~ A copy of the notice shall be recorded by the Board in the Office of the Coconino County Recorder and shall be recorded in a manner so that it appears in the chain of title of the affected parcel of land.

8. If the Floodplain Board has cause to believe, after approval of a variance, that any stipulations or conditions may have been violated, the Floodplain Board may set a hearing for the purpose of determining to revoke the variance for such violation. The Floodplain Board may revoke the variance for finding a violation of the stipulations or conditions or it may grant a limited time in which to correct the violation in order to avoid revocation of the variance.

### **12-01-001-0007.3 APPEALS**

A person may appeal to the Board for a judgment on the interpretation of the provisions of these regulations when it is alleged there is an error in any requirement, decision, or determination made by the Floodplain Administrator in the enforcement or administration of these regulations.

#### **12-01-001-0009 AMENDMENTS**

The provisions of these regulations may, from time to time, be amended, supplemented, changed or repealed, as provided in the Arizona Revised Statutes. However, no such action may be taken until a public hearing in relation thereto has been held, at which time parties in interest and citizens shall have an opportunity to be heard. At least fifteen (15) days notice of the time and place of such hearing shall be published in a newspaper of general circulation.

A full text of any proposed amendments to these regulations shall be available for inspection by the public at the office of the Floodplain Administrator at least fifteen (15) days prior to the date of the amendment hearing.

#### **12-01-001-0010 SEVERABILITY:**

These regulations and the various parts thereof are hereby declared to be severable. Should any section of these regulations be declared by the courts to be unconstitutional or invalid, such decision shall not affect the validity of these regulations as a whole, or any portion thereof other than the section so declared to be unconstitutional or invalid.

#### **12-01-001-0011 RESERVED FOR FUTURE USE**

#### **12-01-001-0012 RESERVED FOR FUTURE USE**

**ORDINANCE NO. 2024-20**

**AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF FLAGSTAFF, AMENDING THE FLAGSTAFF CITY CODE, TITLE 12 FLOODPLAINS, CHAPTER 12-01 FLOOD PLAIN REGULATIONS, BY ADOPTING BY REFERENCE THAT CERTAIN DOCUMENT ENTITLED “2024 REVISIONS TO FLOODPLAIN REGULATIONS”; PROVIDING FOR PENALTIES, REPEAL OF CONFLICTING ORDINANCES, SEVERABILITY, AND ESTABLISHING AN EFFECTIVE DATE**

**RECITALS:**

WHEREAS, the City of Flagstaff has established policies, codes and regulations related the floodplain; and

WHEREAS, the City of Flagstaff continues to create and improve policies, codes and regulations related to the floodplain; and

WHEREAS, the City of Flagstaff requires residents to comply with said floodplain policies, codes and regulations; and

WHEREAS, the requirements found in Flagstaff’s City Code related to the floodplain are updated when needed; and

WHEREAS, Chapter 12-01 of the Flagstaff City Code which is entitled “Floodplain Regulations” contains language that should be aligned with language of the Federal Emergency Management Agency (FEMA); and

WHEREAS, from time to time, the City Council for the City of Flagstaff can update, add to, or amend the floodplain regulations to provide come into better alignment with state and federal regulations; and

WHEREAS, the City Council has determined that policies, codes and regulations related to the floodplain should be updated to align with the regulations of FEMA for management of the floodplain in the City of Flagstaff.

**ENACTMENTS:**

**NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF FLAGSTAFF AS FOLLOWS:**

SECTION 1. That certain document known as “2024 Revisions to Floodplain Regulations”, one(1) paper copy and (1) electronic copy of which are on file in the office of the City Clerk of the City of Flagstaff, Arizona, has been declared a public record by Resolution No. 2024-32 of the City of Flagstaff, Arizona, is hereby referred to, adopted and made a part hereof as if fully set out in this ordinance.

SECTION 2. Repeal of Conflicting Ordinances

All ordinances and parts of ordinances in conflict with the provisions of the code adopted herein are hereby repealed.

**SECTION 3. Severability**

If any section, subsection, sentence, clause, phrase or portion of this ordinance or any part of the code adopted herein by reference is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

**SECTION 4. Clerical Corrections**

The City Clerk is hereby authorized to correct clerical and grammatical errors, if any, related to this ordinance, and to make formatting changes appropriate for purposes of clarity, form, or consistency with the Flagstaff City Code.

**SECTION 5. Effective Date**

This Ordinance shall be effective thirty (30) days following adoption by the City Council.

PASSED AND ADOPTED by the City Council of the City of Flagstaff this 2nd day of July, 2024.

\_\_\_\_\_  
MAYOR

ATTEST:

\_\_\_\_\_  
CITY CLERK

APPROVED AS TO FORM:

\_\_\_\_\_  
CITY ATTORNEY

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Trevor Henry, Capital Improvements Engineer  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



**TITLE:**

**Consideration and Approval of Contract:** Second Amendment to the Construction Manager at Risk (CMAR) Construction Phase Services Agreement with Eagle Mountain Construction, Inc. for the Spruce Wash Flood Mitigation Suite of Projects to add Guaranteed Maximum Price (GMP) 3.

**STAFF RECOMMENDED ACTION:**

1. Approve the Second Amendment to the CMAR Construction Phase Services Agreement with Eagle Mountain Construction, Inc. for the Spruce Wash Flood Mitigation Suite of Projects to include GMP 3 in the amount of \$2,907,375.00 and adding 0 days to the contract duration; and
2. Approve an Owner's Contingency of \$50,000, which is approximately 2.0% of Guaranteed Maximum Price #3; and
3. Authorize the City Manager to execute the necessary documents.

**Executive Summary:**

Staff recommends approval of the Second Amendment to the CMAR Construction Phase Services Agreement No. 2023-60, with Eagle Mountain Construction (EMC), for the Spruce Wash Flood Mitigation Suite of Projects (the Suite) to include GMP 3 in the amount of **\$2,907,375.00**, an Owner's Contingency of **\$50,000**, and adding 0 days to the contract duration. Approval of this Second Amendment will authorize construction of the Linda Vista to Cedar Channel Project. The remaining Projects within the Suite will be presented for Council's consideration at a later date as the Third Amendment to this Agreement with GMP#4. Please refer to the attached context and vicinity maps.

Construction of the Suite of Projects began in September of 2023 with GMP#1 for the underground utilities portion of the Grandview Project and Wedge Clearing. Amendment One, GMP#2 began in March of 2024 and includes the utility relocations for the Linda Vista to Cedar Channel, Grandview Street Improvements, the Linda Vista Crossing and the Wedge Utilities. Amendment one extended construction to 1,025 days to cover construction of the entire Suite spanning over four construction seasons with a target completion prior to monsoon season of 2026. Design is nearing completion on the remaining projects within the Suite and is anticipated to be completed this summer 2024. The final scheduling and construction sequencing of the Suite will be determined once designs and other funding source requirements are known.

The majority of the improvements in the Suite of Projects will be constructed within City property, in City right-of-way, and or within the existing public utility and drainage easement along Spruce Wash. This Second Amendment adding GMP 3 requires an access and drainage easement from one property owner and temporary construction easements for final grading from four property owners along the channel. The concrete channel is located entirely with an existing drainage and public utilities easement.

**Financial Impact:**

The Second Amendment adding GMP 3 plus expenditures from the owner's contingency will be funded by Proposition 441 Funds under the GO Capital Project Fund from the 2024/25 fiscal year in the amount of **\$2,957,375.00**, Account Number 410-08-385-3525-3, Cedar to Linda Vista Channel project.

The total project budget:

Project / Portion of Project	FY2023-24	FY2024-25	Budget Line	Account Number
Linda Vista to Cedar Channel	\$757,055	\$3,328,095	Cedar to Linda Vista Channel	410-08-385-3525-3

**Policy Impact:**

No impact.

**Previous Council Decision or Community Discussion:**

- Council previously approved the ballot language for the November 2022 voter approved Proposition 441 Wildfire, Flood, and Wastewater Infrastructure Bond, which dedicated \$26 million towards flood mitigation projects
- Council previously approved the Agreement with EMC for the Suite of Projects for GMP#1 on July 3, 2023.
- Council previously approved Amendment One with EMC for the Suite of Projects for GMP #2 on March 5, 2024.

**Options and Alternatives to Recommended Action:**

1. Approve the Second Amendment as recommended. Approval will allow work to move forward; or,
2. Reject approval of the award as recommended. This action would delay the Project.
  - a. If rejection occurs, possible options include:
    - i. Ask staff to re-evaluate the recommendation; or
    - ii. Suspend or cancel the Project completely.

**Background and History:**

On July 21, 2019, the Museum Fire broke out in the Dry Lake Hills area just above Flagstaff within the Coconino National Forest. The fire ultimately charred 1,961 acres, including a significant portion of the Spruce Wash Watershed. Flood modeling subsequently showed potential flood risk to neighborhoods in Coconino County and the City of Flagstaff. Throughout the summer of 2021, monsoon rain events impacted the Museum burn scar and caused multiple rounds of flash flooding in Flagstaff neighborhoods.

In the November 2022 election, voters approved Proposition 441 with support from 76% of Flagstaff voters. The Proposition invests \$57 million in City of Flagstaff wildfire suppression, stormwater flood mitigation and wastewater treatment infrastructure. Specifically, \$26 million of this funding will be used to fund stormwater infrastructure improvements in the Spruce Wash area to lessen the impacts of flooding in affected neighborhoods.

The development of the Spruce Wash Technical Feasibility Study Phase I and Phase II conducted by Peak Engineering identified eight Projects to be constructed with the \$26 million in funding from Prop 441 to mitigate post-wildfire flooding in the Spruce Wash. The Suite of Projects will be constructed in addition to the Park Way Basins and the Killip Basins Inlet, which are funded through other sources.

On December 15, 2022, Purchasing staff solicited a Request for Statement of Qualifications for CMAR design and construction phase services. On January 13, 2023 Purchasing received Statements of Qualifications (SOQs) from the following five construction firms: Banicki Construction, Eagle Mountain Construction, Fann Contracting, Kinney Construction, and Tiffany Construction Company. A nine-member selection committee of City staff, three outside engineering consultants, and an outside contractor executive evaluated the SOQs. After the selection committee review process and negotiations, in early April 2023 the City's qualifications based selection process identified Eagle Mountain Construction as the most qualified Contractor to perform the CMAR design and construction phase services for the Suite of Projects.

**Key Considerations:**

This is the Second Amendment to add GMP 3 to the current Agreement with EMC for the Suite of Projects. GMP 3 includes the Linda Vista to Cedar Channel Project. The First Amendment adding GMP 2 included the utility relocations in the Linda Vista to Cedar Channel in addition to the Wedge Utilities, Grandview Street Improvements and Linda Vista Crossing. The remaining projects within the Suite of Projects will be presented for Council's consideration later in 2024 with a Third Amendment adding GMP 4. Please refer to the attached context and vicinity maps.

The Suite of Projects consist of the following eight Projects:

1. Grandview Drive Reconstruction -- a reconstructed inverted crown street with a modified rolled curb instead of a typical rolled curb to increase stormwater capacity of the roadway on Grandview from Linda Vista to Cedar including the side-streets, and replacing and lowering the existing aging water and sewer infrastructure to ensure proper cover with the lowered roadway.
2. The Wedge Detention Basin -- a detention basin to receive diverted flows from Spruce Wash.
3. Linda Vista Drive Crossing -- a new box culvert to increase the inlet and downstream channel capacity and reduce the potential for overtopping of Linda Vista Drive. This project also includes adding an inlet for the storm drain to the Wedge Detention Basin Project and relocating existing water and sewer mains so they are not in conflict with the new concrete box culvert.
4. Cedar Avenue to Linda Vista Drive Channel: a re-graded and hardened channel to improve capacity for stormwater runoff conveyance. The work under Amendment One, GMP #2 includes the franchise utility relocations for UniSource Energy Services and Arizona Public Service. The work under this Amendment Two, GMP #3 generally includes earthwork and installation of armor flex and concrete channel linings. ArmorFlex is a flexible, interlocking matrix of cellular concrete blocks and will be installed in the upper ~350 foot long portion of the channel, nearest Linda Vista Drive. The lower ~1,600 linear feet of channel will be a concrete trapezoidal channel.
5. Cedar Avenue Crossing: a new box culvert to increase the inlet and downstream channel capacity.
6. Arroyo Seco Drive to Dortha Avenue Channel: a re-graded and hardened channel to improve capacity for stormwater runoff conveyance.
7. Arroyo Seco Drive Inlet: a reconstructed inlet structure for the purpose of increasing the inlet capacity to capture more stormwater into the downstream existing 60-inch storm drain.
8. Killip Basins Outlet: a new outlet structure from the Killip Regional Detention Basins to an existing storm drain in Main Street to serve as a secondary outlet for larger storm events, reducing the impact of water overtopping the basins.

Design is nearing completion on the remaining Projects within the Suite and is anticipated to be completed this summer 2024. The final scheduling and construction sequencing of the Suite will be determined once designs and other funding source requirements are known.

The majority of the improvements in the Suite of Projects will be constructed within City property, in City right-of-way, and or within the existing public utility and drainage easement along Spruce Wash. This Amendment Two, GMP #3 requires an access and drainage easement from one property owner and temporary construction easements for final grading from four property owners along the channel. The concrete channel is located with an existing drainage and public utilities easement.

The Construction Manager at Risk (CMAR) method of procurement was selected to expedite the design and construction schedule and to accommodate the complex sequencing of construction activities for this large-scale complex Suite of Projects with limits in an established neighborhood, near multiple schools, on high traffic volume streets with Mountain Line bus routes, and in a wash that experiences post-wildfire flooding. The CMAR process is a collaborative effort, which allows for flexibility with delivering the design and construction of the Project, as well as an open dialog between the City, the Design Consultant, and the Contractor on critical design and construction issues to minimize impacts to the community during construction.

#### **Expanded Financial Considerations:**

The Spruce Wash Flood Mitigation Suite of Projects is funded by the November 2022 voter approved Proposition 441 Wildfire, Flood, and Wastewater Infrastructure Bond, which dedicated \$26 million towards flood mitigation projects.

GMP#1 is \$2,906,383.00 plus an Owners Contingency of \$50,000.00 for a Total Contract Price of

\$2,956,383.00. GMP#1 is for the construction of the utilities portion of the Grandview Project and the clearing portion of the Wedge Project.

GMP#2 is \$7,429,149.06 plus an approximate 2.5% Owners Contingency of \$185,000.00. GMP#2 is for the utility relocations in the Linda Vista to Cedar Channel and construction of the Wedge Utilities, Grandview Street Improvements and Linda Vista Crossing.

This GMP#3 is \$2,907,375.00 plus an approximate 2.0% Owners Contingency of \$50,000.00.

The Total Contract Price including Amendment One and this Amendment Two and owners contingency is now \$13,527,907.06.

The contract duration is 1,025 days with an anticipated completion date of June 26, 2026.

Project / Portion of Project	FY24	FY25	Budget Line	Account Number
Linda Vista to Cedar Channel	\$2,359,852	\$1,725,298	Cedar to Linda Vista Channel	410-08-385-3525-3

**Community Benefits and Considerations:**

- Mitigating post-wildfire flooding in the Spruce Wash and surrounding neighborhoods, businesses, parks, and schools.
- Replacing and or abandoning aged and undersized existing water and sewer infrastructure, ranging from 51-63 years old, to meet current standards.
- Reducing required utilities maintenance with the construction of the new infrastructure.
- Coordinating construction of multiple projects and utilizing project areas for temporary construction yards in the immediate vicinity to minimize inconveniences to the public and reduce costs.

**Community Involvement:**

Inform, Involve, Empower:

- Starting from roughly August of 2021 there have been over 19 Museum Flood and Post Wildfire Flooding Council Updates which will continue through and after the design and construction of the Suite of Projects.
- In January 2022, Beta PR, on behalf of the City of Flagstaff, created the Museum Fire Flood Projects Website [museumfloodprojects.com](http://museumfloodprojects.com). As of May 31, 2024, 5,615 individuals have visited site with over 6,930 total visits. The site also includes a subpage where people can sign up to receive E-Newsletters sent out via email on a weekly basis to provide updates and information on the Museum Fire Flood Mitigation Projects.
- In February 2022, Beta PR, on behalf of the City of Flagstaff, began sending out the ENewsletters and will continue to do so through and after the completion of the Suite of Projects. As of May 31, 2024, there are currently 550 ENewsletter subscribers.
- Beta PR created and maintains a Museum Fire Flood Projects email address ([info@museumfloodprojects.com](mailto:info@museumfloodprojects.com)) and a project hotline. To date, over 95 stakeholders have utilized the the hotline to get their questions and concerns answered.
- In February 2022, Beta PR, on behalf of the City of Flagstaff, sent out an introduction mailer for Museum Fire Flood Mitigation Projects that was mailed to 950 properties in Spruce Wash area that included a Spanish translated side. Since February 2022, BetaPr, on behalf of the City, has mailed seven notification fliers and placed five door hangers to spread project information.
- In November 2022, voters approved Proposition 441 with support from 76% of Flagstaff voters.
- In December 2022, the Proposition 441 subpage of the Museum Fire Flood Projects Website was created which includes more information regarding the Suite of Projects.
- On February 2, 2023, the City hosted a Spruce Wash Community Meeting to provide information on the history of the Museum Fire, update on the progress of Spruce Wash Watershed restoration, November Prop 441 passage, and Prop 441 preliminary projects.
- On May 15, 2023, the City hosted the second Spruce Wash Community Meeting to provide information on the 2023 monsoon forecast, a Suite of Projects update, Coconino County Flood Control District Update, and preparing for the 2023 monsoon season.



# Spruce Wash

Amendment Two to the CMAR  
Construction Services Agreement

July 2, 2024



# Suite of Projects



## Key Flood Projects

1. Grandview Drive Reconstruction
2. "The Wedge" Detention Basin
3. Linda Vista Drive Crossing
4. Cedar Avenue to Linda Vista Drive Channel
5. Cedar Avenue Crossing
6. Arroyo Seco Drive to Dortha Avenue Channel
7. Arroyo Seco Drive Inlet
8. Killip Basins Outlet
9. Killip Basins Inlet
10. Park Way Basins

## Completed Key Flood Projects

-  Spruce Wash Channel Improvements Project (Cedar Avenue to Dortha Avenue)
-  Spruce Wash Channel Improvements Project (Dortha Avenue Inlet)
-  Killip School Regional Detention Basins Project

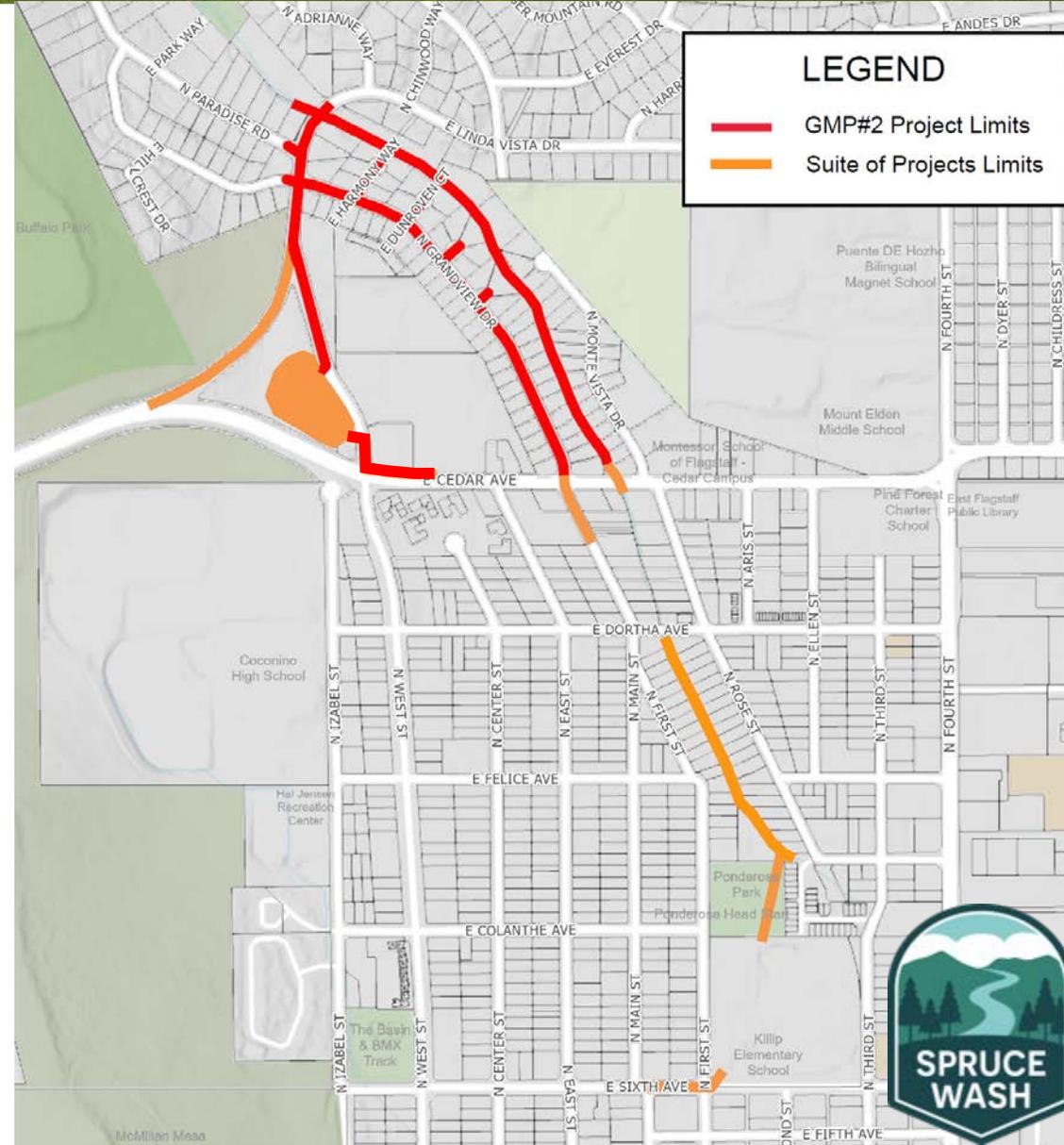




# Amendment One – Project Status



- Grandview
  - Roadway Portion
- Linda Vista Crossing
- Linda Vista to Cedar Channel
  - Franchise Utility Portion
- The Wedge
  - Utilities Portion
- Property Acquisition





# Amendment Two



- GMP #3 with Eagle Mountain Construction:
  - Linda Vista to Cedar Channel





# Amendment Two & Cost Summary

GMP 1	\$2,906,383.00
GMP 1 Owner's Contingency	\$50,000.00
GMP 2	\$7,429,149.06
GMP 2 Owner's Contingency	\$185,000.00
GMP 3	<b>\$2,907,375.00</b>
GMP 3 Owner's Contingency	<b>\$50,000.00</b>
<b>TOTAL</b>	<b>\$13,527,907.06</b>

**AMEND. TWO**

- Contract Duration: 1,025-calendar days





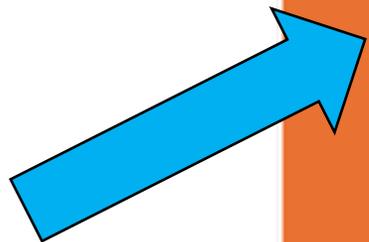
# Schedule



NOV 2022  
PROP 441  
PASSES  
  
THANK YOU  
FLAGSTAFF!

NOV 2022 -  
ONGOING  
STUDY,  
PLANNING,  
DESIGN &  
PRECON

APR 2024  
COMPLETED:  
GRANDVIEW  
UTILITIES &  
WEDGE  
CLEARING



2024 CONSTRUCT:  
Grandview  
LV-Cedar  
Channel  
  
Wedge Utils &  
Stormdrain

2025 CONSTRUCT:  
Wedge Utils &  
Stormdrain  
Cont.  
  
Cedar Xing  
  
Dortha-Arroyo  
Seco Channel

2026 CONSTRUCT:  
Arroyo Seco  
to Dortha  
Channel  
Cont.  
  
Killip Inlet &  
Outlet





# Community Involvement

- 19 Council / Community Meetings
- 17 project notices distributed
- Weekly E-newsletters
- Website: [museumfloodprojects.com](http://museumfloodprojects.com)
- Email: [info@museumfloodprojects.com](mailto:info@museumfloodprojects.com)
- Project Hotline: (928) 255-5123
- Beta PR
- Eagle Mountain Construction



# Questions?





## SECOND AMENDMENT

### Spruce Wash Drainage Improvements Projects Construction Manager at Risk

#### Construction Phase Services Agreement Phase 2 - GMP 3

**Project No. #03-23014  
Agreement No. 2023-60**

This Second Amendment (“Second Amendment”) to the fully executed Construction Phase Services Phase 1 - Agreement No. 2023-60 dated July 14, 2023 (the “Agreement”) for the City of Flagstaff Spruce Wash Drainage Improvement Projects (the “Projects”) is made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2024, by and between the City of Flagstaff, an Arizona municipal corporation (“City”), and Eagle Mountain Construction, Inc., an Arizona corporation (“Construction Manager at Risk” or “CMAR”).

The Parties to the Agreement, hereby agree to the following Second Amendment:

- A. Pursuant to Article 5 – Contract Price, Section 5.2, Exhibit B – is amended to include GMP 3 – Cover Letter and Contract Summary, dated May 7, 2024, 2 pages (attached hereto).
- B. CMAR’s GMP 3 is for the roadway improvements for channel grading and armoring for Linda Vista-Cedar Channel (Phase 2) portion of work of the Project and shall total **two million, nine hundred seven thousand, three hundred seventy-five dollars and zero cents (\$2,907,375.00)** plus and approximately 2% Owners Contingency of **fifty thousand dollars and zero cents (\$50,000.00)** which combined equals the total Second Amendment amount of **two million, nine hundred fifty-seven thousand, three hundred seventy-five dollars and zero cents (\$2,957,375.00)**.
- C. The total Contract Price for the complete performance of work under the Agreement, as amended by this Second Amendment, shall be **thirteen million, five hundred twenty-seven thousand, nine hundred seven dollars and six cents (\$13,527,907.06)**.
- D. All other provisions of the Agreement shall remain unchanged in full force and effect.

***(Signatures on Following Page)***

IN WITNESS WHEREOF, the Parties have caused this Second Amendment to be executed by their duly authorized representatives as of the date first written above. This Second Amendment will be in full force and effect only when it has been approved and executed by the duly authorized City officials.

**City of Flagstaff**

**Eagle Mountain Construction, Inc.**

By: \_\_\_\_\_  
Greg Clifton, City Manager

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest:

\_\_\_\_\_  
City Clerk

Approved as to form:

\_\_\_\_\_  
City Attorney



May 7, 2024

Trevor Henry  
Capital Improvements Engineer  
City of Flagstaff  
211 W. Aspen Ave.  
Flagstaff, AZ 86004

Re: Spruce Wash Watershed Improvements (“Project”)  
City of Flagstaff Project # 03-23014  
Construction Manager at Risk – Guaranteed Maximum Price (“GMP”) 3

Dear Mr. Henry,

Eagle Mountain Construction (“EMC”) is submitting GMP 3 for the above referenced Project.

The Spruce Wash Watershed Improvements is a “suite” of 8-9 individual projects (pending final designs) along the Spruce Wash drainage corridor, with several of the scopes having multiple phases. This GMP 3 includes Phase 2 of the Linda Vista to Cedar Channel; consisting generally of channel grading and armoring per JE Fuller’s plans sealed 4-1-24.

As the remaining suite of projects progress through the design phase, EMC will continue with our Design Phase services, offering constructability reviews, cost and schedule modeling, TAC Meeting attendance, and subsequent GMP development. EMC’s services for the balance of the Design Phase are reflected in the General Conditions for each project still in the design phase.

This scope is tentatively scheduled to begin after the Phase 1 Unisource gas main & services relocations are completed, which is again tentatively scheduled for mid-late fall.

We continue to be honored to be apart this Team and appreciate the opportunity to work with so many of the Project stakeholders, the team of engineers, and the City of Flagstaff staff in the execution of the ever changing and challenging Project.

Sincerely,

Eagle Mountain Construction

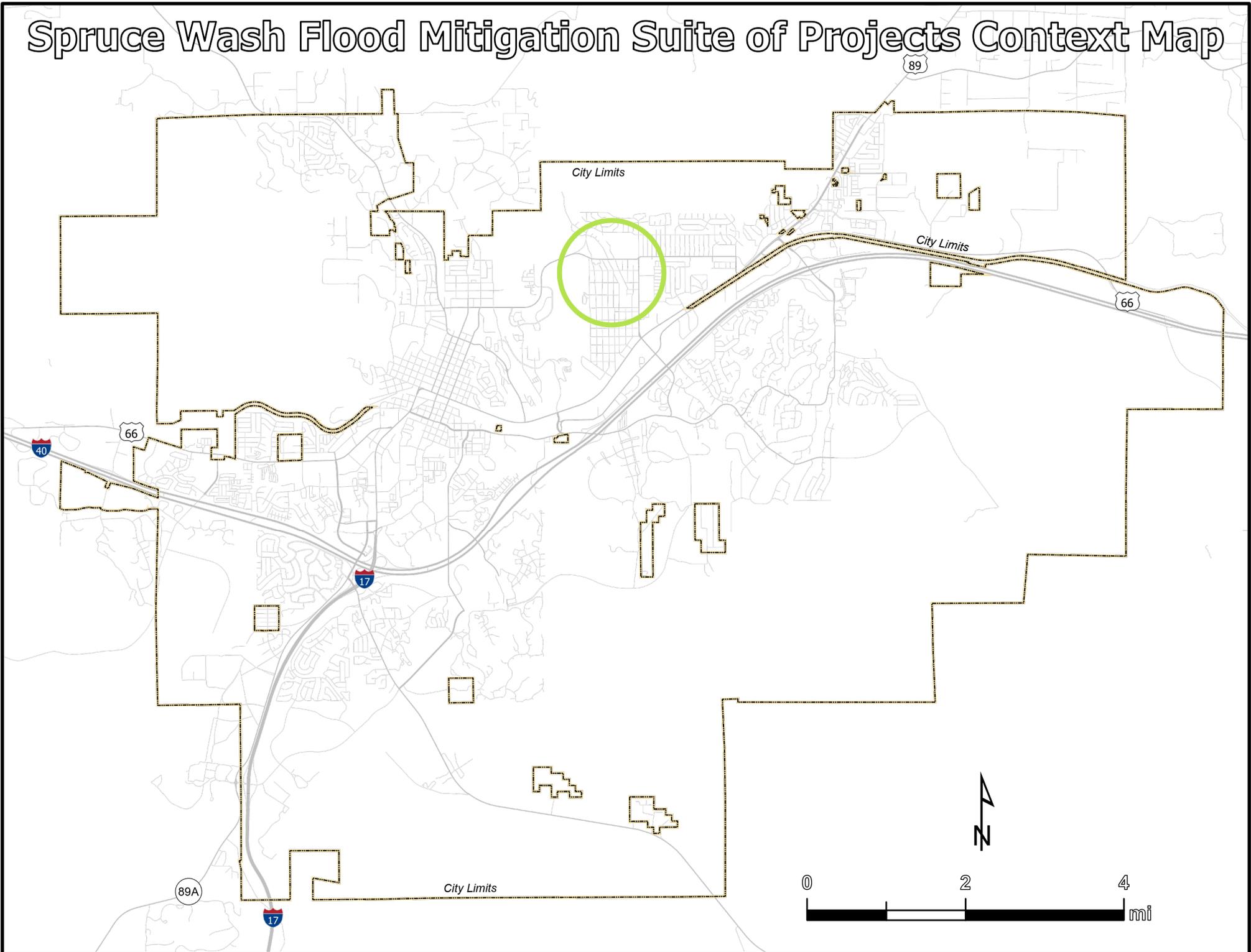
**Marco Spagnuolo**  
CEO

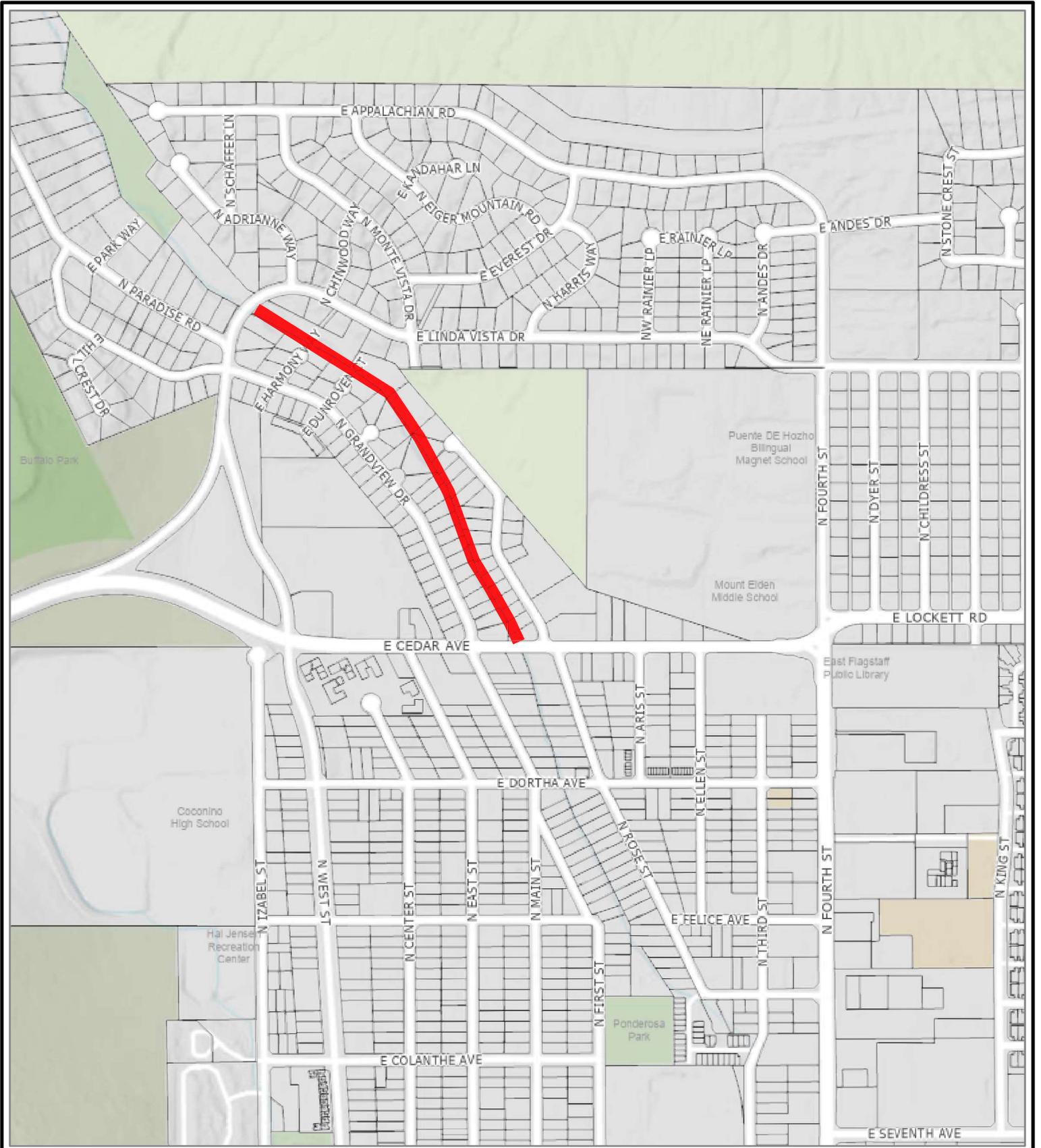
**LINDA VISTA - CEDAR CHANNEL**

**PHASE 2**

Keynote	DESCRIPTION	QTY	Unit	Unit Cost	Total
<b>SITE REMOVALS</b>					
109	REMOVE & REPLACE EXISTING CHAIN LINK FENCE	170	LF	\$ 90.00	\$ 15,300.00
110	REMOVE & REPLACE EXISTING WOOD FENCE	1	LS	\$ 4,645.00	\$ 4,645.00
112	REMOVE & RELOCATE EXISTING DRY ROCK RETAINING WALL	1	LS	\$ 5,200.00	\$ 5,200.00
116	REMOVE & SALVAGE EXISTING RIPRAP	105	SY	\$ 15.00	\$ 1,575.00
117	SAW-CUT, REMOVE & DISPOSE EXT STORM DRAIN	5	LF	\$ 65.00	\$ 325.00
<b>EARTHWORK CONSTRUCTION</b>					
	EARTHWORK (CUT & FILL)	1	LS	\$ 194,330.00	\$ 194,330.00
<b>DRAINAGE CONSTRUCTION</b>					
204	NEW 4" COMPACTED AB	360	SF	\$ 16.00	\$ 5,760.00
502	NEW CONTECH ARMORFLEX CLASS 40 BLOCK	13,700	SF	\$ 35.00	\$ 479,500.00
503	NEW SHOTCRETE CHANNEL	40,980	SF	\$ 30.00	\$ 1,229,400.00
505	NEW CONCRETE SPILLWAY	1	EA	\$ 9,620.00	\$ 9,620.00
507&514	NEW END SECTION	2	EA	\$ 1,750.00	\$ 3,500.00
512	NEW MATERIAL CONNECTION	1	EA	\$ 4,190.00	\$ 4,190.00
513	WRAP POWER POLE WITH 1/2" ASPHALT EXPANSION JOINT - excluded, APS to perform	NA			
<b>MISCELLANEOUS</b>					
	MOBILIZATION & DEMOBILIZATION	1	LS	\$ 55,420.00	\$ 55,420.00
	SURVEY & STAKING	1	LS	\$ 22,560.00	\$ 22,560.00
	TRAFFIC CONTROL & MAINTENANCE	1	LS	\$ 19,950.00	\$ 19,950.00
	AS-BUILTS\RECORD DWGS	1	LS	\$ 5,160.00	\$ 5,160.00
	SWPPP INSTALLATION & MAINTENANCE	1	LS	\$ 36,930.00	\$ 36,930.00
<b>CONTRACT ALLOWANCES</b>					
	SAND BAG REMOVAL	1	LS	\$ 22,200.00	\$ 22,200.00
	ROCK EXCAVATION	250	CY	\$ 200.00	\$ 50,000.00
	INTERIM CONDITION FOR SHOTCRETE TO CEDAR CROSSING TRANSITION	1	LS	\$ 5,000.00	\$ 5,000.00
<b>SUMMARY</b>					
<b>COST OF WORK</b>					<b>\$ 2,170,565.00</b>
	GENERAL CONDITIONS (GC'S) (Percent of Cost of the Work)	9.35%			\$ 203,000.00
<b>SUBTOTAL #1 - Cost of the Work + GC's</b>					<b>\$ 2,373,565.00</b>
	CONSTRUCTION FEE (Fee) (Percentage of Subtotal #1)	10.50%			\$ 249,224.33
<b>SUBTOTAL #2 - Cost of the Work + GC's + Fee</b>					<b>\$ 2,622,789.33</b>
	PERFORMANCE & PAYMENT BOND (Percentage of Subtotal #2)	0.90%			\$ 23,605.10
<b>SUBTOTAL #3 - Cost of the Work + GC's + Fee + Bonds</b>					<b>\$ 2,646,394.43</b>
	INSURANCE (Percentage of Subtotal #3)	1.00%			\$ 26,463.94
<b>SUBTOTAL #4 - Cost of the Work + GC's + Fee + Bonds + Insurance</b>					<b>\$ 2,672,858.37</b>
	SALES TAX (Percentage of GMP)	5.97%			\$ 159,516.63
	CMAR CONTINGENCY & PRICE ESCALATION FUNDING	3%			\$ 75,000.00
<b>GMP</b>					<b>\$ 2,907,375.00</b>
	OWNERS CONTINGENCY (Percentage of Cost of the Work)	2%			\$ 50,000.00
<b>CONTRACT PRICE</b>					<b>\$2,957,375.00</b>

# Spruce Wash Flood Mitigation Suite of Projects Context Map





# Vicinity Map GMP #3

## Spruce Wash Suite of Projects



City of Flagstaff maps and data are updated on a regular basis from data obtained from various sources. The City of Flagstaff endeavors to provide accurate information, but accuracy is not guaranteed. You are strongly encouraged to obtain any information you need for a business or legal transaction from a surveyor, engineer, title company, or other licensed professional as appropriate. Information is provided subject to the express condition that you knowingly waive any and all claims for damages against the City of Flagstaff relating to use of this information.

6/12/2024 3:19 PM



# CITY OF FLAGSTAFF CONTRACT SUPPLEMENTARY JUSTIFICATION Design-Build OR CMAR Contracts

PROJECT NO. WS3525 PROJECT NAME: Spruce Wash – Cedar to Linda Vista Channel

FILE NO. 03-23012 Project Manager: Trevor Henry

CONTRACTOR/CONSULTANT: Eagle Mountain Construction (EMC)

**PROJECT DESCRIPTION:**

This project includes construction of a hardened channel in Spruce Wash between Cedar Avenue and Linda Vista Drive. This work is funded by Proposition 441 and is a portion of the Spruce Wash Flood Mitigation Suite of Projects.

**JUSTIFICATION FOR USE AND AMOUNT:**

**Contractor’s Contingency Justification and Amount:**

Contractors Contingency of **\$75,000.00** was negotiated and was recognized to be necessary to compensate Eagle Mountain Construction for increases in material costs which could not be determined at the time of contracting.

**Owner’s Contingency Justification and Amount:**

Owner’s Contingency of **\$50,000.00** was recognized to be necessary to compensate EMC should there be unidentified services needed, unsuitable native material discovered, scope changes, and/or differing site conditions. The **\$50,000.00** Owner’s Contingency is roughly 2.0% of the \$ **2,907,375.00** Guaranteed Maximum Price #3 proposed by EMC to complete the work, which combined equals the Contract Price of **\$2,957,375.00**. If this Project were utilizing traditional project delivery methods, this amount would be within the allowable limits for a Contract Allowance per the Procurement Code revisions approved by Council on April 16, 2019.

**COST/BUDGET/FUNDING SOURCE ANALYSIS:**

**Contractor’s & Owner’s Contingency:**

Contractor’s and Owner’s Contingencies are recommended to be in the Total Contract Price and can be funded by Account Number **410-08-385-3525-3** in FY25.

APPROVAL:	Signature	Date:
Project Manager		Approval Recommended <u>06/13/2024</u>
Program Manager	<i>Trevor Henry</i>	Approval Recommended <u>6/13/24</u>
Section Head	N/A	Approval Recommended <u>06/13/2024</u>
Division Head		Approval Recommended _____

## Definitions

### **Owner's Contingency (Design/Build or Construction Manager at Risk)**

"Owner's Contingency" means a fund to cover cost growth during the Project used at the discretion of the City usually for costs that result from City's directed changes or Differing Site Conditions, or as the City may otherwise elect. The amount of the Owner's Contingency will be set solely by the City and will be in addition to the Project costs included in the Design-Builder's GMP packages.

The Owner's Contingency are funds to be used at the sole discretion of the City to cover any increases in Project costs that result from City directed changes, Differing Site Conditions, or as the City may otherwise elect. Owner's Contingency will be added to the GMP amount provided by the Design-Builder/CMAR, the sum of which will be the full Contract Price for construction. Markups for Construction Fee and taxes will be applied by the Design-Builder at the time that Owner's Contingency is used

### **Contractor's Contingency (Design/Build or Construction Manager at Risk)**

"Design-Builder's/CMAR Contingency" means a fund to cover cost growth during the Project used at the discretion of the Design-Builder/CMAR, usually for costs that result from Project circumstances. The amount of the Design-Builder's/CMAR Contingency will be negotiated as a separate line item in each GMP package.

Use and management of the Design-Builder's/CMAR Contingency:

Design-Builder's/CMAR Contingency is an amount the Design-Builder/CMAR may use under the following conditions: (1) at its discretion for increases in the Cost of the Work, or (2) with written approval of the City for increases in General Condition Costs. Design-Builder/CMAR Contingency is assumed to be a direct Project cost so will receive all markups at the time of GMP submission.

When the Design-Builder/CMAR utilizes Design-Builder's/CMAR Contingency funds, the Design-Builder/CMAR shall make the appropriate changes to the Schedule of Values with the next regular progress Payment Request. The Design-Builder/CMAR shall deduct the amount of Design-Builder's/CMAR Contingency funds used from the Design-Builder's/CMAR Contingency line item and add the same amount to the line item on the Schedule of Values where the funds were used. If the Design-Builder's/CMAR Contingency funds are used for a new line item that was not given with the original Schedule of Values, that will be so indicated.

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Trevor Henry, Capital Improvements Engineer  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



---

**TITLE:**

**Consideration and Approval of Contract:** Approve Change Order No. 18 with Shephard Wesnitzer, Inc. in the amount of \$214,480.00 and a 365 calendar day time extension for the Rio de Flag Flood Control Utility Relocation Design Services Contract.

**STAFF RECOMMENDED ACTION:**

1. Approve Change Order No. 18 with Shephard Wesnitzer, Inc. the amount of \$214,480.00 and a 365 calendar day time extension for the Rio de Flag Flood Control Utility Relocation Design Services Contract; and
2. Authorize the City Manager to execute the necessary documents.

**Executive Summary:**

Approval of Change Order No. 18 will compensate Shephard Wesnitzer, Inc. (SWI) for assisting the City in acquiring the property rights necessary for the U.S. Army Corps of Engineers (USACE) to certify the real estate for construction based on the needed lands, easements, rights-of-way, relocations, and disposal site (LERRD) and complete design for the Rio de Flag Flood Control Project (Project). The additional tasks of Change Order No. 18 include master easement tracking, additional legal descriptions, Utility compensability letters, BNSF utility accommodation policy services, USACE comment resolution, Five Points Construction, Architect/Engineering Quality Control Plan, Signal plans, Wastewater updates and meetings/coordination. There is a 365 calendar day time extension requested with Change Order No. 18 to ensure the estate necessary meets the guidelines and requirements as outlined by the USACE.

The Change Order Committee considered this item on June 13, 2024, it was approved with a recommendation to forward to the Council for final approval at the City Council meeting on July 2, 2024.

**Financial Impact:**

The FY 2004-2005 original Design Services Contract was approved by City Council to SWI in the amount of \$1,582,521.00. Subsequent values of prior changes authorized through the City Manager's Change Order Authority and City Council approval has resulted in an amount of \$2,397,431.34. The funding to pay the amount of Change Order No. 18 (\$214,480.00) will come from the Stormwater Fund, tracked in the Rio de Flag project account #206-08-385-3236-0-4421.

The Rio de Flag project has \$1,151,354 budgeted in FY24, \$20,851,032 appropriated in FY25 and \$1,290,000 appropriated in FY26.

Original Contract Value	\$1,582,521.00
Value of Prior Changes	\$2,397,431.34
Value of this Change	<u>\$ 214,480.00</u>
New Contract Value	\$4,194,432.34

**Policy Impact:**

No Impact

**Previous Council Decision or Community Discussion:**

Previous City Council actions pertaining to authorized value changes and action items necessary for the continuation of the Project since FY 2004-2005.

**Options and Alternatives to Recommended Action:**

1. Approve Change Order No. 18 with SWI the amount of \$214,480.00 and a 365 calendar day time extension as recommended; or
2. Reject Change Order No. 18, which will forfeit the opportunity for the City to comply with its requirement to provide the estate necessary to allow the USACE to certify the real estate for the Rio de Flag Flood Control Project.

**Background and History:**

On January 18, 2005, the City Council awarded the Design Services Contract to SWI to perform design services for this Project.

**Key Considerations:**

The Rio de Flag Flood Control Project is included in the City's Stormwater Management Capital Improvement Program and is the number one priority. The Project has also been the subject of numerous City Council meetings, City-to-Citizen communications and newspaper articles.

The USACE requested funding for their FY 20 work plan to construct the entire Project. The USACE received \$52M which will complete their share (65%) of the project as outlined in the Project Cooperation Agreement.

In 2018, the City Council authorized a fee increase to the Stormwater rate that would provide funding for the Capital Improvement Program (CIP). In 2019, City Council authorized collection of the rate increase. The rate increase will provide funding for the Stormwater CIP, of which the Rio de Flag Flood Control Project is the number one priority. The City has the capacity and commitment to complete our share of the project as outline in the Project Cooperation Agreement.

On April 12, 2021, the USACE submitted to the City the real estate "take letter" outlining the estate necessary for the real estate certification. It is the City's responsibility as outlined in the Project Cooperation Agreement to provide the corridor necessary for the USACE to solicit, award and construct the Project.

A sample of the additional tasks contained in Change Order No. 18 includes:

**Master Easement Tracking Spreadsheet:**

- Ardurra prepared a master easement tracking spreadsheet with every parcel impacted by the project. Each parcel includes the APN, owner, site address, mailing address, type of easement being acquired (Channel Easement, Temporary Work Area Easement, Drainage Easement, Waterline Easement, Sewer line Easement, Etc.), utility conflicts, ongoing tasks, when the legal description was updated and completed, and additional notes for the easements.

**Stage 1 Legal Descriptions:**

- Ardurra prepared 14 additional easements for Stage 1 for the Mikes Pike traffic phasing plan, Mikes Pike, and the Flagtown parcels. The legal descriptions are complete and submitted to the City of Flagstaff.

**Phase 2 Legal Descriptions:**

- This item includes Segment Map revisions already completed based on USACE comments on the previously prepared segment map. Item also includes up to 25 Public Utility Easements (PUE's), updates to 80 TWAE and Channel Easement legal descriptions already completed (need to be reviewed and

updated once segment map is approved), up to 45 aerial easement exhibits, and staking up to 80 parcels for property owners to see the limits of proposed easements.

#### Utility Compensability:

- Item includes up to 10 Utility Compensability letters/exhibits. The Utility Compensability deliverable is assumed to be the same as what was submitted to the USACE for Stage 1.

#### BNSF UAP Applications:

- Complete BNSF UAP forms and prepare supporting exhibits. Ardurra has already created 19 UAP applications that are ready to submit under Change Order #16. This item includes 24 additional applications.

#### ATR Comment Resolution:

- Item includes addressing City of Flagstaff and USACE ATR comments on the Street Reconstruction and Utility Relocation Plans for both Stages 1 and 2. Plans will be updated and submitted to the City and USACE as part of the Backcheck submittal process. Item includes comment resolution meetings with City staff, coordination with Tetra Tech, and updates to the project specifications.

#### Five Points Construction Plans:

##### Eastbound Right Turn Lane

- An Eastbound right turn lane on Clay Avenue at the Milton intersection is required to address and ATR comment. The right turn lane will be added to the Stage 1 Surface Replacement construction plans.

##### 30" Waterline Realignment

- The ATR submittal included a 30% water line vertical realignment in the Five Points Intersection. During constructability review, it was determined that the vertical realignment could not be accomplished without closing the entire intersection. An alternate realignment route was identified through APN 103-06-003B that can be constructed without closing the intersection. The Utility Relocation Plans will be updated to reflect the new realignment.

##### 100% Phasing Plans

- 60% construction plans for the Five Points Intersection were completed under Change Order #17. Ardurra prepared and submitted several different traffic phasing plans, including one lane and two lane options, to ADOT before a phasing plan was agreed upon. This item includes addressing ADOT comments and completing 100% construction plans for the traffic phasing plan.

##### Traffic Control Plans

- Traffic control plans will be completed and submitted to the City and ADOT for both phases of the Five Points construction. Draft TCP's have already been submitted and reviewed, and Ardurra is currently updating the TCP's for final submittal.

#### Architect-Engineer (A-C) QC Plan:

SWI/Ardurra will prepare a Specific Quality Control Plan using the Hansen Dam Recreation Area Project example provided by the Corps. The document will be revised to be project specific to the Utility Relocation and Surface Replacement plans prepared by SWI/Ardurra. Additionally, a project team from another Ardurra office that has not worked on the RDF project will review the ATR sets of plans for QA/QC.

#### Meetings & Coordination:

- This item includes the following meetings for an additional 12 months with two SWI/Ardurra staff:

- Weekly meetings with the City of Flagstaff

- Bi-weekly meetings with the City of Flagstaff, Corps, and Tetra Tech

- Monthly coordination meetings to coordinate the Lone Tree Overpass and RDF projects.

- Monthly coordination meetings with BNSF to coordinate all City projects along the BNSF corridor.

#### Signal Plans (Lee Engineering):

- Lee Engineering will update the previously prepared traffic signal plans for the Five Points intersection to incorporate the newly added eastbound right turn lane on Clay Avenue.

#### Siphon Plan Updates:

- Water Works will update the previously prepared Siphon construction plans to relocate the vent pipe and update CAD backgrounds as part of the ATR review process.

#### Landscape Plans:

- Norris will update the landscape plans to address revisions to address ATR comments. Revisions include landscape plans and details, irrigation plans and details, form liner design and concept drawings, and nine (9) additional meetings. The total change order from Norris is \$12,600. Task 3 in CO #13 (\$7,700) will be used to help offset this change order task.

Change Order No. 18 will add 365 calendar days to the Design Services Contract. The revised completion date is October 1, 2025.

Change Order No. 18 was presented to the Change Order Committee for their consideration on June 13, 2024. The item was approved with a recommendation to forward to the City Council for consideration and final approval.

#### Expanded Financial Considerations:

Funding for Change Order No. 18 (\$214,00) will come from the Stormwater Fund and will be tracked in the Rio de Flag Flood Control project 206-08-385-3236-0-4421. The Stormwater Fee rate increase started collection in July 2019 to fund the Stormwater CIP. The Rio de Flag Flood Control Project is part of the Stormwater CIP and is the highest priority Project.

The Rio de Flag project has \$604,000 budgeted in FY24, \$24,275,415 appropriated in FY25 and \$1,371,650 appropriated in FY26.

The USACE was awarded \$52M in their FY 20 work plan, providing commitment for their full share of the project at 65%.

#### Expanded Options and Alternatives:

1. Approve Change Order No. 18 with SWI in the amount of \$214,480.00 and a 365 calendar day time extension as recommended; or
2. Reject Change Order No. 18, which will forfeit the opportunity for the City to comply with its requirement to provide the estate necessary to allow the USACE to certify the real estate for the Rio de Flag Flood Control Project.

#### Connection to PBB Priorities and Objectives:

- Deliver outstanding services to residents through a healthy, well maintained infrastructure system.
- Strengthen Flagstaff's resilience to climate change impacts on built, natural, economic, health, & social systems.



# City of Flagstaff

Rio de Flag Flood Control Project

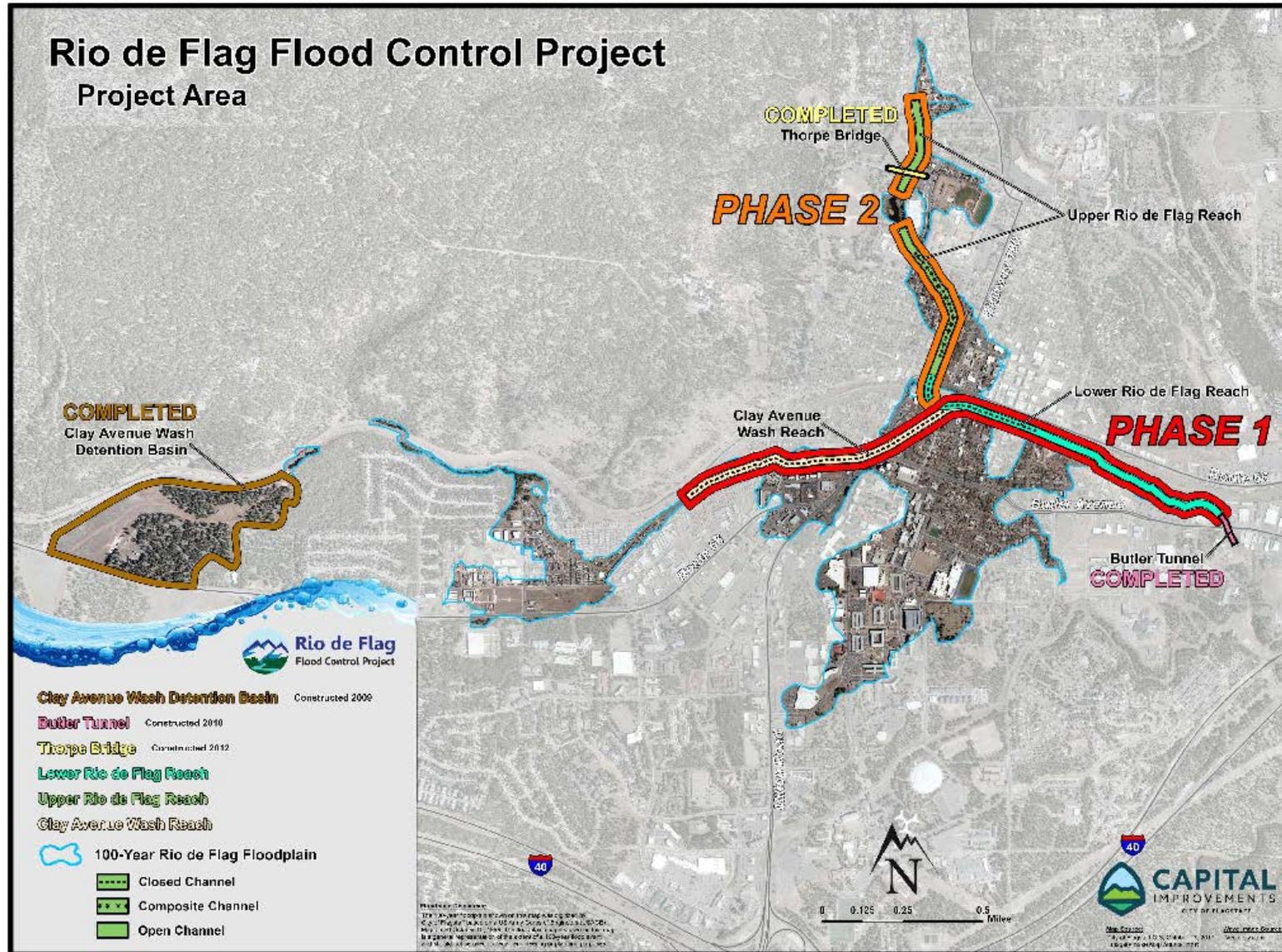
Change Order No. 18

July 2, 2024





# CHANGE ORDER NO. 18





# CHANGE ORDER NO. 18



## Rio de Flag Flood Control Project

- Lead Agency: U.S. Army Corps of Engineers
- Project Cooperation Agreement - 2004
- Engineer: Tetra Tech and Ardurra - SWI
- Construction Bid: Winter 2024
- Budget: \$122M (Phase 1 & 2)
  - City 35%
- Construction: Spring 2025 to Spring 2030
- LERRDS (land, easements, ROW, removals, disposals)





# CHANGE ORDER NO. 18



## History of Design Services with Shephard Wesnitzer, Inc.

- Original Design Services Contract, **2005**
- Contract Modifications, **2005 to 2009**
  - No Council Action, City Manager's CO Authority and Staff's CA Authority
- Change Order No. 4, **2009**
- Additional Contract Modifications, **2009 to 2020**
  - No Council Action, City Manager's CO Authority and Staff's CA Authority
- Change Orders No. 13-17, **March 2020- April 2024**



# CHANGE ORDER NO. 18



## History of Design Services with Shephard Wesnitzer, Inc.

- July 2, 2024, Council consideration of Change Order No. 18
  - **Change Order No. 18** – added tasks, master easement tracking, additional legal descriptions, Utility compensability letters, BNSF utility accommodation policy services, USACE comment resolution, Five Points Construction, Architect/Engineering Quality Control Plan, Signal plans, Wastewater updates and meetings/coordination
    - **\$214,480 with 365 days**
  - City is responsible for acquiring the property rights.
  - Real Estate Certification for Army Corps of Engineers – LERRDS
  - Stormwater Fee will fund CO #18



# CHANGE ORDER NO. 18



## History of Design Services with Shephard Wesnitzer, Inc.

- **Change Order No. 18:**

- On June 13, 2024, the Change Order Committee reviewed and approved with a recommendation to be forwarded to the Council for final approval

- **Staff Recommended Action:**

1. Approve Change Order No. 18 with Ardurra - Shephard Wesnitzer, Inc. in the amount of \$214,480.00.
2. Add 365 calendar days to the design services contract
3. Authorize the City Manager to execute the necessary documents.



# CHANGE ORDER NO. 18



**Questions?**

# Rio de Flag Flood Control Project

## Project Area

**COMPLETED**  
Clay Avenue Wash  
Detention Basin

**COMPLETED**  
Thorpe Bridge

Upper Rio de Flag Reach

Lower Rio de Flag Reach

Clay Avenue Wash Reach

Butler Tunnel  
**COMPLETED**



**Clay Avenue Wash Detention Basin** Constructed 2009

**Butler Tunnel** Constructed 2010

**Thorpe Bridge** Constructed 2012

**Lower Rio de Flag Reach**

**Upper Rio de Flag Reach**

**Clay Avenue Wash Reach**

100-Year Rio de Flag Floodplain

Closed Channel

Composite Channel

Open Channel

**VICINITY MAP**

Disclaimer:  
The 100-year floodplain shown on this map was derived by City of Flagstaff based on a US Army Corps of Engineers (USACE) Map dated October 15, 1999. The floodplain shape shown on this map is a general representation of the extent of a 100-year flood event and should not be used for legal, engineering or planning purposes.



Map Scale: City of Flagstaff GIS, October 17, 2017  
Map Source: Esri  
Image Source: Webmap.com



# CITY OF FLAGSTAFF

- CONFIRMING CHANGE ORDER NO. \_\_\_\_\_
- DESIGN CONTRACT CHANGE ORDER NO. \_\_\_\_\_
- CONSTRUCTION CONTRACT CHANGE ORDER NO. \_\_\_\_\_
- CONTRACT ALLOWANCE UPDATE NO. \_\_\_\_\_

PROJECT NO. \_\_\_\_\_ PROJECT NAME: \_\_\_\_\_

FILE NO. \_\_\_\_\_ PROJECT MANAGER: \_\_\_\_\_

FIRM NAME: \_\_\_\_\_

Purchase Order Number:	Line Number:	Amount
------------------------	--------------	--------

Change Order originated by:  CITY OF FLAGSTAFF       CONTRACTOR       DESIGN FIRM       OTHER: \_\_\_\_\_

**DETAILED DESCRIPTION:**

**JUSTIFICATION:**

**TIME ANALYSIS:**

**COST ANALYSIS:**

<b>CITY OF FLAGSTAFF</b>		<b>PROJECT STATUS FORM</b>		
PROJECT NAME:		<input type="checkbox"/> Design <input type="checkbox"/> Construction <input type="checkbox"/> Other		
PROJECT NO.		FILE NO.		
ACCT. NO. _____		%		
ACCT. NO. _____		%		
COUNCIL APPROVAL DATE:		ORIGINAL CONTRACT AMOUNT:		
PROJECT BUDGET ( FY_____ )		PROJECT BUDGET ( FY_____ )		
NOTICE TO PROCEED DATE:		ORIGINAL CONTRACT PERIOD (calendar days):		
ORIGINAL COMPLETION DATE:		ORIGINAL CONTRACT ALLOWANCE:		
<b>DESIGN FIRM:</b>				
Change Orders	C.O. Amount	C.O. Days	Start Date	REASON FOR CHANGE
Revision Date	New Total	New Total	New Comp. Date	
CO #18				
2				
3				
4				
5				

**COMMENTS:** The allocations shown above are inclusive of all Change Orders shown. If there are more than 5 Change Orders, please request a separate form from Purchasing that includes additional spaces. Thank you!

	END DATES				
ORIGINAL CONTRACT PERIOD	_____ Days	( _____ )	ORIGINAL CONTRACT	\$	_____
PRIOR TIME CHANGES	_____ Days	( _____ )	TOTAL PRIOR VALUE CHANGES	\$	_____
THIS TIME CHANGE	_____ Days	( _____ )	VALUE OF THIS CHANGE	\$	_____
NEW CONTRACT PERIOD	_____ Days	( _____ )	NEW CONTRACT	\$	_____



# CITY OF FLAGSTAFF

- CONFIRMING CHANGE ORDER NO. \_\_\_\_\_
- DESIGN CONTRACT CHANGE ORDER NO. \_\_\_\_\_
- CONSTRUCTION CONTRACT CHANGE ORDER NO. \_\_\_\_\_
- CONTRACT ALLOWANCE UPDATE NO. \_\_\_\_\_

PROJECT NO. \_\_\_\_\_ PROJECT NAME: \_\_\_\_\_

FILE NO. \_\_\_\_\_ PROJECT MANAGER: \_\_\_\_\_

## SIGNATURES

### SUBMITTER

Project Manager \_\_\_\_\_ Date \_\_\_\_\_ Approved Signature 

Department Head \_\_\_\_\_ Date \_\_\_\_\_ Approved Signature \_\_\_\_\_

### COMMITTEE

Water Services \_\_\_\_\_ Date \_\_\_\_\_ Approved Signature \_\_\_\_\_

Public Works \_\_\_\_\_ Date \_\_\_\_\_ Approved Signature \_\_\_\_\_

City Engineering \_\_\_\_\_ Date \_\_\_\_\_ Approved Signature \_\_\_\_\_

City Attorney \_\_\_\_\_ Date \_\_\_\_\_ Approved Signature \_\_\_\_\_

Finance \_\_\_\_\_ Date \_\_\_\_\_ Approved Signature \_\_\_\_\_

Purchasing (Chair) \_\_\_\_\_ Date \_\_\_\_\_ Approved Signature \_\_\_\_\_

### EXECUTIVE

City Manager \_\_\_\_\_ Date \_\_\_\_\_ Approved Signature \_\_\_\_\_

Council Meeting Date (if required) \_\_\_\_\_ Council Approved? Yes\_\_\_ No\_\_\_

We have given careful consideration to the proposed and hereby agree, if this proposal is approved, that we will provide all equipment, furnish all materials, and perform all services necessary for the work specified.

FIRM NAME: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Print Name and Title: \_\_\_\_\_

Change Orders	C.O. Amount/ Allowance Amt	C.O. Days	Council Date	REASON FOR CHANGE
Revision Date	New Total	Original / New Total	New Comp. Date	
CO#1	\$14,404.00	0	N/A	Revise sewer crossings & cost estimate due to change in structures & flood elevations by USACE. Amount is to be taken from City Manager's Authority. \$136,346.00/\$150,750.00
8/04/05	\$1,596,925.00	275	10/30/05	
Field Order #1	\$1,290.00	0	N/A	Prepare exhibits and convert files to <u>Arcmap</u> format. \$73,710.00/\$75,000.00
8/22/05			10/30/05	
Field Order #2	N/A	60	N/A	Time extension due to City/USACE delays.
10/26/05		335	12/29/05	
Field Order #3	2,800.00	60	N/A	Time extension due to City/USACE delays.
2/09/06	0	395	2/27/06	
CO#2	\$11,998.00	261	N/A	Additional Title Reports, time extension due to City delay. Amount is to be taken from City Manager's Authority. \$124,348.00/\$150,750.00
3/20/06	\$1,608,923.00	656	11/15/06	
Field Order #4	\$941.98	0	N/A	Prepare Brownfield Exhibits. \$69,968.02/\$75,000.00
5/20/06	N/A	656	11/15/06	
Field Order #5	N/A	60	N/A	Time extension due to City/USACE delays.
11/6/06		716	1/14/07	
Field Order #6	N/A	60	N/A	Time extension due to City/USACE delays.
1/08/07		776	3/15/07	
CO#3	\$12,015	730	N/A	Additional design to determine estimate of right of way needed and utility relocations cost for the Corps Limited Re-evaluation Report. Amount is to be taken from City Manager's Authority. \$112,333.00/\$150,750.00
2/1/07	\$1,620,938	1506	3/14/09	
Field Order #7	N/A	60	N/A	Time delays due to City and USACE.
3/09/09		1566	5/13/09	
CO#4	\$1,038,036.34	270	5/05/09	Deliver Phase II of the project per the attached scope and fee.
4/16/09	\$2,658,974.34	1836	2/07/10	
Field Order #8	\$3,600.00	0	N/A	Provide additional sewer flow measurement.
9/14/09	2,662,574.34	1836	2/07/10	
CO#5	\$24,343.00	38	N/A	Accelerate design of lower 850 l.f. of utility plans to meet shovel ready designation. Amount is to be taken from City Manager's Authority. \$87,990.00/\$150,750.00
10/15/09	\$2,683,317.34	1874	3/17/10	
Change Order #6	\$0	180	N/A	Time extension due to City/USACE delays as a result of the January 2010 VE study.
3/4/10	\$2,683,317.34	2054	9/13/10	
Change Order #7	\$0	365	N/A	Time extension due to City/USACE delays as a result of the 2010 VE study and revisions to the 90% plans.
9/9/10	\$2,683,317.34	2419	9/13/11	
Change Order #8	\$0	365	N/A	Time extension due to City/USACE delays as a result of the 2010 VE study and revisions to the 90% plans.
9/8/11	\$2,683,317.34	2784	9/13/12	
Change Order #9	\$0	365	N/A	Time extension due to City/USACE delays as a result of the 2010 VE study and revisions to the 90% plans.
9/13/12	\$2,683,317.34	3149	9/13/13	
Change Order #10	\$0	972	N/A	Time extension due to City/USACE delays.
5/21/15	\$2,683,317.34	4,121	5/12/2016	
Change Order #11	\$0	491	N/A	Time extension due to City/USACE delays.
9/15/16	\$2,683,317.34	4,612	9/15/2017	

Change Order #12	\$0	958	N/A	Time extension to bring current the existing contract and meet the new USACE final design completion date of 04/30/2020
3/7/19	\$2,683,317.34	5,845	4/30/20	
Change Order #13	\$483,100.00	365	3/17/2020	Additional work to bring outstanding tasks to comply with the USACE final design and meet the project schedule for construction delivery, Spring 2021
2/13/2020	\$3,166,417.34	6,210	4/30/21	
Change Order #14	\$374,135.00	180	11/17/2020	Added tasks are supplemental to the design as outlined and requested by the USACE; supplemental survey services, additional side drain analysis, final design and coordination to produce 100% Construction Plans
11/05/2020	\$3,540,552.34	6390	10/27/21	
Change Order #15	\$97,500.00	235	7/06/2021	Added tasks to ensure the real estate certification has sufficient rights. The added tasks will include revised legal descriptions, schedule B maps, segment maps.
6/17/2021	\$3,638,052.34	6625	6/19/22	
Change Order #16	\$151,200.00	470	11/15/2022	Added tasks related to relocation of utilities within BNSF right of way, real estate acquisitions, design of replacement of pedestrian bridge at City Hall, and phased construction plans to meet USACE requirements.
10/27/2022	\$3,789,252.34	7095	10/1/23	
Change Order #17	\$190,700.00	365	4/18/23	Added tasks related to survey services, legal descriptions for real estate acquisitions, low flow channel revisions, pedestrian access at City Hall, and phasing of construction work at the Five Points Intersection.
3/30/23	\$3,979,952.34	7,460	10/1/24	



Ms. Christine Cameron  
City of Flagstaff  
211 W. Aspen Avenue  
Flagstaff, AZ 86001 ("Client")

June 11, 2024  
Job # 204001 (SWI #04473)

RE: Rio De Flag  
Additional Services Change Order #18

Dear Ms. Cameron:

Ardurra has been asked to provide additional services for the design and real estate portions of the project. Please provide a change order for the additional services listed below.

**1.0 SCOPE OF SERVICES, ADDITIONAL**

We propose to provide the following:

<b>Item No.</b>	<b>Description</b>	<b>Fee</b>
<b>1.</b>	<b>Master Easement Tracking Spreadsheet:</b> Ardurra prepared a master easement tracking spreadsheet with every parcel impacted by the project. Each parcel includes the APN, owner, site address, mailing address, type of easement being acquired (Channel Easement, Temporary Work Area Easement, Drainage Easement, Waterline Easement, Sewerline Easement, Etc.), utility conflicts, ongoing tasks, when the legal description was updated and completed, and additional notes for the easements.	<b>\$9,600</b>
<b>2.</b>	<b>Stage 1 Legal Descriptions:</b> Ardurra prepared 14 additional easements for Stage 1 for the Mikes Pike traffic phasing plan, Mikes Pike, and the Flagtown parcels. The legal descriptions are complete and submitted to the City of Flagstaff.	<b>\$8,400</b>
<b>3.</b>	<b>Phase 2 Legal Descriptions:</b> This item includes Segment Map revisions already completed based on USACE comments on the previously prepared segment map. Item also includes up to 25 Public Utility Easements (PUE's), updates to 80 TWAE and Channel Easement legal descriptions already completed (need to be reviewed and updated once segment map is approved), up to 45 aerial easement exhibits, and staking up to 80 parcels for property owners to see the limits of proposed easements.	<b>\$88,300</b>
<b>4.</b>	<b>Utility Compensability:</b> Item includes up to 10 Utility Compensability letters/exhibits. The Utility Compensability deliverable is assumed to be the same as what was submitted to the USACE for Stage 1.	<b>\$4,200</b>
<b>5.</b>	<b>BNSF UAP Applications:</b> Complete BNSF UAP forms and prepare supporting exhibits. Ardurra has already created 19 UAP applications that are ready to submit under Change Order #16. This item includes 24 additional applications.	<b>\$7,200</b>

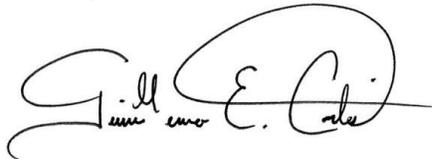
- |     |  |  |
|-----|--|--|
| 6.  | <b>ATR Comment Resolution:</b><br>Item includes addressing City of Flagstaff and USACE ATR comments on the Street Reconstruction and Utility Relocation Plans for both Stages 1 and 2. Plans will be updated and submitted to the City and USACE as part of the Backcheck submittal process. Item includes comment resolution meetings with City staff, coordination with Tetra Tech, and updates to the project specifications.   | <b>\$24,000</b>  |
| 7.  | <b>Five Points Construction Plans:</b><br><u>7.1 Eastbound Right Turn Lane</u><br>An Eastbound right turn lane on Clay Avenue at the Milton intersection is required to address and ATR comment. The right turn lane will be added to the Stage 1 Surface Replacement construction plans.<br><br><u>7.2 30" Waterline Realignment</u><br>The ATR submittal included a 30% water line vertical realignment in the Five Points Intersection. During constructability review, it was determined that the vertical realignment could not be accomplished without closing the entire intersection. An alternate realignment route was identified through APN 103-06-003B that can be constructed without closing the intersection. The Utility Relocation Plans will be updated to reflect the new realignment.<br><br><u>7.3 100% Phasing Plans</u><br>60% construction plans for the Five Points Intersection were completed under Change Order #17. Ardurra prepared and submitted several different traffic phasing plans, including one lane and two lane options, to ADOT before a phasing plan was agreed upon. This item includes addressing ADOT comments and completing 100% construction plans for the traffic phasing plan.<br><br><u>7.4 Traffic Control Plans</u><br>Traffic control plans will be completed and submitted to the City and ADOT for both phases of the Five Points construction. Draft TCP's have already been submitted and reviewed, and Ardurra is currently updating the TCP's for final submittal. | <b>\$3,520</b><br><br><b>\$2,320</b><br><br><b>\$8,320</b><br><br><b>\$8,320</b> |
| 8.  | <b>Architect-Engineer (A-C) QC Plan:</b><br>SWI/Ardurra will prepare a Specific Quality Control Plan using the Hansen Dam Recreation Area Project example provided by the Corps. The document will be revised to be project specific to the Utility Relocation and Surface Replacement plans prepared by SWI/Ardurra. Additionally, a project team from another Ardurra office that has not worked on the RDF project will review the ATR sets of plans for QA/QC.   | <b>\$12,200</b>  |
| 9.  | <b>Meetings &amp; Coordination:</b><br>This item includes the following meetings for an additional 12 months with two SWI/Ardurra staff: <ul style="list-style-type: none"> <li>• Weekly meetings with the City of Flagstaff</li> <li>• Bi-weekly meetings with the City of Flagstaff, Corps, and Tetra Tech</li> <li>• Monthly coordination meetings to coordinate the Lone Tree Overpass and RDF projects.</li> <li>• Monthly coordination meetings with BNSF to coordinate all City projects along the BNSF corridor.</li> </ul>  | <b>\$25,200</b>  |
| 10. | <b>Signal Plans (Lee Engineering):</b><br>Lee Engineering will update the previously prepared traffic signal plans for the Five Points intersection to incorporate the newly added eastbound right turn lane on Clay Avenue.   | <b>\$5,000</b>   |

- 11. **Siphon Plan Updates:** **\$3,000**  
 Water Works will update the previously prepared Siphon construction plans to relocate the vent pipe and update CAD backgrounds as part of the ATR review process.
  
- 12. **Landscape Plans** **\$4,900**  
 Norris will update the landscape plans to address revisions to address ATR comments. Revisions include: landscape plans and details, irrigation plans and details, form liner design and concept drawings, and nine (9) additional meetings. The total change order from Norris is \$12,600. Optional Task 3 in CO #13 (\$7,700) will be used for this change order.

**ASWO#18 DESIGN TOTAL: \$214,480.00**

Your signature below will serve as your acceptance of this Work Order, pursuant to the terms and conditions of the original contract. Feel free to call if you have any questions or concerns.

Sincerely,



Guillermo E. Cortes, P.E.  
 Vice President

Accepted: \_\_\_\_\_ Date: \_\_\_\_\_

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Ben Mejia, Planner  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



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**TITLE:**

**Consideration and Approval of Preliminary Plat:** PZ-23-00027-01: Preliminary replat of lots 23-24 and Tract E of the "Final Plat for Coconino Ridge at Pine Canyon"

**STAFF RECOMMENDED ACTION:**

Approve the Preliminary Plat in accordance with the findings presented in this report and the Planning and Zoning Commission recommendation of approval (5-0 vote in favor on May 22, 2024).

**Executive Summary:**

TLC PC Land Investors, LLC and Coconino Ridge at Pine Canyon, LLC request Preliminary Plat approval for Preliminary replat of lots 23-24 and Tract E of the "Final Plat for Coconino Ridge at Pine Canyon" located at 2460 S Pinyon Jay Dr, an existing 31 unit subdivision on 19.2 acres in the Single-Family Residential (R1) Zone. The site has a Resource Protection Overlay and is currently subdivided. It is located in the northeastern corner of the larger 660-acre Pine Canyon development.

**Financial Impact:**

There are no financial impacts associated with this Preliminary Plat.

**Policy Impact:**

There are no policy impacts affiliated with this Preliminary Plat.

**Previous Council Decision or Community Discussion:**

The final plat for Coconino Ridge at Pine Canyon was approved by Council in 2016. The request for replat is to modify the approved plat to allow Tract E for use as private road.

**Options and Alternatives to Recommended Action:**

1. Approve the Preliminary Plat with no conditions.
2. Approve the Preliminary Plat with conditions.
3. Deny the Preliminary Plat based on non-compliance with the Zoning Code, the Subdivision Code, and/or the Engineering Standards and Specifications for New Infrastructure.

**Background and History:**

In 2016, the City of Flagstaff approved the Coconino Ridge at Pine Canyon subdivision as a 32-lot subdivision within the R1 Zone. Since recordation of the plat, one parcel (Lot 32) has been combined with neighboring parcels, currently 31 lots exist within the subdivision. All areas in the subdivision not allocated as lots are reserved as tracts. Tract E was reserved as private open space, public utility easement, and private drainage easement. This Preliminary Plat request is to replat the existing Coconino Ridge at Pine Canyon subdivision to reserve Tract E for private roads in addition to private drainage easement and public utility easement. The private open space reservation will be abandoned with this modification. Tract E will be increased in width to



# PLANNING & DEVELOPMENT SERVICES REPORT

## PRELIMINARY PLAT

**PZ-23-00027-01**

**DATE:** May 1, 2024  
**MEETING DATE:** May 22, 2024  
**REPORT BY:** Ben Mejia

### **REQUEST:**

Coconino Ridge at Pine Canyon, LLC and TLC PC Land Investors, LLC request Preliminary Plat approval for replat of the “Final Plat for Coconino Ridge Pine Canyon” located at 2460 and 2473 S Pinyon Jay Dr, within the 31-lot single-family subdivision of Coconino Ridge at Pine Canyon on 19.2 acres in the Single-Family Residential (R1) Zone. The proposed replat modifies the reservation of Tract E to allow private roads and remove the private open space reservation.

### **STAFF RECOMMENDATION:**

Staff recommends the Planning and Zoning Commission, in accordance with the findings presented in this report, forward the Preliminary Plat to the City Council with a recommendation of approval.

### **PRESENT LAND USE:**

The subject site is an existing subdivision with 31 single-family residential lots on 19.2 acres in the R1 zone. Tract E, modified by this request, is currently reserved for private open space, private drainage easement, and public utility easement.

### **PROPOSED LAND USE:**

The proposal is to modify Coconino Ridge at Pine Canyon subdivision, consisting of 31 single-family lots located on 19.2 acres in the R1 Zone to reserve Tract E for private road use in addition to private drainage easement and public utility easement. The Open Space use will be abandoned with this modification. Lots 23 and 24 will be reduced in size to allow for the road use of Tract E.

### **NEIGHBORHOOD DEVELOPMENT:**

See the attached vicinity map for more information.

North: Juniper Point, RR Zone

South: Deer Creek Crossing Unit One, R1 Zone

East: Undeveloped 126-acre parcel of formerly State Trust Land, RR Zone; National Forest, PF Zone

West: Deer Creek Crossing Unit One, R1 Zone

### **REQUIRED FINDINGS:**

The Planning and Zoning Commission shall find the proposed Preliminary Plat meets the requirements of the City Code Title 10, Flagstaff Zoning Code; City Code Title 11, General Plans and Subdivisions; and City Code Title 13, Engineering Design Standards and Specifications.

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### **STAFF REVIEW:**

#### **I. Project Information**

##### **A. Background**

In 2016, the City of Flagstaff approved the Coconino Ridge at Pine Canyon subdivision as a 32-lot subdivision within the R1 Zone. Since recordation of the plat, one parcel (Lot 32) has been combined with neighboring parcels, currently 31 lots exist within the subdivision. All areas in the subdivision not allocated as lots are reserved as tracts. Tract E was reserved as private open space, public utility easement, and private drainage easement.

**B. Type of Plat**

This Preliminary Plat request is to replat the existing Coconino Ridge at Pine Canyon subdivision to reserve Tract E for private roads in addition to private drainage easement and public utility easement. The private open space reservation will be abandoned with this modification. Tract E will be increased in width to accommodate the road, and Lots 23 and 24 will be reduced in size. No new lots are proposed with this plat.

**II. Required Findings: Conformance with City Development Standards and Regional Plan**

Staff reviewed and approved the Preliminary Plat based on conformance with City Code Title 10, Flagstaff Zoning Code; City Code Title 11, General Plans and Subdivisions; and City Code Title 13, Engineering Design Standards and Specifications.

**A. City of Flagstaff Zoning Code (Title 10)**

**i. Single-Family Residential (R1)**

The modifications to this plat are in conformance with the requirements of R1 zone. The density will be consistent with existing conditions of the subdivision. The impacted lots meet the required size and dimension for the R1 zone. Both lots will be reduced from approximately 17,000 sq. ft. to approximately 14,000 sq. ft. which exceed the 6,000 sq. ft. minimum for the zone. This Preliminary Plat complies with the building form and placement standards such as setbacks for the R1 zone (Division 10-40.30.030 of the Zoning Code).

Setback requirements for R1 zone are:

Front:	15' , 25' parking
Side:	8' interior, 15' street side
Rear:	25'

**ii. Natural Resources**

The subject property is located within the Resource Protection Overlay. Resources within this plat are limited to forest resources. The minimum required tree protection rate for residential zones is 50%. The replat will result in a minor resource preservation rate reduction from 52.7% to 50.3%. To mitigate the reduction of resources for the proposed roadway, the building envelopes of Lots 23 and 24 have been reduced.

**iii. Historic/Cultural Resources**

Cultural resource clearance was completed as part of the original plat approval. No additional review was required.

**iv. Parks, Open Space, Pedestrian, and Bicycle Facilities**

While no parks or open space are required for this subdivision, the Pine Canyon development area includes open space amenities for its residents.

As part of the overall Pine Canyon development, a 10-foot-wide paved FUTS trail from the intersection of existing Lone Tree Road to the intersection of JWP Blvd along the north side of the extension of Lone Tree Road to the intersection of Zuni was completed. A 10-foot-wide paved FUTS trail was also constructed from the intersection of Lake Mary Road on the east side of JWP Blvd to the Lone Tree intersection. An extension of the trail was constructed from the intersection of existing Lone Tree/JWP eastward along the south side of JWP towards the proposed third entrance to Pine Canyon where

the FUTS penetrates into the Pine Canyon development and extends to Fisher Point. This portion of the FUTS trail runs along the western side of the proposed subdivision but is located within the Deer Creek Crossing Subdivision.

## **B. City of Flagstaff Subdivision Standards (Title 11)**

### **i. Preliminary Plat**

IDS approved the Preliminary Plat based on conformance with the procedures and application requirements outlined in Section 11-20.60: Preliminary Plat on April 18, 2024.

### **ii. Subdivision Standards and Regulations**

IDS also approved the Preliminary Plat based on conformance with relevant standards in Section 11-20.120: Subdivision Design Standards and Requirements.

#### **ii.1 Lot Design**

The proposed changes to the subdivision meets the standards for lot design:

- Meet the minimum lot width, depth, and size requirements of the Zoning Code.
- Be designed appropriately for the location and character of the proposed development, street improvements, and underlying topography.
- All lots shall be lawfully built upon and be developable (lots are designed in a way so that development can meet all relevant development standards).
- Buildable area (building envelope) shall be located away from the crest of ridge lines.
- Buildable area shall be determined by setback requirements and the location of natural topographic features.

#### **ii.2 Street Design**

The proposed subdivision meets the standards for street design:

- Existing street design was developed under previous Code which allowed private streets to be constructed without meeting City standards in accordance with the development agreement. The proposed road would be within the bounds for the development agreement.
- Street design is appropriate for underlying topography and in relation to existing streets. Where feasible, streets shall be placed on top of ridges to minimize the extent of grading and reduce the visual impact of development.

#### **ii.3 Easement Design**

The proposed subdivision meets the standards for easement design:

- Easements shall be provided and dedicated where deemed necessary for specific purposes (the plat will dedicate a public utility easement and a drainage easement).
- Drainage easements shall substantially follow the line of any existing watercourse that traverses the land.

#### **ii.4 Block Design**

The proposed subdivision meets the standards for block design:

- Blocks in non-transect zones shall not normally exceed 1,200 feet in length measured from the property lines, except in hillside developments or where a subdivision of one-half acre lots or larger justify or require a variation from this requirement, or where there are unusual conditions of the property being subdivided.

### **iii. Minimum Required Subdivision Improvements**

The subdivider is required to improve all streets, pedestrian ways, alleys, and easements in the subdivision and adjacent to it as required to serve the subdivision. Staff review of the Preliminary Plat along with the impact analyses discussed in the Engineering Standards section below identified the required improvements in conformance with

Section 11-20.130: Minimum Required Subdivision Improvements. These improvements will formally be approved with Civil Engineering Plans review, which will occur after Preliminary Plat approval by City Council.

**C. City of Flagstaff Engineering Standards (Title 13)**

As part of the Preliminary Plat review, Staff conducted a public systems analysis to confirm preliminary compliance with Engineering Standards. Following Preliminary Plat approval, the applicant shall submit and receive approval for Civil Engineering Plans for the subdivision prior to review and approval of the Final Plat. Approval of the Civil Engineering Plans will be contingent on the plat meeting City Engineering Standards.

**i. Access and Traffic**

A Traffic Impact Analysis was prepared and approved for the entire Pine Canyon master planned community. Improved access to the development is provided by John Wesley Powel (JWP) Blvd from Lake Mary Road, and by the extension of Lone Tree Road from the intersection of Lone Tree Road and Zuni Drive to the new intersection of JWP Blvd. All interior streets within Pine Canyon are private and maintained by the Homeowner’s Association.

A private looped street named Clubhouse Circle provides access throughout Pine Canyon. E. Telluride Drive provides access to the subject site from Clubhouse Circle. The street design within the subdivision consists of a cul-de-sac street named Pinyon Jay Drive. The cross section of the private streets provides a 27-foot-wide street section with rolled curb and gutter on both sides and a five-foot wide tail on both sides of the street. The expansion of Tract E to 61 feet wide would accommodate a higher street design dependent on future development to the east.

**ii. Water and Wastewater**

The development is serviced by a Zone B water pressure system. All of the water mains are public. A twenty (20) inch transmission main within the alignment of JWP Blvd was extended from Lake Mary Road into Pine Canyon. A sixteen (16) inch looped water main has been constructed within the alignment of Clubhouse Circle. A new eight (8) inch water line extends from Telluride Drive into the subdivision to provide water service.

Eight-inch public sewer lines have been constructed beneath the public and private streets. These public mains flow by gravity into a private lift station. This private lift station transfers the wastewater through a force main north into a public gravity sewer line. All maintenance associated with the private force mains and lift station is the responsibility of the developer/Homeowner Association. An eight (8) inch sewer line extends from Telluride Drive into the subdivision to provide service.

**iii. Stormwater**

A Stormwater Analysis was completed for the entire Pine Canyon development and was accepted by the Stormwater Manager. The development was required to provide subregional on-site detention in the golf course ponds that serve as a dual purpose for storage of irrigation water and stormwater detention. Development of the first phase and golf course constructed this system.

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**REQUIRED FINDINGS:**

The Planning and Zoning Commission shall find the Preliminary Plat meets the requirements of the City Code Title 10, Flagstaff Zoning Code; City Code Title 11, General Plans and Subdivisions; and City Code Title 13, Engineering Design Standards and Specifications.

**Recommendation**

Staff recommends the Planning and Zoning Commission, in accordance with the required findings presented in this report, forward the Preliminary Plat to the City Council with a recommendation of approval.

**Attachments:**

- Application
- Preliminary Plat



# City of Flagstaff

# Community Development Division

211 W. Aspen Ave  
Flagstaff, AZ 86001  
www.flagstaff.az.gov

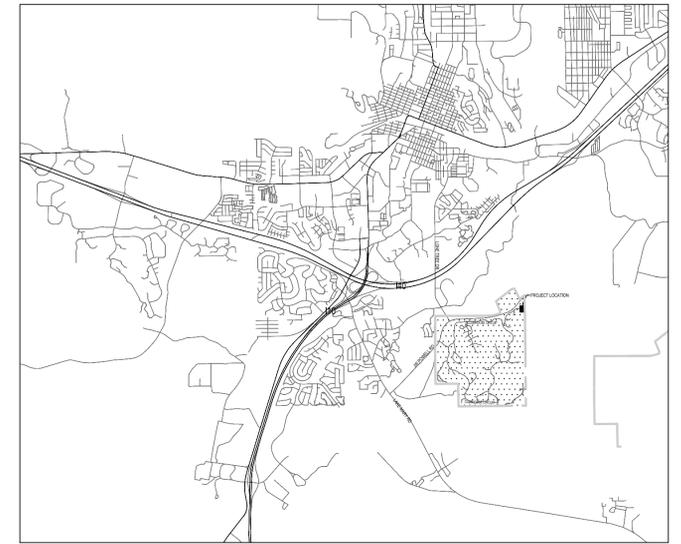
P: (928) 213-2618

<b>Date Received</b>		<b>Application for Subdivision Review</b>		<b>File Number</b>
<b>Property Owner(s)</b> Coconino Ridge at Pine Canyon, LLC; TLC PC Land Investors LLC			<b>Phone</b> 480-498-3300	
<b>Mailing Address</b> 8601 N. Scottsdale Road		<b>City, State, Zip</b> Scottsdale, AZ 85253	<b>Email</b> tseverson@symmetrycompanies.com	
<b>Applicant(s)</b> Coconino Ridge at Pine Canyon, LLC; TLC PC Land Investors LLC			<b>Phone</b> 480-498-3300	
<b>Mailing Address</b> 8601 N. Scottsdale Road		<b>City, State, Zip</b> Scottsdale, AZ 85253	<b>Email</b> tseverson@symmetrycompanies.com	
<b>Project Representative</b> Lindsay Schube, Gammage & Burnham PLC			<b>Phone</b> 602-256-4471	
<b>Mailing Address</b> 40 N. Central Ave, 20th Floor		<b>City, State, Zip</b> Phoenix, AZ 85004	<b>Email</b> lschube@gblaw.com	
<b>Requested</b>		<input type="checkbox"/> Development Master Plan	<input type="checkbox"/> Conceptual Plat	<input type="checkbox"/> Preliminary Plat P&Z and Council
<b>Review:</b>		<input type="checkbox"/> Modified Subdivision	<input checked="" type="checkbox"/> Preliminary Plat	<input type="checkbox"/> Final Plat- Council

<b>Project Name:</b> Coconino Ridge at Pine Canyon - Replat Lots 23, 24, Tract E		<b>Site Address</b> 2460 S Pinyon Jay		<b>Parcel Number</b> 105-22-084, -085, -098	
<b>Proposed Use</b> Lots, Private Road, PUE, Drainage Esmt		<b>Existing Use</b> Lots, PUE, Drainage Esmt		<b>Subdivision, Tract &amp; Lot Number</b> Coconino Ridge Lots 23-24, Tract E	
<b>Zoning District</b> R-1		<b>Regional Plan Category</b> Suburban		<b>Flood Zone</b> Zone X	<b>Size of Site (Sq. ft. or Acres)</b> 38,194 sf
<b>Property Information:</b>		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Located in an existing Local/National Historic District? (Name: _____) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Existing structures are over 50 years old at the time of application? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Subject property is undeveloped land?			
<b>Surrounding Uses</b>		<b>North</b>	<b>South</b>	<b>East</b>	<b>West</b>
(Res, Com, Ind)		Residential	Residential	State Land	Private Road
<b>Proposed Use:</b>		<b>Number of Lots</b>	<b>Number of Units</b>	<b>Number of acres per use</b>	<b>Building Square Feet</b>
Residential		No change	N/A	N/A	N/A
Please complete a "Subdivision Review Application" and provide an initialed "Application and Information Checklist" form along with the required number of plans and information as appropriate for a Development Master Plan, Conceptual, Preliminary or Final Plat. <b>Incomplete submittals will not be scheduled.</b>					
<b>Property Owner Signature: (required)</b>		<b>Date:</b> 8/21/23	<b>Applicant Signature:</b>		<b>Date:</b> 8/21/23
<b>For City Use</b>					
<b>Date Filed:</b>		<b>Case Number (s)</b>			
<b>P &amp; Z Hearing Date:</b>			<b>Publication and Posting Date:</b>		
<b>Council Hearing Date:</b>			<b>Publication and Posting Date:</b>		
<b>Fee Receipt Number:</b>		<b>Amount:</b>		<b>Date:</b>	
<b>Action by Planning and Zoning Commission:</b>			<b>Action By City Council:</b>		
<input type="checkbox"/> Approved			<input type="checkbox"/> Approved		
<input type="checkbox"/> Denied			<input type="checkbox"/> Denied		
<input type="checkbox"/> Continued			<input type="checkbox"/> Continued		
<b>Staff Assignments</b>	Planning	Engineering	Fire	Public Works/Utilities	Stormwater

# PRELIMINARY REPLAT OF LOTS 23-24 AND TRACT E OF THE "FINAL PLAT FOR COCONINO RIDGE AT PINE CANYON"

AS RECORDED IN INSTRUMENT 3775754, RECORDS OF COCONINO COUNTY  
LOCATED IN PORTIONS OF SECTION 27 & 34, TOWNSHIP 21 NORTH, RANGE 7 EAST, G&S.R.M. FLAGSTAFF, COCONINO  
COUNTY, ARIZONA



**VICINITY MAP**  
N.T.S.

**OWNER/DEVELOPER:**  
COCONINO RIDGE AT PINE CANYON LLC  
8601 N SCOTTSALE RD SUITE 335  
SCOTTSDALE, AZ 85253  
PH: (480) 498-3300

TLC PC LAND INVESTORS LLC  
8601 N SCOTTSALE RD SUITE 335  
SCOTTSDALE, AZ 85253  
PH: (480) 498-3300

**PREPARED BY:**  
THE WLB GROUP, INC.  
FLAGSTAFF, AZ 86001  
PH: (928) 779-1500  
FAX: (928) 779-1501

**ZONING INFORMATION:**  
EXISTING ZONING = SINGLE FAMILY RESIDENTIAL (R1)  
PROPOSED ZONING = SINGLE FAMILY RESIDENTIAL (R1)

**CONCEPT APPROVAL NOTE:**  
THE CITY APPROVES THESE PLANS FOR CONCEPT ONLY. ALL LIABILITY FOR ERRORS OR OMISSIONS IS THE  
RESPONSIBILITY OF THE DESIGN ENGINEER.

**AREA INFORMATION:**  
GROSS AVERAGE = 0.88 AC±  
NET AVERAGE = 0.88 AC±

**DEDICATION NOTE:**  
TRACT E TO BE RESERVED FOR THE HOME OWNERS ASSOCIATION AS PRIVATE ROADS, PRIVATE  
DRAINAGE EASEMENT, AND PUBLIC UTILITY EASEMENT.

**NOTE:** EXISTING OPEN SPACE OF TRACT E IS TO BE ABANDONED.

## UTILITY ACKNOWLEDGMENTS

ARIZONA PUBLIC SERVICE	DATE
UNISOURCE ENERGY SERVICES	DATE
LUMEN / TERRA TECHNOLOGIES LLC	DATE
OPTIMUM COMMUNICATIONS	DATE

**SHEET INDEX**

1	COVER SHEET AND RESOURCE CALCULATIONS
2	GRADING AND UTILITIES
3	EXISTING CONDITIONS AND BOUNDARIES
4	PRELIMINARY REPLAT BOUNDARIES

**LEGEND**

	EXISTING PROPERTY BOUNDARY
	EXISTING DEVELOPMENT ENVELOPE
	EXISTING EASEMENT
	PROPOSED PROPERTY BOUNDARY
	PROPOSED DEVELOPMENT ENVELOPE
	PROPOSED EASEMENT
	EXISTING SEWER MANHOLE
	EXISTING WATER VALVE
	ELECTRIC TRANSFORMER
	FOUND MONUMENT AS NOTED
	MONUMENT TO BE SET
	CONTROL POINT
	TREE
	FENCE
	CONTOURS 2'
	CONTOURS 5'
	EXISTING LOTS AND TRACTS OF COCONINO RIDGE

**RESOURCE CALCULATIONS**  
VALUES PER COCONINO RIDGE AT PINE CANYON RECORD DRAWING, DATED 3/22/17, BY  
MOGOLLON ENGINEERING & SURVEYING INC.:

**SLOPE RESOURCES**  
17% SLOPE = 109,618 SF TOTAL  
30% = 32,885  
DISTURBANCE = 10,572 SF  
EXCESS 17% SLOPE = 22,313 SF

25% SLOPE  
57,290 SF TOTAL  
20% = 11,458  
DISTURBANCE = 2,407 SF  
EXCESS 25% SLOPE = 9,051 SF

35% SLOPE  
NONE  
SLOPE EXCESS = 31,364 SF

**TREE RESOURCES**  
TOTAL SITE AREA = 836,511 SF ( 19.2 AC)  
SITE AREA OUTSIDE OF SLOPE RESOURCES = 669,603 SF  
DISTURBANCE  
RIGHT-OF-WAY = 80,747 SF TREE AREA DISTURBED = 80,408 SF  
TREE AREA DISTURBED = 10,090 SF  
EASEMENTS = 6,502 SF TREE AREA DISTURBED = 5,695 SF

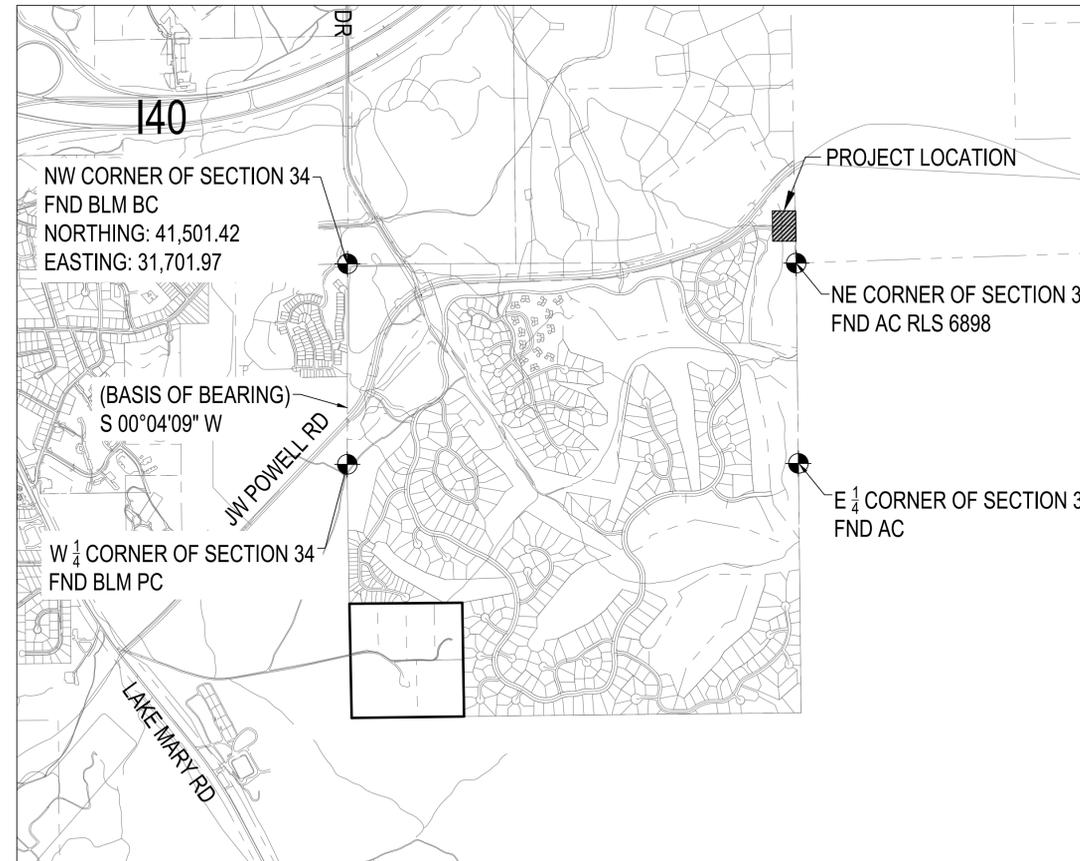
**SETBACKS**  
TOTAL SETBACK AREA = 277,177 SF  
SETBACK AREA IN SLOPES = 3,520 SF  
SETBACK AREA OUTSIDE OF SLOPE = 255,583 SF

TOTAL DISTURBED TREE AREA = 351,776 SF  
TOTAL UNDISTURBED TREE AREA = 321,490 SF

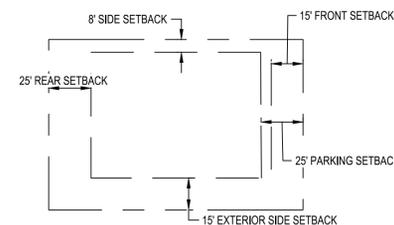
**TREE RESOURCES**  
SITE AREA OUTSIDE OF SLOPE RESOURCES = 669,603 SF  
AVERAGE TECHNIQUE PER 10-50.90  
TOTAL DISTURBED AREA - 351,776 SF  
TOTAL UNDISTURBED AREA - 321,490 SF  
SLOPE EXCESS ADD BACK = 31,364 SF  
TREE RESOURCE PROTECTED = 357,854 SF  
RESOURCE PROTECTION FACTOR - 52.70%

**PER BUILDING ENVELOPE AMENDMENT LOT 19, INST. NO. 3933340:**  
CHANGES TO SETBACK = CHANGE TO DISTURBED AREA = -502 SF  
CHANGE TO UNDISTURBED AREA = + 502 SF

**PRELIMINARY REPLAT RESOURCE CALCULATION UPDATE:**  
SITE AREA OUTSIDE OF SLOPE RESOURCES: 669,603 SF  
TOTAL DISTURBED PER RECORD DRAWINGS AND INST. NO 3933340: 351,274 SF  
LOT 23, 24, AND TRACT E RECONFIGURATION ADDITIONAL DISTURBANCE = 6,862 SF  
PROPOSED SLOPE AND DRAINAGE EASEMENT DISTURBANCE: 4,069 SF  
TOTAL DISTURBED: 364,305 SF  
TOTAL UNDISTURBED: 3045,298 SF  
SLOPE EXCESS ADD BACK: 31,364 SF  
TREE RESOURCE PROTECTED: 336,662 SF  
RESOURCE PROTECTION FACTOR: 50.3%



## LOCATION MAP



PER FINAL PLAT FOR COCONINO RIDGE AT PINE CANYON:  
SETBACKS MAY BE REDUCED FROM CITY ZONING DUE TO RESOURCE  
PROTECTION. REFER TO DESIGN STANDARDS AND C.C.&R.'S FOR MORE  
RESTRICTIVE SETBACKS. LOT DISTURBANCE INCLUDES THE CONSTRUCTION  
OF THE DWELLINGS, DRIVEWAYS, UTILITY CORRIDORS, PATIOS, DECKS,  
ACCESSORY STRUCTURES AND ANY GRADING ACTIVITIES.

### TYPICAL BUILDING SETBACKS PER FINAL PLAT FOR COCONINO RIDGE AT PINE CANYON

N.T.S.



NO.	DATE:	REVISIONS

ENGINEERING • PLANNING • SURVEYING  
 LANDSCAPE ARCHITECTURE • URBAN DESIGN  
 OFFICE LOCATIONS:  
 TUCSON, PHOENIX, FLAGSTAFF, & LAS VEGAS, NV  
 500 N. BEAVER STREET, FLAGSTAFF, AZ 86001  
 PH: (928) 779-1500



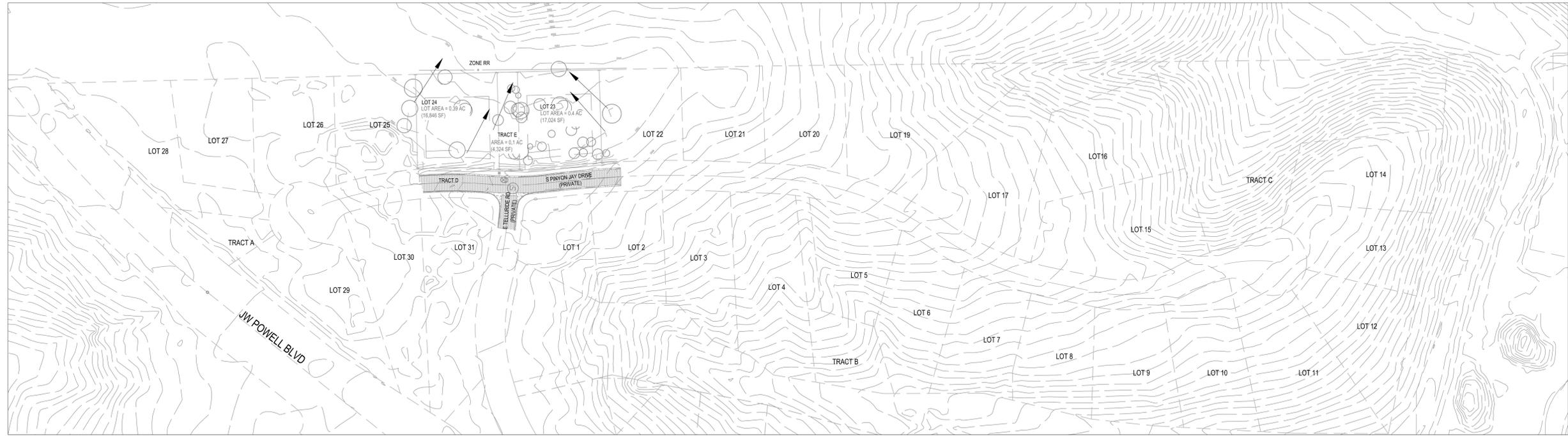
PRELIMINARY REPLAT  
 OF LOTS 23-24 AND TRACT E  
 COVER SHEET

Preliminary Plat for  
 Lots 23-24 and Tract E

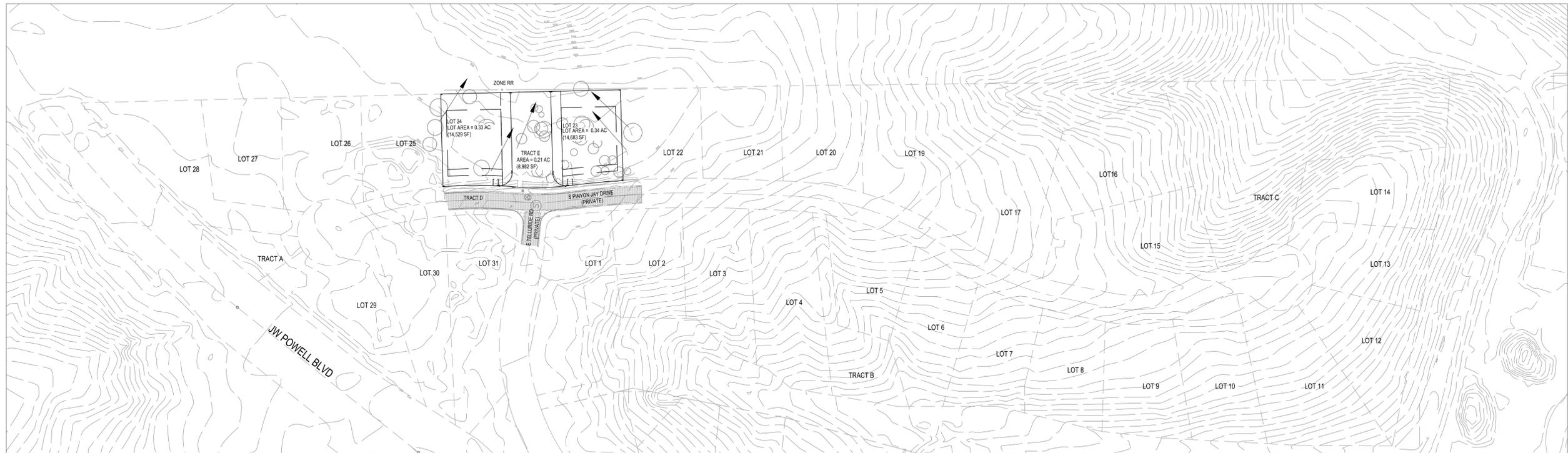
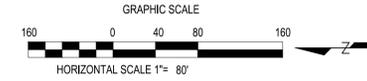
DESIGNED BY:	SB	CHECK BY:	BJ	DATE:	APRIL 2024
DRAWN BY:	SB	CHECK BY:	BJ	DATE:	APRIL 2024

PROJECT NO.  
322024A001

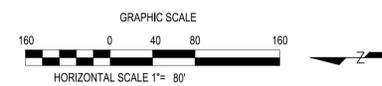
SHEET  
1 OF 4



**EXISTING CONDITIONS**



**PROPOSED CONDITIONS**



NO.	DATE	ITEM

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 OFFICE LOCATIONS:  
 TUCSON, PHOENIX, FLAGSTAFF, & LAS VEGAS, NV  
 500 N. BEAVER STREET, FLAGSTAFF, AZ 86001  
 PH: (928) 778-1500



PRELIMINARY REPLAT  
 OF LOTS 23-24 AND TRACT E  
 GRADING AND UTILITIES

Preliminary  
 Plat for  
 N322024A001

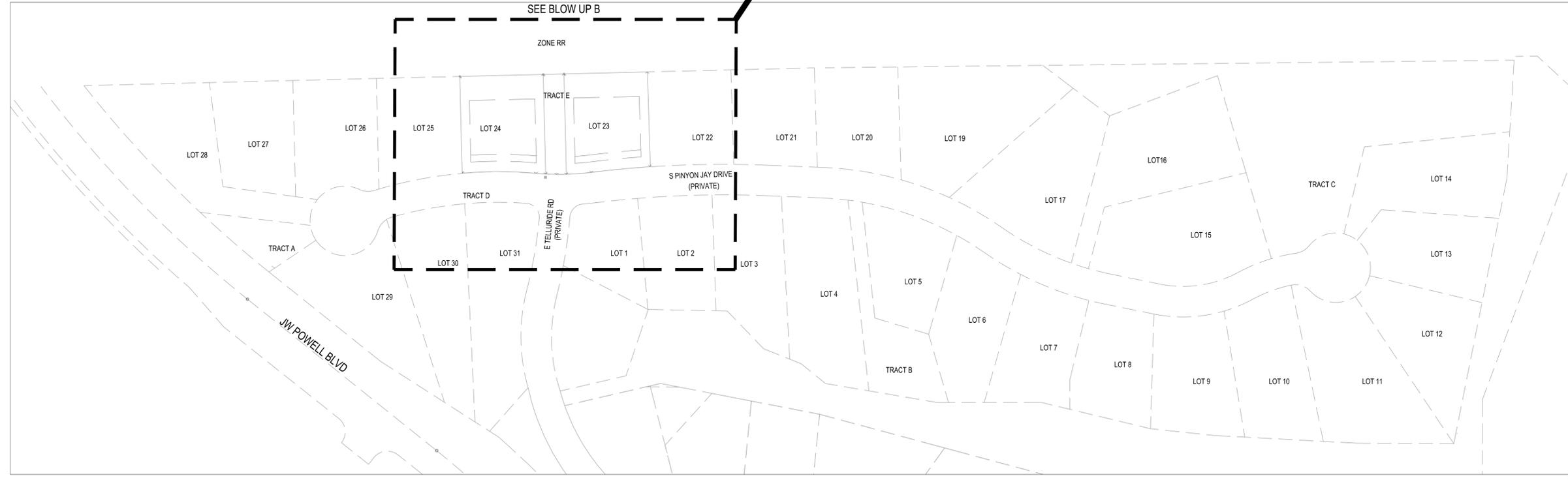
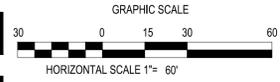
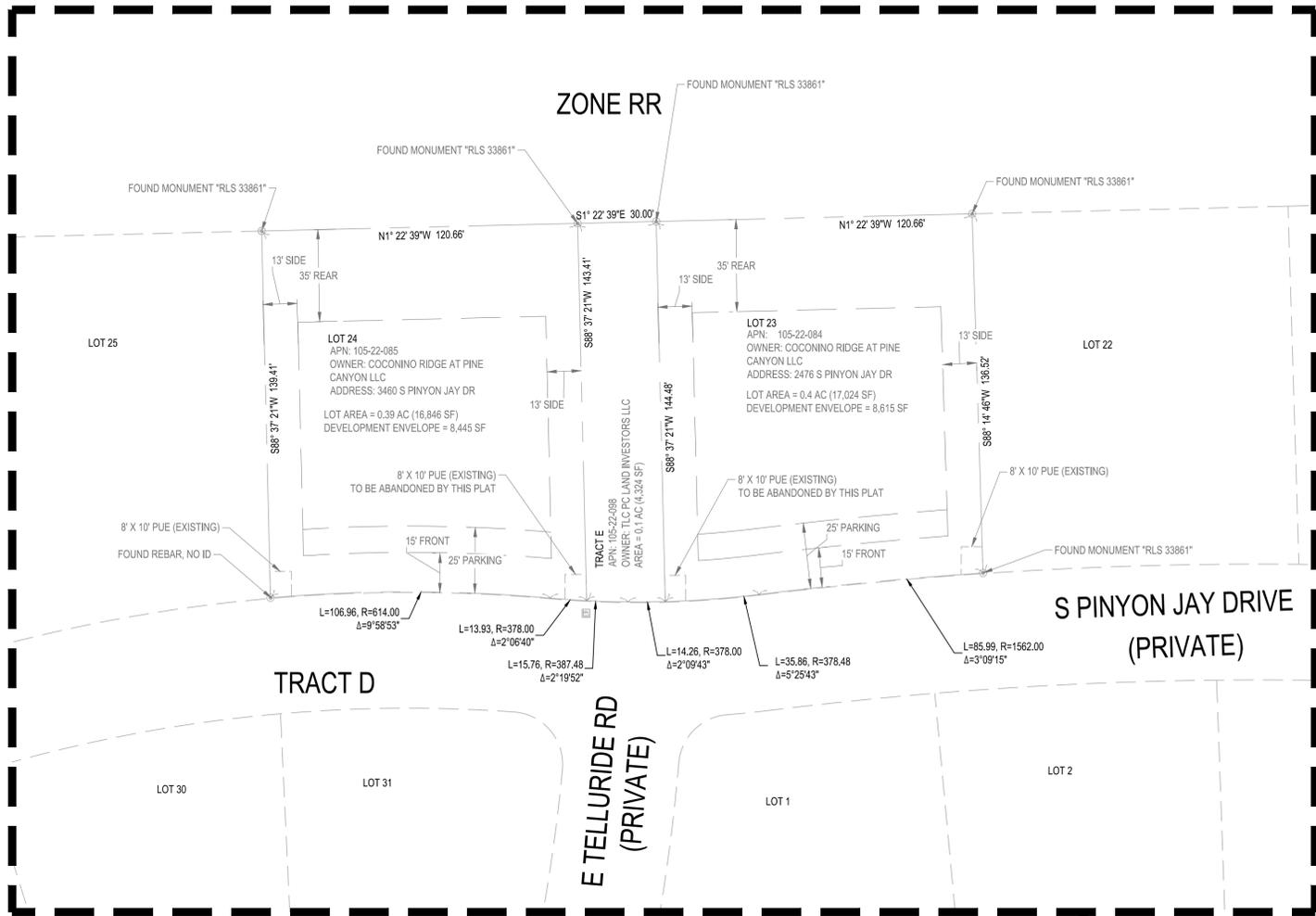
DESIGNED BY:	SB
DRAWN BY:	SB
CHECK BY:	BJ
DATE:	APRIL 2024

PROJECT NO.  
 322024A001

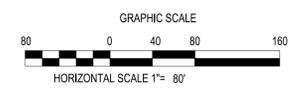
SHEET  
 2 OF 4



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**EXISTING CONDITIONS**



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 OFFICE LOCATIONS:  
 TUCSON, PHOENIX, FLAGSTAFF, & LAS VEGAS, NV  
 500 N. BEAVER STREET, FLAGSTAFF, AZ 86001  
 PH: (928) 778-1500



PRELIMINARY REPLAT  
 OF LOTS 23-24 AND TRACT E  
 EXISTING CONDITIONS  
 BOUNDARY

Preliminary Plat for  
 Lot 23-24 and Tract E

DESIGNED BY: SB  
 DRAWN BY: SB  
 CHECK BY: BJ  
 DATE: APRIL 2024

PROJECT NO.  
 322024A001  
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3 OF 4

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PRELIMINARY REPLAT  
OF LOTS 23-24 AND TRACT E  
OF THE "FINAL PLAT FOR COCONINO RIDGE  
AT  
PINE CANYON"

**Preliminary Plat Approval Request**

City Council | July 2, 2024

Ben Mejia, AICP | Senior Planner





# Request Overview

- Request from Coconino Ridge at Pine Canyon, LLC and TLC PC Land Investors, LLC for **Preliminary Plat approval of Replat of Lots 23-24 and Tract E of the "Final Plat for Coconino Ridge at Pine Canyon"** located at 2460 and 2473 S Pinyon Jay Dr.
- Existing single-family subdivision with 31 single-family home lots on 19.2 acres in the Single-Family Residential (R1) Zone also within the Resource Protection Overlay Zone(RPOZ)
- Staff approved the Preliminary Plat of this replat on April 18, 2024
  - P&Z Commission recommended approval (5-0) on May 22, 2024

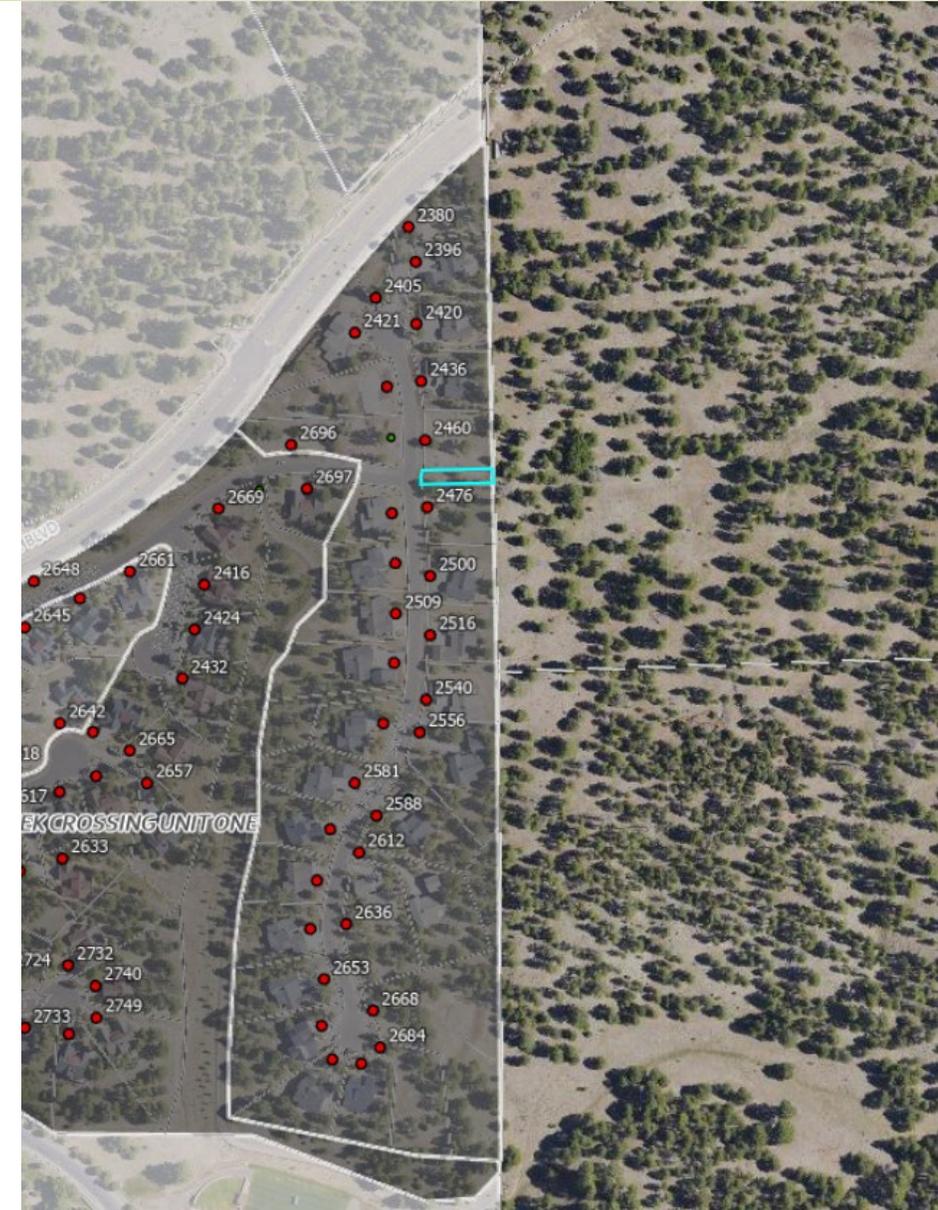




# Coconino Ridge at Pine Canyon- Background

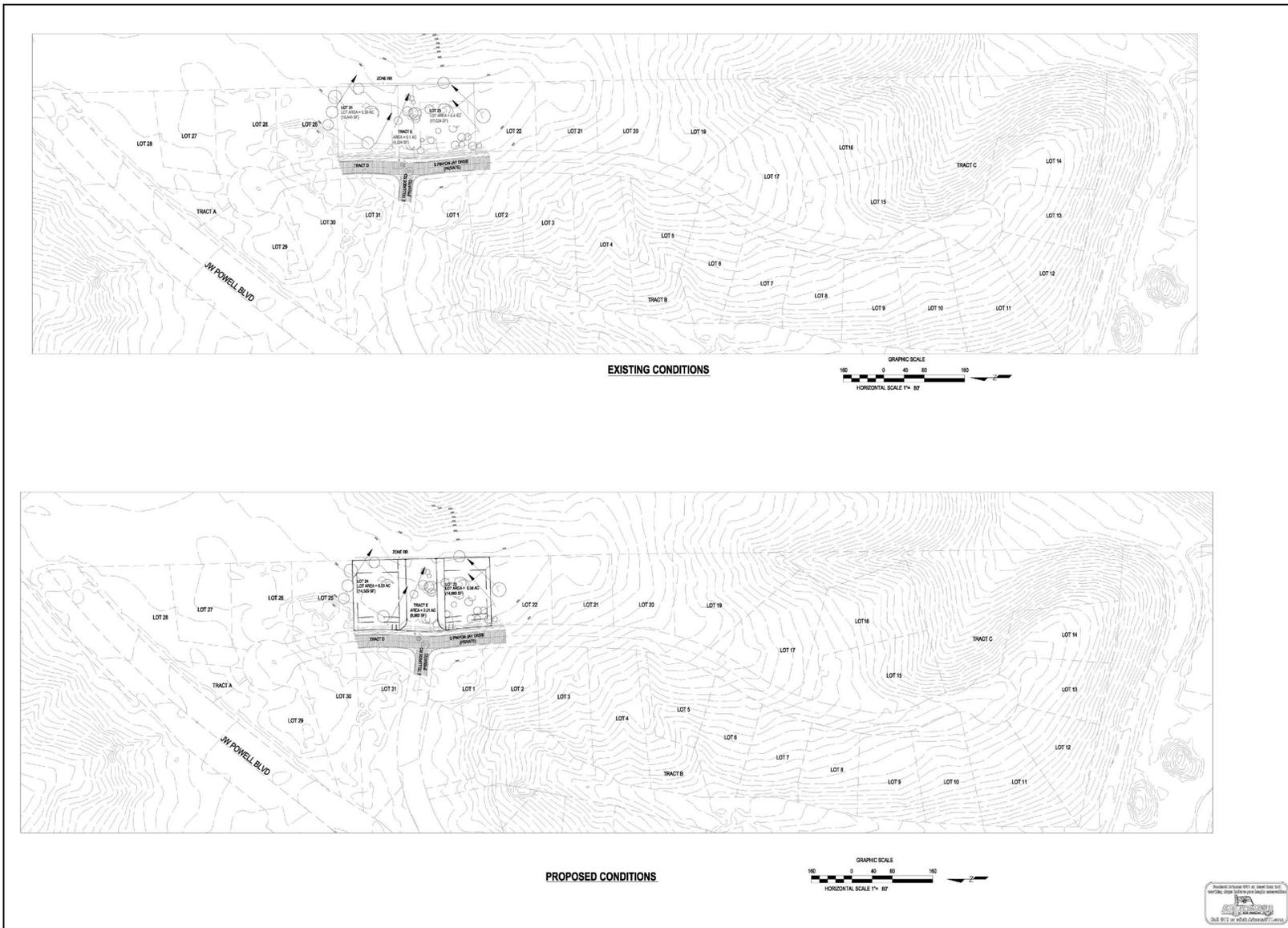


- In 2017, Coconino Ridge at Pine Canyon was recorded as a 32-lot subdivision within the R1 Zone.
- Since recordation of the plat, one parcel (Lot 32) has been combined with neighboring parcels, currently 31 lots exist within the subdivision.
- Tract E was reserved as private open space, public utility easement, and private drainage easement.





# Replat of Lots 23-24 and Tract E of the "Final Plat for Coconino Ridge at Pine Canyon"



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DESIGNED BY: [blank]  
 DRAWN BY: [blank]  
 CHECKED BY: [blank]  
 DATE: [blank]

THE WLB GROUP, INC.  
 1001 BURNING TREE CIRCLE, SUITE 100  
 FLAGSTAFF, ARIZONA 86001  
 PHONE: 908.779.3300

**PRELIMINARY REPLAT  
 OF LOTS 23-24 AND TRACT E  
 GRADING AND UTILITIES**

Planning  
 Division  
 City of  
 Flagstaff  
 Coconino  
 County

DESIGNED BY: [blank]  
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 DATE: [blank]

PROJECT NO.  
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**2 OF 4**

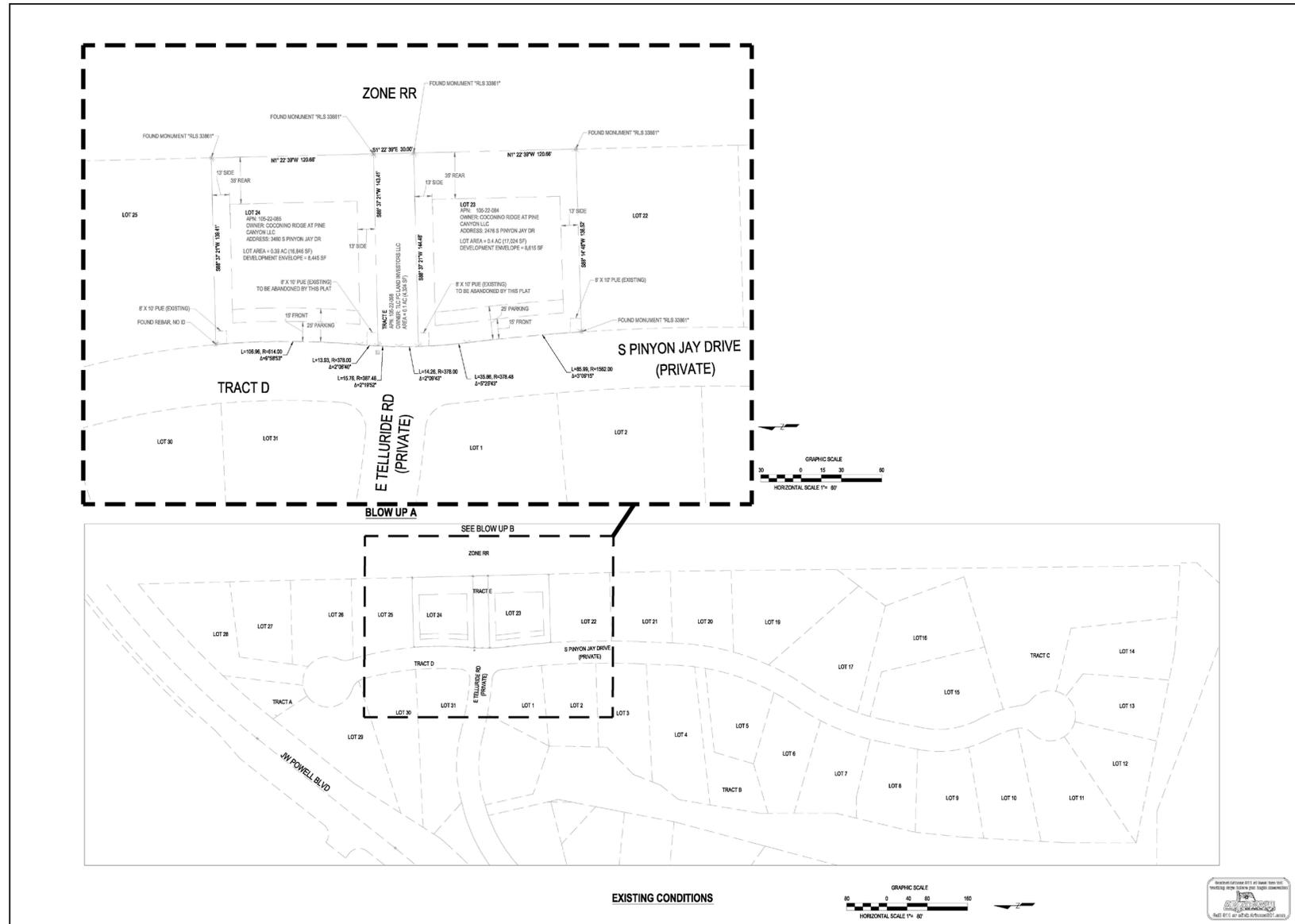




# Existing Conditions



- Tract E was reserved as private open space, public utility easement, and private drainage easement.
- Tract E width 30'
- Lots 23 and 24 approximately 17,000 sf
- Resource calculation: 52.7%



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NO.	DATE	ITEM

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TRUCKEE, INDEPENDENCE, FLAGSTAFF, & LAS VEGAS, NV  
300 N. BEAVER STREET, FLAGSTAFF, AZ 86001  
PH: 908.759.5900



PRELIMINARY REPEAT  
OF LOTS 23-24 AND TRACT E  
EXISTING CONDITIONS  
BOUNDARY

Preliminary  
Not for  
Construction

DESIGNED BY:	SK
DRAWN BY:	SK
CHECKED BY:	BU
DATE:	APR 22, 2024

PROJECT NO.  
322024A001

SHEET  
3 OF 4

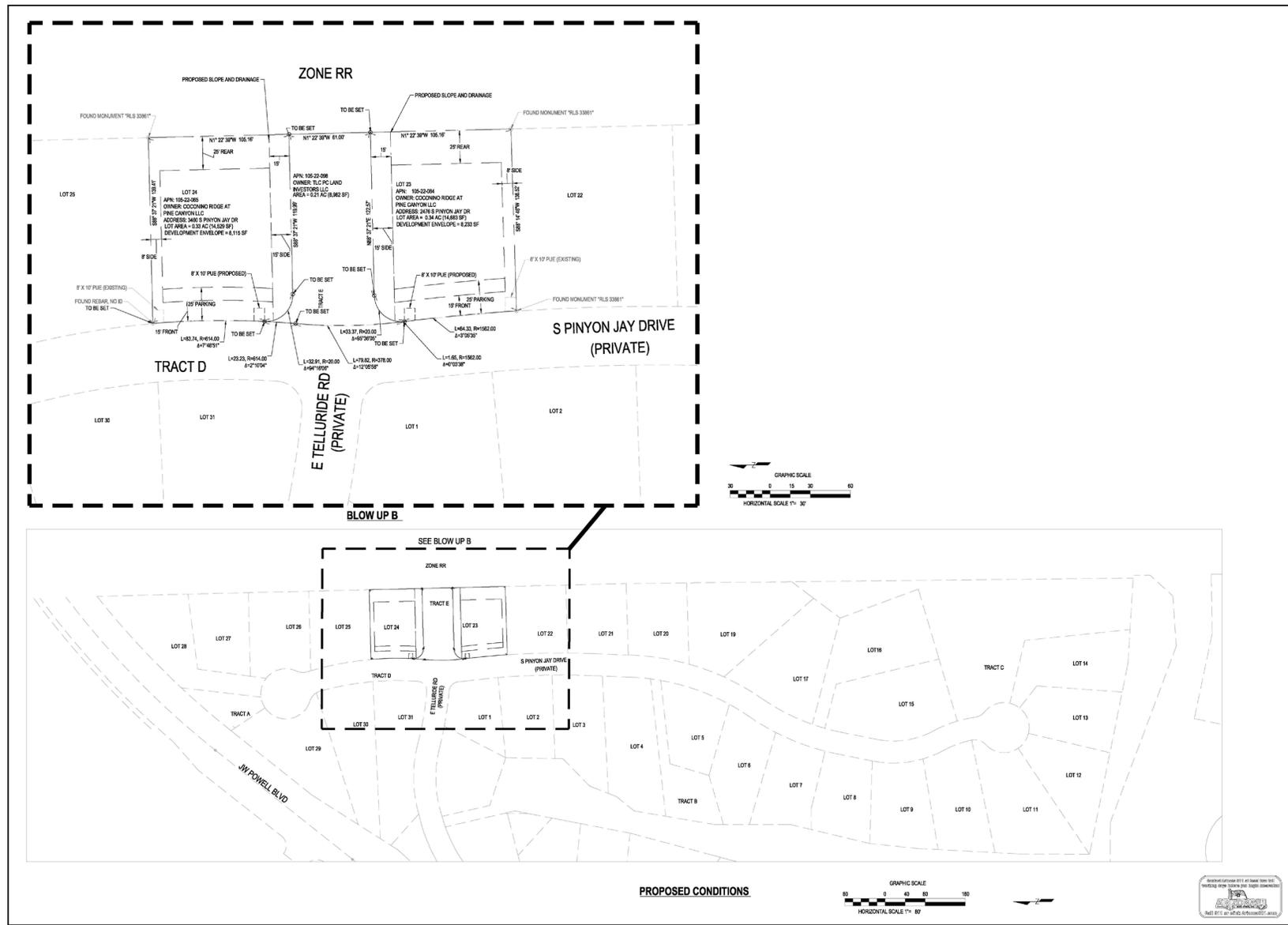




# Proposed Conditions



- Reserve Tract E for private roads
- Private drainage easement and public utility easement to remain
- Private open space reservation to be abandoned
- Tract E increased in width to 61'
- Lots 23 and 24 approximately 14,000 sf.
- Tree preservation: 50.3%



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NO.	DATE	REVISIONS

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 LANDSCAPE ARCHITECTURE • URBAN DESIGN  
 TUCSON, PHOENIX, FLAGSTAFF & ALBUQUERQUE, NM  
 100 N. BEAVER STREET, FLAGSTAFF, AZ 86001  
 PH: 908.775.8800



PRELIMINARY REPEAT  
 OF LOTS 23-24 AND TRACT E  
 PRELIMINARY REPEAT  
 BOUNDARY

Preliminary  
 Not For  
 Construction

DESIGNED BY: [blank]  
 DRAWN BY: [blank]  
 CHECK BY: [blank]  
 DATE: 04/22/2024

PROJECT NO.  
 322024A001

SHEET  
 4 OF 4





# Required Finding #1: Zoning Code (Title 10)



## Meets Single-Family Residential (R1) Standards

### Density

- The density will be consistent with existing conditions of the subdivision.

### Lot design and resource protection

- Lots designed to meet resource protection requirements using specific building envelopes

### Lot sizes

- Proposed lot sizes are approximately 14,000 sq. ft., exceeding the 6,000 sq. ft. minimum of Zone
- Proposed lot dimensions are approximately 84' wide and 135' deep, exceeding the 65'x100' minimum per zone

### Setbacks

- Conforms with the R1 minimum setbacks:
- Front = 15', 25' parking
- Side = 8' interior, 15' Street
- Rear = 25' min

***Zoning Code allows City Council to approve alternate lot sizes and setbacks on a final plat***



# Required Finding #1: Zoning Code (Title 10)



## Meets other relevant standards

- Historic/Cultural Resources
  - Cultural Resource clearance completed with original approval
- Parks, Open Space, Pedestrian, Bicycle Facilities
  - While no parks or open space are required for this subdivision, the Pine Canyon development area includes open space amenities for its residents.
  - FUTS trail runs along southern and western boundary of Coconino Ridge at Pine Canyon subdivision within Deer Creek Crossing Unit One



## Meets Engineering Standards

- Public systems analysis conducted to confirm preliminary compliance with Engineering Standards
  - Compliance confirmed with Civil Engineering Plans (after Preliminary Plat approval)
- Access and Traffic
  - A Traffic Impact Analysis (TIA) was not required for this subdivision. A TIA was completed for the entire Pine Canyon development area.



# Required Finding #2: Engineering Standards (Title 13)



## Meets Engineering Standards

### Water and Wastewater

- 8" water line provided with the existing streets serving subdivision
- 8" sewer line –each lot provided with a tap

### Stormwater

- Stormwater Analysis was completed for the entire Pine Canyon development



# Required Finding #3: Subdivisions Standards (Title 11)



## Meets Subdivision and Land Split Regulations (Chapter 11-20)

- Meets Preliminary Plat procedures, application requirements
- Minimum Required Subdivision Improvements
  - Identified in public systems analyses (previous slides)



# Required Finding #3: Subdivisions Standards (Title 11)



## Meets Subdivision and Land Split Regulations (Chapter 11-20)

### Subdivision Standards and Regulations

- Lot Design
- Street Design
- Easement Design
- Block Design



# Findings and Recommendation

## Required Findings

- **The City Council shall find the Preliminary Plat meets the requirements of City Code Title 10, Flagstaff Zoning Code; City Code Title 11, General Plans and Subdivisions; and City Code Title 13, Engineering Design Standards and Specifications**

## Staff Recommendation

- **Staff recommends the City Council approve the Preliminary Plat, in accordance with the findings presented in this report and the Planning and Zoning Commission recommendation (5-0).**

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** David McIntire, Community Investment Director  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



---

**TITLE:**

**Consideration of Approval:** City of Flagstaff Workforce Analysis and Strategic Plan

**STAFF RECOMMENDED ACTION:**

Approve the Workforce Analysis and Strategic Plan.

**Executive Summary:**

City Council requested an analysis of the community workforce and the Workforce Development systems in the area. Staff procured Keen Independent Research, LLC through a Request for Statement of Qualifications procurement process. Keen performed its analysis and has provided recommendations in their Workforce Analysis and Strategic Plan. After a discussion with Council in the work session meeting of May 28th, the document was provided to interested parties and the general public. It now returns to City Council for consideration of approval with feedback incorporated.

**Financial Impact:**

The strategies in the plan may have an impact on expenditures of local transaction privilege tax revenues from the hotel and restaurant industries (BBB tax) - Economic Development funding. Many of the strategies and recommendations are focused on staff time and not formal resource expenditures. There are strategies, such as potentially supporting new partner training programs, that would use City BBB resources to support the identified programs. These expenditures would be budgeted and brought to Council as part of implementation of the plan if appropriate. There would likely be no impact on the General Fund.

**Policy Impact:**

The City has generally been a support for our partners' workforce development activities. Keen's recommendation is that we generally remain as a support, but take some leadership in formalizing relationships, convening partners, encouraging and soliciting business feedback, and other areas. This is not a significant policy shift, but may guide staff to be more proactive in specific areas. Additionally, the use of BBB funds to support otherwise ineligible internship programs would be consistent with City use of ARPA Workforce Development Funding, but an increase in scope of use of BBB - Economic Development funds.

The document does not focus on housing or childcare, but it recognizes affordable housing and childcare as pressing issues. The City's Housing Section is responsible for affordable housing at the staff level. Economic Development Staff will look into whether childcare is an area for further policy development or participation.

**Previous Council Decision or Community Discussion:**

Council requested this analysis in a previous budget year and approved the contract in Fall of 2023.

Council heard a presentation on the findings and recommendations of the plan on May 28, 2024.

**Options and Alternatives to Recommended Action:**

Approve the plan as presented and provide feedback on implementation as desired.

Request amendments to the plan and approve it after those are incorporated (likely after Council break).

Do not approve the plan and provide guidance on desired alternatives.

**Background and History:**

Workforce Development is a critical concern in any community's economic development, and that is true for Flagstaff as well. The need to support people in growing their skills benefits both the people who find better jobs and the employers who need skilled labor. Helping ensure the appropriate training for the workforce is available and ties to the needs of employers in the area is an ever-shifting process. Flagstaff faces numerous challenges in this area and Council requested an analysis of the workforce development needs and potential strategies for the City to consider. After a procurement process, staff began working with Keen Independent Research.

Keen did community outreach and interviewed many business and economic leaders in the community. They also worked with Stiletto to ensure the Economic Development Strategic Plan and the strategies in the Workforce Development plan were generally aligned.

**Connection to PBB Priorities and Objectives:**

Addresses the PBB priority: Robust and Resilient Economy

**Connection to Regional Plan:**

Goal ED.2 - Support and encourage an excellent educational system that promotes critical thinking and job training at all levels.

**Connection to Carbon Neutrality Plan:**

Not applicable

**Connection to 10-Year Housing Plan:**

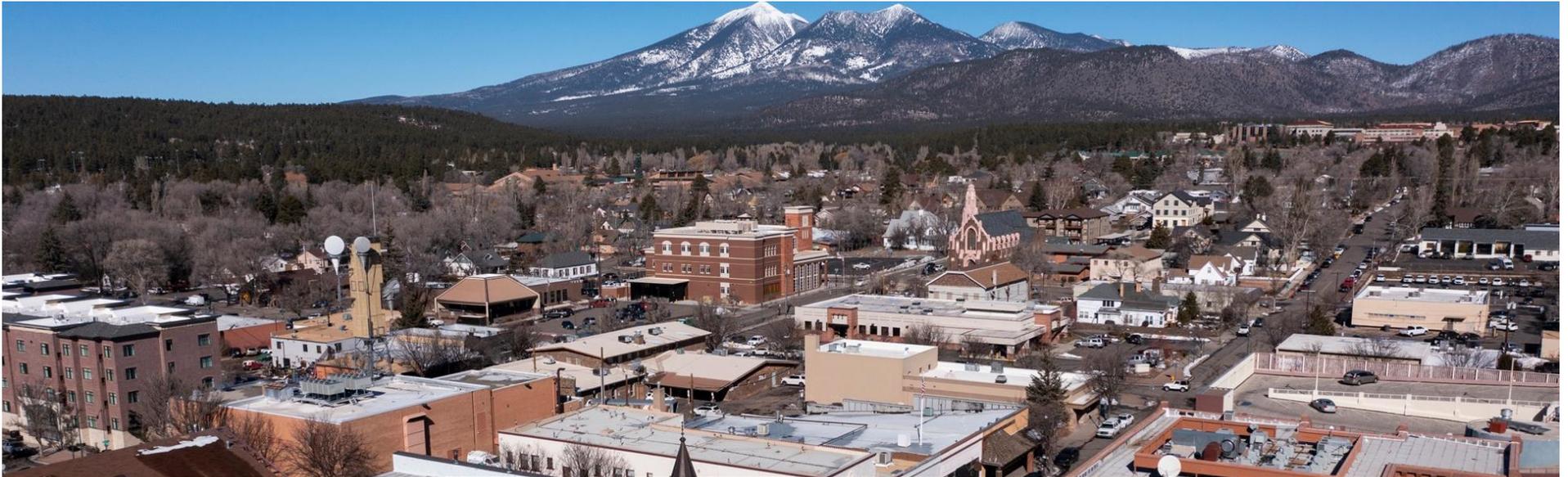
Not applicable

**Connection to Division Specific Plan:**

This will create a division specific plan.

---

**Attachments:**    [Final Workforce Analysis and Plan](#)  
                          [Workforce Presentation](#)



## CITY OF FLAGSTAFF Flagstaff Area Workforce Analysis

### Prepared for:

Dave McIntire  
Community Investment Director  
City of Flagstaff  
211 W Aspen Ave  
Flagstaff AZ 86001

### Prepared by:

**Keen Independent Research LLC**  
2929 Camelback Road, Suite 115  
Phoenix AZ 85016  
303-385-8515  
[www.keenindependent.com](http://www.keenindependent.com)

**Final Report**  
**June 2024**



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# STRATEGIC WORKFORCE DEVELOPMENT PLAN

The City of Flagstaff seeks to ensure that its workforce is prepared for good jobs in Flagstaff’s growing and changing economy. The City retained Keen Independent Research LLC (Keen Independent) to develop a workforce development strategic plan to help the City coordinate efforts to train and fortify workforce in the community.

## Introduction

The City of Flagstaff is at a crossroads. Historically a tight-knit mountain community, Flagstaff continues to attract full-time and part-time newcomers looking to escape to the mountains. Jobs related to Northern Arizona University, the tourism industry and service industries remain important. Second home ownership has contributed to the relative scarcity and high cost of housing. The minimum wage increase may have had unintended consequences, including local business closures and shortages of non-service industry workers. Continuing down this path, Flagstaff could become a community in which its workers cannot afford to live. “Poverty with a view,” a term now at least one-half century old, continues to describe the tradeoff many local workers face when choosing where to put down roots. One question raised in this study is what will keep Flagstaff from going the path of Aspen, where the town is for non-residents and workers make long commutes to local jobs.

The City has an opportunity to chart a different course. By following an economic growth strategy that focuses on sustainable growth and workforce development in key industries and jobs, Flagstaff can create a future in which local talent fills local good jobs and residents can thrive. Residents would be adequately prepared for careers that allow them to support their families in Flagstaff. The City has an economic strategic plan in development that envisions such a future. To prepare for this future and help meet existing labor market needs, the City’s workforce must be intentionally prepared and supported. This plan focuses on the Flagstaff workers and their pathways to economic self-sufficiency.

## City Role in Workforce Development

The plan recognizes that the City is one of many partners in the local workforce development network. It does not have its own workforce development board and does not regularly receive federal funds that support local workforce development. The Coconino County Workforce Development Board is that agency. The City is also not an educational or training institution; city residents are served by an excellent university, community college, K-12 system, individual training organizations and on-the-job training with local employers. The City can be voice, convenor and partner that supports training and good jobs for people who live and work in the community. The plan focuses on this role.

### 1. Downtown Flagstaff, Arizona



Source: SearchNet Media via Wikimedia Commons.

# STRATEGIC WORKFORCE DEVELOPMENT PLAN — Background

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## Methodology

Keen Independent conducted comprehensive research on the local labor market and available workforce training, which included:

- Review of data on labor market composition and trends;
- Inventory of existing workforce development resources for job seekers in the Flagstaff area, including County programs and offerings at the university and community college;
- Interviews and focus groups with City staff, elected officials, Coconino County Workforce Development Board members and staff, higher education and K-12 administrators, and local business owners and company representatives;
- Case studies of workforce development in three communities across the United States similar to Flagstaff; and
- Other research.

## Plan Organization

This plan for the City of Flagstaff to support workforce development is organized as follows:

- Overview of workforce development;
- Background on demographic and labor market trends;
- Overview of existing workforce development resources;
- Summary of comments from stakeholders;
- Lessons learned from case studies;
- Employment pathways; and
- Recommendations for the City.

This plan is supported by several appendices that are referenced throughout the document.

**Priority sectors.** In the City’s new economic development plan, Stiletto (the consulting firm that developed the plan) identified the following sectors as priorities for Flagstaff:

- Astronomy;
- Biomedical and healthcare;
- Food processing;
- Forestry; and
- Manufacturing.

The employment pathways section of this plan considers each priority sector. We also add sections for construction and transportation and utilities. Although not identified as a priority for growth, these additional sectors are prominent in Flagstaff and would benefit from workforce development to ensure that local workers can fill the available jobs. This plan concludes with a summary of goals and actions the City may consider adopting to support its local workforce.

## Context

This plan does not directly consider the important roles the City plays in helping sustain and support a skilled workforce through addressing housing cost and availability, affordable childcare, health and wellness, mobility across the community, environmental amenities, policies that support growing local businesses, inclusive workplaces, and a broad range of other quality of life measures.

These issues were often the first to be mentioned in our research in the community, especially when Keen Independent asked, “What can the City do to support local workers?” They are as or more important to workforce development as any of the measures in this workforce development plan.

## STRATEGIC WORKFORCE DEVELOPMENT PLAN — Workforce development overview

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This plan outlines a role for the City of Flagstaff to play in the development of its workforce. Understanding what workforce development is and how it typically functions helps contextualize this plan and recommendations.

### Defining Workforce Development

Broadly, workforce development refers to programs, training and services designed to help workers gain employment and skills needed for advancement. Typically, workforce development programs and services have one or more of the following components:

- Facilitating job search and placement, primarily into high-quality employment with upward mobility;
- Occupational skills training, often at little to no cost;
- Job search training, which includes advice on how and where to search, resume review and interview preparation; and
- Support services (e.g., direct assistance with transportation, childcare expenses, access to technology, interview clothing).

Workforce development programs are offered by a variety of organizations, including non-profits, colleges and universities and private companies.

### Workforce Innovation and Opportunity Act

The Workforce Innovation and Opportunity Act (WIOA), signed into law in 2014, reauthorized the Workforce Investment Act, which provides federal funding for state and local workforce development programs.<sup>1</sup> WIOA funding supports programs that are designed to develop local workers and connect them with employers.

**Unified state plans.** Under WIOA, states are required to have a unified plan to provide the core workforce development programs outlined in the legislation. These programs include services for adults, youth and displaced workers, among other populations.<sup>2</sup>

**Workforce development boards.** Workforce development boards are entities that serve as conveners of workforce development programs and service providers.<sup>3</sup> State and local boards are stewards of WIOA dollars. The Workforce Arizona Council is the state board responsible for enacting Arizona's workforce development plan. ARIZONA@WORK is the State-level workforce development network that connects job seekers to training and employment. The Council leverages ARIZONA@WORK and partners with local boards to provide targeted services. Local boards are typically at the County level, although some larger cities have one or more workforce development boards.

Flagstaff residents are served by the Coconino County Workforce Development Board. The Board fosters connections between services, workers and employers and aims to support the production of a highly skilled workforce.

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<sup>1</sup> Workforce Innovation and Opportunity Act, Pub. L. No. 113-218 (2014). <https://www.congress.gov/113/bills/hr803/BILLS-113hr803enr.pdf>

<sup>2</sup> Ibid.

<sup>3</sup> National Skills Coalition. (2014) *Update: Side-by-side comparison of WIA and WIOA*. <https://nationalskillscoalition.org/blog/higher-education/updated-side-by-side-comparison-of-wia-and-wioa/>

# STRATEGIC WORKFORCE DEVELOPMENT PLAN — Demographic and labor market trends

We provide an overview of Flagstaff’s demographics and labor market to highlight trends we considered in the construction of this plan. Appendix A reviews this and other information in more detail.

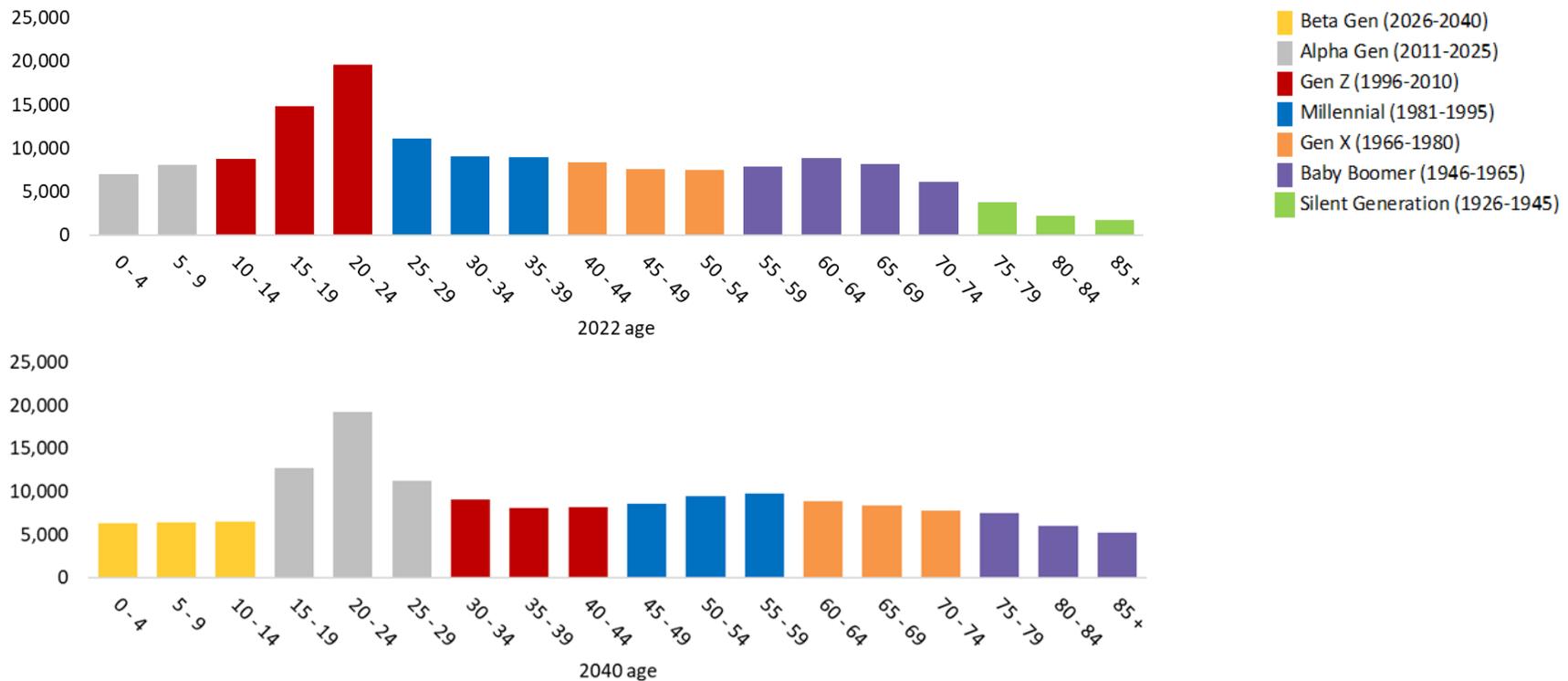
## Demographics

Over the next 15 years, the population of Coconino County is expected to grow from about 150,000 to about 160,000 according to projections by the Arizona Commerce Authority.

Although a modest population increase is expected, the Flagstaff area has for decades experienced an exodus of young adults, many of whom can no longer afford to live in the area. Figure 2 below shows this trend. In 2022, Generation Z is the largest age group, but in 2040, the population of Generation Z has decreased substantially.

The Flagstaff workforce is highly educated. More than half of residents have a bachelor’s degree or higher compared to about a third of Arizona residents (see Appendix A for additional demographic information).

2. Population by age group and generational cohort, Coconino County, 2022 and 2040



Source: Arizona Commerce Authority Coconino County Medium Series Population Projections.

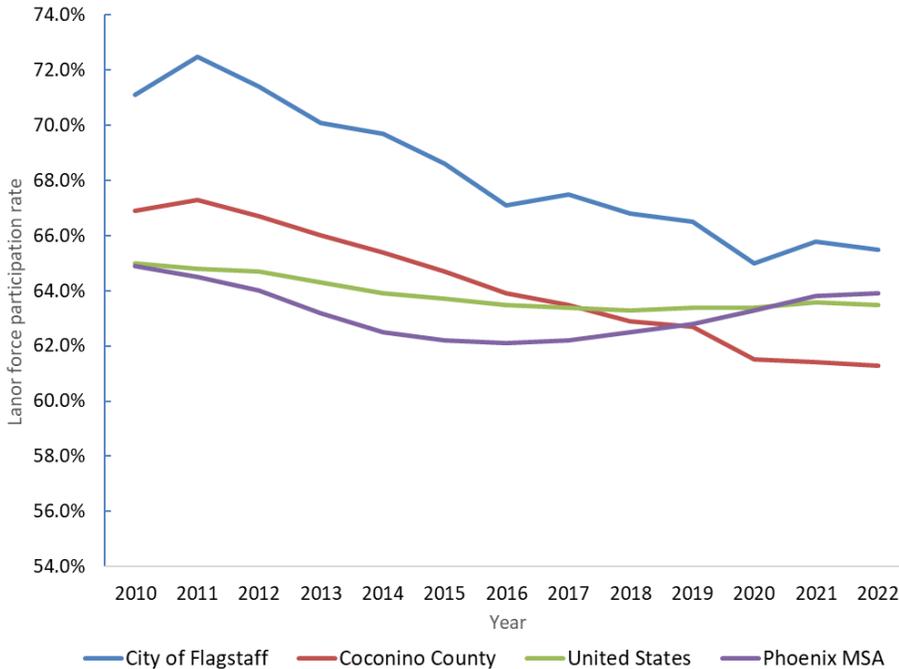
# STRATEGIC WORKFORCE DEVELOPMENT PLAN — Demographic and labor market trends

## Flagstaff Labor Market

Based on past trends, State projections indicate that the county will add the most jobs in the leisure and hospitality industry within the next decade.

**Labor force participation.** Although Flagstaff's population has grown modestly in recent years, the labor force has not kept pace. Figure 3 shows that the labor force participation for city residents is higher than other areas, it has been decreasing

3. Labor force participation rates, 2010-2022



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates.

**Employment and projections by industry.** In 2022, the following industries had the highest levels of employment in Coconino County:

- Leisure and hospitality (17,131 employees);
- Education and health services (16,661 employees); and
- Trade transportation and utilities (10,200 employees).

If current trends continue, professional and business services and construction are expected to also be large employers by 2032. More information on employment trends can be found in Appendix A.

4. Coconino County 2022 and 2032 employment by industry

Coconino County	2022 Employment	2032 Employment	Percentage change	Numeric change
<b>Industry</b>				
Leisure and Hospitality	17,131	19,120	11.6 %	1,989
Education and Health Services	16,661	18,128	8.8	1,467
Trade Transportation and Utilities	10,200	10,907	6.9	707
Professional and Business Services	4,638	6,155	32.7	1,517
Self Employed	4,568	4,282	-6.3	-286
Government	4,215	4,163	-1.2	-52
Manufacturing	3,482	3,525	1.2	43
Construction	2,983	3,622	21.4	639
Other Services	2,395	2,429	1.4	34
Financial Activities	1,700	1,938	14.0	238
Information	543	646	19.0	103
Natural Resources and Mining	233	286	22.7	53
<b>Total</b>	<b>68,749</b>	<b>75,201</b>	<b>100.0 %</b>	<b>6,452</b>

Source: Arizona Commerce Authority, Employment Industry Projections.

## STRATEGIC WORKFORCE DEVELOPMENT PLAN — Existing workforce development resources

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There are many workforce development programs and services that currently serve Flagstaff residents (reviewed in more detail in Appendix B). Some are listed on the eligible training provider list (meaning eligible participants may receive financial support through WIOA to attend) while others are not. As mentioned in the introduction, the City of Flagstaff does not directly receive funds for workforce development. Rather, the Coconino County Workforce Development Board is the recipient of federal workforce development funding.

### Note on Individual Eligibility

We note that subsidization of participation in a WIOA-eligible program also depends on individual income eligibility. Individuals may be eligible to receive WIOA funding for training and educational programs on the eligible training provider list if they qualify as low-income based on:

- Income falling below 70 percent of the Lower Living Standard Income Level (set by the U.S. Department of Labor);
- Receipt of public assistance for the previous six months;
- Homelessness; or
- Disability status.<sup>4</sup>

In 2024, 70 percent of the Lower Living Standard Income Level for a single individual is \$13,951 in a metro area of Arizona and \$13,739 in a non-metro area.<sup>5</sup> Many workers who may benefit from these programs are not eligible for WIOA funding.

We acknowledge this as a major barrier and later in the plan provide suggestions for how the City may help identify workers who can receive WIOA funding and support those who cannot.

### Education Programs

Flagstaff has two major higher education institutions that both provide workforce development programs and services.

**Northern Arizona University.** Major workforce development resources at Northern Arizona University (NAU) include career education and counseling. Career Steps is a series of online career preparation modules available to any NAU student. The Educational Opportunity Centers program offers counseling to low-income participants who want to enter or continue a high school equivalent, postsecondary education or a postsecondary credential program. Additionally, students in NAU's bachelor's degree programs in Nursing and Computer Information Technology are eligible for WIOA funding to support their education.

**Coconino Community College.** Historically an institution that has supported adult education and vocational training, Coconino Community College (CCC) currently offers 24 programs that are eligible for WIOA funding. Commercial Driver's License (CDL) training is one of their more popular programs. Additionally, CCC offers a Career and Technical Education program with eight career pathways that result in an associate's degree or certificate upon completion. CCC offers a variety of non-credit courses.

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<sup>4</sup> ARIZONA@WORK. 2020. "Training Services Adult, Dislocated Worker, and Youth." Coconino County Arizona Workforce Development Board. Retrieved May 17, 2024, from <https://coconino.az.gov/DocumentCenter/View/40173/WIOA-Policy-400400A-Training-Services?bidId=>.

<sup>5</sup> U.S. Department of Labor. (2024). "Lower Living Standard Income Level Guidelines." Department of Labor. Retrieved May 21, 2024, from <https://www.dol.gov/agencies/eta/llsil>.

## STRATEGIC WORKFORCE DEVELOPMENT PLAN — Existing workforce development resources

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### Independent Training Programs

Several other entities in Flagstaff offer workforce training. Here, we list four that have WIOA-eligible programs.

- Warrior-to-Inspector;
- Northland Hospice and Palliative Care;
- Sedona School of Massage; and
- Kuttz Beauty and Barber College.

### Apprenticeship Programs

Although apprenticeship programs are relatively rare in Flagstaff, two that we identified are through the Northern Arizona Contractors' Association and Boilermakers Western States. The former program is eligible for WIOA funding while the latter is not.

### ARIZONA@WORK Programs

ARIZONA@WORK is the State workforce development network. All services provided through the ARIZONA@WORK are supported by WIOA funding. There are two ARIZONA@WORK Career Centers in Flagstaff and they provide workshops, career fairs and other services. Additional services offered through ARIZONA@WORK include:

- Reemployment services;
- Job training opportunities for adults aged 55 or older;
- Career services for individuals with disabilities; and
- Career services for Native Americans.

### Resources from Nonprofit Organizations

Flagstaff is served by many local nonprofit organizations that engage in workforce development that falls outside the scope of WIOA. Many of these organizations have community partnerships with NAU, CCC and others in a collaborative approach to workforce development. Examples of such nonprofits include:

- ECoNA;
- Greater Flagstaff Chamber of Commerce;
- Local First Arizona; and
- Moonshot.

## STRATEGIC WORKFORCE DEVELOPMENT PLAN — Stakeholder feedback

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As part of the economic development research, Stiletto conducted a survey of the Flagstaff community that included workforce development questions Keen Independent developed. Keen Independent conducted individual interviews and focus groups with stakeholders (detailed in Appendix C), who corroborated much of what members of the public said in the survey.

### Education

Stakeholders described Flagstaff’s workforce as highly educated. This is reflected in the community survey, for which nearly a third of respondents held a master’s degree. However, several interview and focus group participants pointed out that the workforce is “missing that middle ground,” referring to skilled trades workers.

### Challenges

Interview and focus group participants identified several challenges facing Flagstaff’s workforce, including:

- High cost of living;
- Lack of affordable housing;
- Lack of affordable childcare;
- Awareness of workforce development resources;
- Shortage of workers in skilled trades and nursing; and
- Employers struggling with the minimum wage.

### City Role

One of the more common suggestions from stakeholders was for the City to become a leader in workforce development and facilitate dialogue around it. Several interview and focus group participants mentioned the City coordinating with the County on messaging and working with CCC and NAU to offer more WIOA-eligible programs.

*Not everybody has to go to a four-year college. You can get certificates in different areas that are highly needed.*

*City elected official*

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*We get so many people that are really excited about the opportunity work for, work in Flagstaff, they just can't make the numbers work with [the high cost of living].*

*City employee*

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*I'm paying my guys \$40, \$45 an hour and I advertise that ... to look for other mechanics nationwide and I can't get anybody to move here because our rent prices are so high because our housing is so low.*

*Small business owner*

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*I just believe that a lot of people just don't know about all the resources that are available to them.*

*Workforce professional*

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*And I don't see [shortage of skills among] our workforce as being the problem. The problem is minimum wage ....*

*Workforce professional*

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*Maybe the City needs to ... adopt a leadership role within Northern Arizona.*

*Healthcare employer representative*

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*I would like to see us [continue to] be smart about investments in economic development. Growth has been what we've been talking about, but it really means the type of growth that we want.*

*City elected official*

## STRATEGIC WORKFORCE DEVELOPMENT PLAN — Case studies of workforce development

To provide the City with examples of workforce development strategies from other communities, Keen Independent conducted case studies of the following cities:

- Asheville, North Carolina;
- Bend, Oregon; and
- Missoula, Montana.

Communities were selected because they have some similarities to Flagstaff in terms of population, geography and economy. Appendix D provides more detail on each individual city.



### Key Takeaways

Like Flagstaff, Asheville, Bend and Missoula communities with unique cultures and distinct challenges. We noted, however, several commonalities with the workforce development systems in each community.

- Cities themselves do not directly offer full workforce development programs and instead partner with other agencies and organizations to deliver programs and services.
- Local workforce development boards often lead local workforce development and have extensive partnerships with other organizations that act as service providers.
- Local community colleges are instrumental in providing workforce development, such as licensing and certification, soft skills training and industry-specific job training.
- Training programs are often general (internships, soft skills, low-hours certificates, CDL) but workforce development in some communities also invest in workforce for specific industries (OJT) and longer-term training, such as apprenticeship programs.
- Cost of living and housing are concerns in all case study communities. Although such issues go beyond the scope of this report, they greatly impact the workforce and create more urgency to train more residents for living wage jobs.

## STRATEGIC WORKFORCE DEVELOPMENT PLAN — Employment pathways

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Employment pathways look different for job seekers with and without college degrees. We consider both in this section.

### Framing Pathways

Ensuring that residents have opportunities to obtain jobs that allow them to live in Flagstaff should be a top priority of the City. We describe what those pathways may look like for different job seekers in terms of the priority sectors and present additional sectors for consideration.

**Needed annual income.** A single adult with no children needs annual income of more than \$50,000 to support themselves working full-time.<sup>6</sup> Annual median salaries for most jobs included in the employment pathways exceed that amount or are within a few thousand dollars.

**Note on food service workers.** Many of the jobs in the leisure and hospitality industry are in food service. We do not include food service jobs in this plan because our research indicates that additional training is not needed for food service workers, who are available for work but are not earning a living wage. Workforce development training will address little unmet need in terms of preparing food service workers. Many would benefit from upskilling or training for other career paths to better paying jobs.

### Four-Year Degree Pathways

Between NAU and CCC, Flagstaff produces thousands of graduates each year in a variety of fields. Job seekers with four-year degrees and more advanced degrees have options for careers that will earn them a living wage, depending on their field.

**Priority sectors.** The priority sectors with living-wage jobs that require a bachelor's degree (or higher) include astronomy, biomedical and healthcare, and forestry.

**Astronomy.** As NAU and other universities already produce graduates who are prepared to enter careers in astronomy, there is little need for major workforce support from the City of Flagstaff. Potential actions the City could take to support local workers seeking jobs in this sector include promotion of astronomy careers and recognition of the contributions of astronomical research to the community.

**Biomedical and healthcare.** NAU educates students for many types of biomedical and healthcare careers through bachelor's and more advanced degrees. The four-year nursing bachelor's degree program at NAU is WIOA-approved. NAU is working to establish a College of Nursing, which will provide more robust training for students seeking careers in healthcare. The Community College trains students for jobs requiring two-year degrees or certificates and could become a larger training provider for the healthcare sector.

To support job seekers in the biomedical and healthcare sector, the City of Flagstaff and other partners may consider facilitating conversations with local healthcare providers and the Coconino County Workforce Development Board to identify the needs that additional training programs in biomedicine and healthcare could address. Additionally, the City may offer support to CCC and NAU as they work to have more programs approved for WIOA funding.

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<sup>6</sup> Glasmeier, A. (2024). *Living wage calculator for Flagstaff, AZ*. Massachusetts Institute of Technology. <https://livingwage.mit.edu/metros/22380>

## STRATEGIC WORKFORCE DEVELOPMENT PLAN — Employment pathways

**Forestry.** NAU’s School of Forestry offers bachelor’s, master’s and doctoral degrees in forest science. Additionally, the school offers several certificate programs, including Fire Ecology and Management, Forest Resilience and Adaptation, and Natural Resource Management. These programs are not supported by WIOA and the City may consider assisting the County with this process.

**Other options.** The following occupations require a bachelor’s degree or higher and have median salaries above \$95,000:

- Industrial production manager;
- Chief executive;
- Computer and information systems manager;
- Industrial engineer;
- Sales manager;
- Computer network architect;
- Business school professor;
- Computer programmer;
- Lawyer;
- Mechanical engineer;
- Occupational therapist; and
- Physical therapist.

Many of these occupations are management-level positions, which require experience and may benefit from certifications. Job seekers looking to advance to management positions in their field may consider taking certification courses at CCC. The City could engage in dialogue with major employers in various industries to determine what types of training or certification programs would be beneficial for workers looking to advance to management and assess current training offerings for gaps.

5. Median annual earnings of occupations related to astronomy, biomedical/healthcare and forestry in Coconino County, 2022

Occupation	Median annual earnings	Typical education level
<b>Astronomy occupations</b>		
Physical scientist	\$ 102,044	Bachelor's degree
Computer and mathematical occupations	76,190	Bachelor's degree
<b>Biomedical/healthcare occupations</b>		
Biomedical engineer	\$ 165,541	Bachelor's degree
Pharmacist	153,480	Doctoral or professional degree
Physician assistant	129,987	Master's degree
Nurse practitioner	121,009	Bachelor's degree
Medical and health services manager	102,911	Bachelor's degree
<b>Forestry occupations</b>		
Conservation scientists	\$ 75,026	Bachelor's degree
Environmental scientists	63,757	Bachelor's degree

Source: Arizona Commerce Authority, 2022 Occupational Employment and Wages.

## STRATEGIC WORKFORCE DEVELOPMENT PLAN — Employment pathways

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### High School Diploma (or Equivalent) Pathways

Statistically, workers with higher levels of education earn, on average, higher salaries than those with a high school diploma. However, job seekers in Flagstaff have many options, including two-year degree programs, certificate programs and training programs, that will position them to obtain living-wage employment.

**Priority sectors.** The priority sectors with the most opportunity for job seekers with high school diplomas are food processing and manufacturing.

**Food processing.** As food processing occurs in large plants, many of the jobs in this sector fall under manufacturing.

**Manufacturing.** Although manufacturing as a sector is projected to experience a decline in the next 10 years, there is opportunity for Flagstaff to attract more clean manufacturing jobs, and many occupations within the sector will change.

CCC offers a CNC machinist training course to help job seekers in manufacturing stay ahead of automation by learning to service automated machines. Additionally, CCC offers a Certified Manufacturing Engineer course for individuals who have worked at least four years in a manufacturing engineering job. These programs are not supported by WIOA funding. Stakeholders mentioned apprenticeships as helpful in manufacturing. However, formal apprenticeship programs are not widely offered in Flagstaff.

The City may work with the Workforce Development Board and CCC to make the above manufacturing courses WIOA eligible. Additionally, the City can champion apprenticeship programs and promote soft skills and other training courses that may benefit workers as the manufacturing sector becomes increasingly automated.

**Other options.** Construction and transportation are among other sectors that offer job seekers paths to economic self-sufficiency.

**Construction.** Similar to manufacturing, construction can include workers across sectors. On-the-job training was identified by stakeholders as particularly effective for sectors like construction where experience is crucial. The Coconino County Workforce Development Board has funding to support on-the-job training for eligible employers through ARIZONA@WORK. Additionally, CCC offers construction associate's degrees and certificate programs that provide participants with practical experience. Those programs are not supported by WIOA funding, but CCC's HVAC certificate program is eligible.

The City of Flagstaff may consider assisting the County with expanding its allocation of WIOA funding for on-the-job training. The City can build relationships with employers in construction (and other industries) and inform them of the availability of this funding. Then, the City may facilitate the necessary coordination between employers and the County to set up the WIOA-funded on-the-job training program.

**Transportation.** Transportation also supports other sectors. Although college degrees are not required for most transportation occupations, many do have certification requirements. Many stakeholders indicated that CDL-certified drivers are in high demand in Flagstaff. Both NAU and CCC have partnered with industry organizations to offer CDL certificate courses that can be completed within four to six weeks. The CCC program is eligible for WIOA funding support but the NAU program is not (we note that NAU's program is newer).

The City may work with NAU and the County to expedite approval of their CDL programs for WIOA funding support. Additionally, on-the-job training support could benefit employers and workers for other jobs in this sector, so the City may consider facilitating conversations between employers in this sector and the Workforce Development Board.

## STRATEGIC WORKFORCE DEVELOPMENT PLAN — Employment pathways

**Miscellaneous.** Other career opportunities for workers with a high school diploma or equivalent with a median salary of more than \$60,000 per year include the following:

- Supervisor of police and detectives;
- Chef or head cook;
- Supervisor of entertainment and recreation workers;
- Food service manager;
- Lodging manager; and
- Supervisor of firefighters and prevention workers.

As with the college degree pathways to jobs in other sectors that were not identified as priorities for growth, many of these occupations are supervisor-level positions. Thus, workers looking to advance may benefit from skills training courses offered by CCC. Again, the City may consider comparing available training opportunities to skills employers in these sectors cite as required for advancement.

6. Median annual earnings of occupations related to construction and manufacturing in Coconino County, 2022

Occupation	Median annual earnings	Typical education level
<b>Construction occupations</b>		
Supervisors of construction workers	\$ 66,467	HS diploma or equivalent
Construction equipment operators	50,618	HS diploma or equivalent
Construction and building inspectors	56,651	HS diploma or equivalent
Highway maintenance workers	46,226	HS diploma or equivalent
<b>Manufacturing occupations</b>		
Supervisors of production workers	\$ 65,932	HS diploma or equivalent
Machinists	63,070	HS diploma or equivalent
Industrial machinery mechanics	63,417	HS diploma or equivalent
Welders, cutters, solderers and brazers	46,881	HS diploma or equivalent
<b>Transportation occupations</b>		
Transportation, storage and distribution managers	\$ 84,520	HS diploma or equivalent
Supervisors of transportation workers	47,282	HS diploma or equivalent
Heavy and tractor-trailer truck drivers	48,753	HS diploma or equivalent
Light truck drivers	45,909	HS diploma or equivalent

Source: Arizona Commerce Authority, 2022 Occupational Employment and Wages.

## STRATEGIC WORKFORCE DEVELOPMENT PLAN — Summary

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The City of Flagstaff seeks to be more engaged in developing its workforce. The previous sections provided guidance by sector and the present section provides overall guidance for the City.

### City Role in Workforce Development

Most City governments are not directly involved in creating workforce development programs. Rather, they partner with other organizations, including the local workforce development board, to promote programs and services to their residents. The City of Flagstaff may best use its influence and resources to connect workforce development programs and services across institutions and ensure that businesses have a voice in the process.

### Strategic Goals

We propose the following four strategic workforce development goals to the City of Flagstaff:

1. Promote existing programs and pathways to jobs that require four-year degrees and more advanced degrees.
2. Encourage the creation of new certificate programs and training programs that are responsive to market needs.
3. Promote upskilling programs that will allow workers to advance in their careers.
4. Facilitate ongoing conversations with local business representatives and with workers to learn more about and respond to their needs.

The table (P-8) on the following page describes the target population served by each goal, suggested actions that would make progress toward each goal, and a timeframe for implementing each action.

### Integration with Economic Development Strategic Plan

In addition to the primary sectors of focus, the City's Economic Development Strategic Plan, developed by Stiletto, outlines four pillars where recommendations focus:

1. Focus and positioning;
2. Branding and awareness;
3. Sustainable economic development; and
4. Community ecosystem development.

Workforce development integrates horizontally through all pillars. Desired outcomes from the workforce development plan that align with the four pillars include:

- Aligning the talent pipeline to the priority sectors;
- Presenting a clear value proposition for workers, who seek clear information about how to enter and advance in desired careers;
- Presenting a clear value proposition for businesses that want to be sure their needs will be met by the future workforce;
- Ensuring that the talent pipeline evolves to meet future needs of key sectors;
- Developing formal partnerships with the workforce development board, NAU and CCC; and
- Positioning the City as a connector between workforce development resources, businesses and workers.

## STRATEGIC WORKFORCE DEVELOPMENT PLAN — Summary

### 7. Overall goals, suggested actions and timeframe for City of Flagstaff workforce development strategy

Goal	Target population	Sample actions	Timeframe (years)		
			1-2	3-5	6-10
1. Promote existing programs and pathways to four-year+ degree required jobs	Workers with bachelor's degrees or higher	Formalize partnerships with NAU, CCC and FUSD		X	
		Develop a workforce development landing page that describes career pathways		X	
2. Encourage new certificate and training programs	Skilled trade workers	Formalize partnership with Coconino County Workforce Development Board	X		
		Collect data from employers on what types of skills incoming employees need		X	
		Endorse new training programs (e.g., through NAU or CCC) that will lead to a recognizable credential			X
3. Promote upskilling programs	Workers looking to advance/change careers	Formalize partnership with Coconino County Workforce Development Board	X		
		Develop communications strategy around skill-building programs through CCC, CCWDB and others		X	
		Build relationships with nonprofits and community organizations to support ongoing workforce efforts			X
4. Facilitate conversations with businesses to determine needs	All workers	Form business advisory groups to regularly solicit feedback from various sectors		X	
		Encourage local business leaders and workers to serve on County Workforce Development Board			X
		Explore using City BBB funds to support businesses in developing paid internships that are not eligible for WIOA funding due to income eligibility restrictions	X		

## STRATEGIC WORKFORCE DEVELOPMENT PLAN — Additional considerations

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As the City works to implement the recommended workforce development goals, we provide a few additional considerations that will help operationalize workforce development actions.

### Identifying WIOA-Eligible Participants

Although anyone may participate in workforce development programs on the eligible training provider list, only individuals who are identified as low-income may be eligible to have the program cost offset by WIOA funding. The City may consider working with the County and others to identify who may be eligible for WIOA subsidy and find ways to directly provide workforce development resources to them.

For example, Coconino County Health and Human Services may track recipients of social services. The City could work with the County to ensure those individuals know and can access ARIZONA@WORK. Additionally, the City and County may work with state and local workforce development entities to outline automatic eligibility criteria.

### Outlining Partnership Terms

The workforce development strategic plan recommends partnerships with educational institutions, nonprofit organizations and industry entities. We recommend the City develop memorandums of understanding (MOUs) with partners that outline:

- The nature of the relationship;
- Benefits to each party;
- Anticipated outcomes; and
- MOU revision schedule.

The MOUs should be updated and revisited regularly to ensure that the partnership is mutually beneficial and adjust when needed. The City may also consider developing joint MOUs when appropriate (e.g., with multiple educational institutions) that outline how all parties will contribute to workforce development.

### Leveraging Existing Efforts

As mentioned, Flagstaff benefits from many organizations that engage in workforce development. The City may consider ways to leverage existing efforts as it looks to implement the recommended goals. For example, the Greater Flagstaff Chamber of Commerce already convenes business advisory groups and may consider partnering with the City.

### Childcare Workforce

Although childcare was not identified as a primary growth sector in the City's economic strategic plan, Keen Independent heard about rising childcare costs in interviews and focus groups with stakeholders. As the city retains and attracts more residents, a growing need for affordable childcare will affect the workforce. The City may consider ways to ensure that it has a strong early childhood workforce in place.

The National League of Cities has a Cities Supporting the Early Childhood Workforce initiative designed to help cities strengthen their early childhood workforce.<sup>7</sup> The City of Phoenix has participated in this initiative. Leadership from the City of Flagstaff may consider facilitating a conversation with leadership from the City of Phoenix to discuss this initiative, its strengths and how the City of Phoenix has incorporated early childhood workers into its workforce development strategy.

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<sup>7</sup> <https://www.nlc.org/initiative/early-childhood-workforce/>

## APPENDIX A. Labor Market Trends — Introduction

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Keen Independent examined labor market trends and current conditions for the Flagstaff region. This includes:

- Analysis of changes in employment, unemployment, total workers by age and participation in the labor force;
- Types of jobs and industries that comprise the largest share of local employment, now and in the future; and
- Labor force, industry and occupational employment projections, including projected job openings.

The following pages of Appendix A present results of these analyses.

### Methodology

The following section describes the methodology utilized by Keen Independent in its analysis of the Flagstaff labor market.

**Definition of the region.** Federal and state data sources regarding economic and labor force conditions in the Flagstaff area usually only provide data at the county level. Therefore, Keen Independent often had to use data that aggregated all jobs or workers within Coconino County when analyzing conditions in the Flagstaff area.

Based on AZ Commerce Authority July 1, 2023, population estimates, a majority of the residents of Coconino County (approximately 53%), live within the City of Flagstaff and only 11 percent reside in the other incorporated cities in the County. Use of County information is appropriate and relatively accurate for this study.

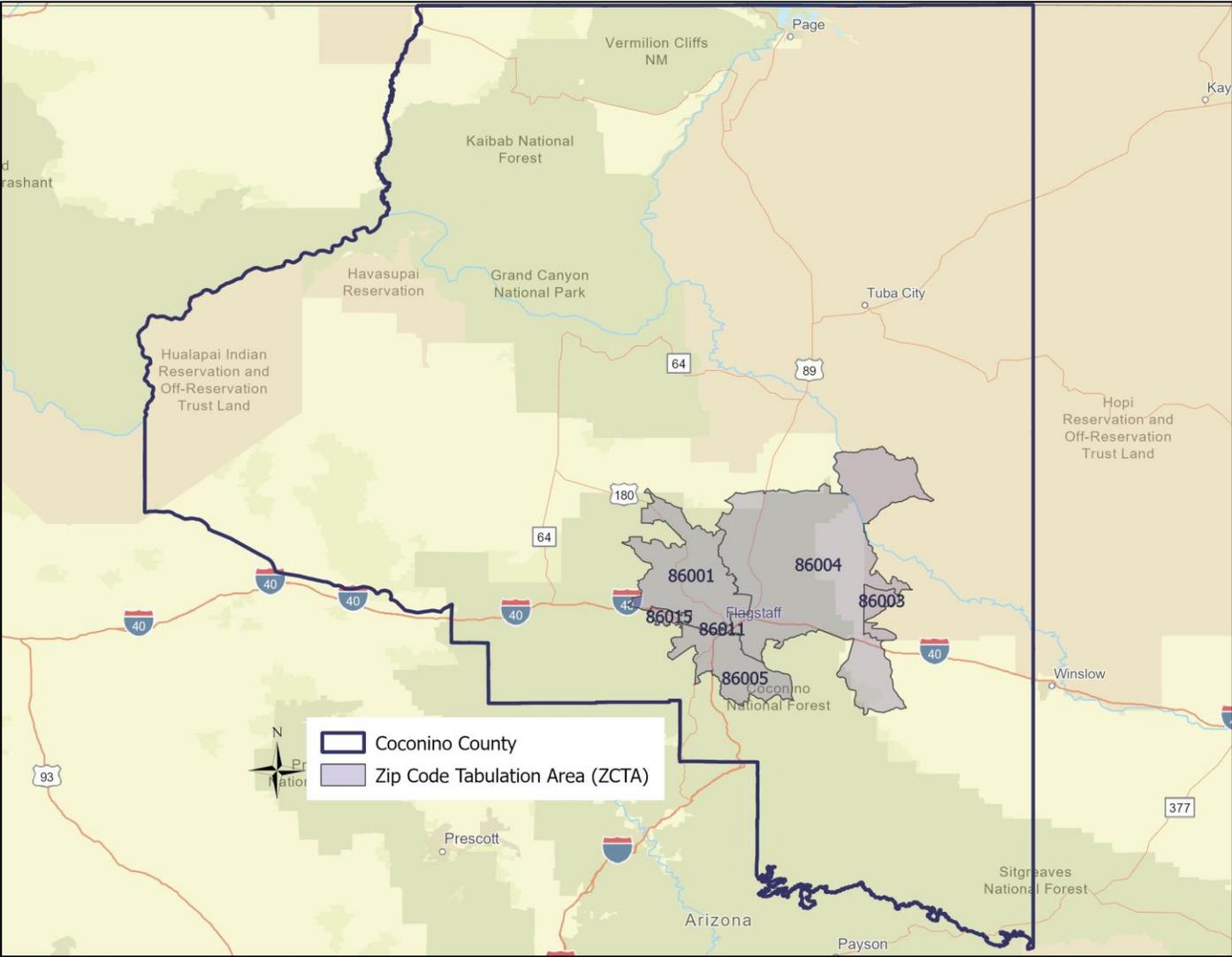
**Data sources.** Keen Independent primarily obtained employment and workforce data from the U.S. Census Bureau ACS 5-Year Estimates and labor market data provided by the Arizona Commerce Authority and Bureau of Labor Statistics (BLS).

### Coordination with Others Performing Economic Research

Concurrent with the Keen Independent study, the City of Flagstaff retained Stiletto, an economic research firm, to develop an economic development strategic plan for the Flagstaff area. Keen Independent consulted with Stiletto professionals, City staff and staff of the Coconino County Workforce Development Board throughout this process.

# A. Labor Market Trends — Introduction

A-1. ZIP codes included in the Flagstaff area



Source: Esri, TomTom, Garmin, FAO, NOAA, USGS, Bureau of Land Management, EPA, NPS, USFWS, Ohio Emergency Management Agency and U.S. Census Bureau shapefiles and basemaps.

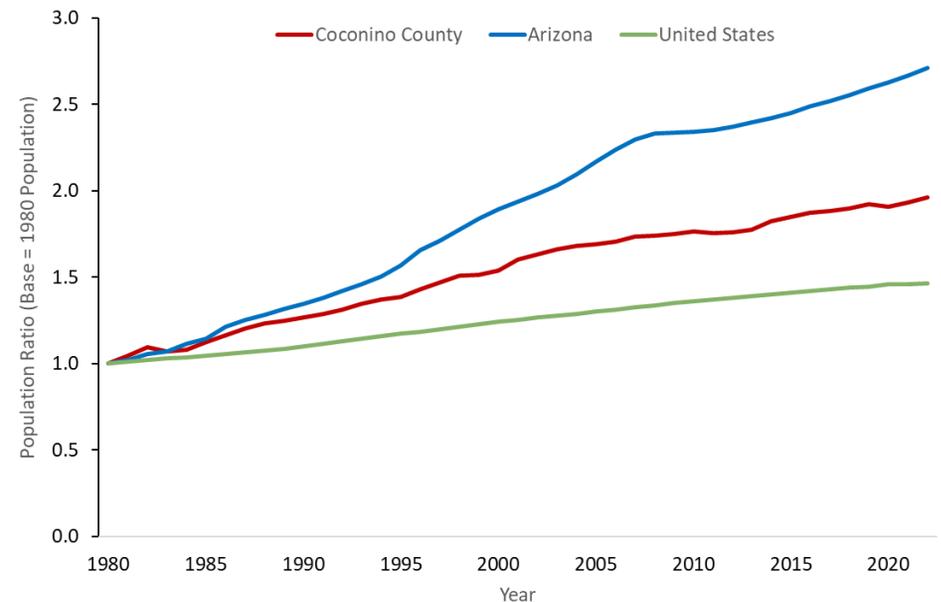
## A. Labor Market Trends — Total population by age

### Coconino County Population Compared to Arizona and the United States

The study team analyzed historical population estimates for Coconino County from the Arizona Commerce Authority from 1980 to 2022 and found that its population has doubled during that time from approximately 76,000 to 150,000. Keen Independent also compared the population growth of Coconino County with that of Arizona and the United States during the same time period. To do so, population ratios were developed using 1980 population levels as the base year for each region. Figure A-2 on the right shows these results.

Results indicate that Arizona’s population has almost tripled since 1980. Coconino County’s population has not grown at the same rate as the state but has increased at a faster rate than the United States as a whole.

A-2. Coconino County, Arizona and U.S. trends in population 1980–2022



Source: Arizona Commerce Authority and World Bank Population Estimates

## A. Labor Market Trends — Total population by age

### Overall Population Growth

The Arizona Commerce Authority developed population projections for Coconino County through 2040. Figure A-3 shows the Medium Series projections, which have county population growing to about 160,000 residents in 2040, up from 150,000 people in 2022. Overall, the county is projected to grow by about 500 residents per year.

Some of this population growth will come from more births than deaths in the county over this period, but much more will come from net in-migration to the county. (In-migration to the county will account for about four times the population change due to births and deaths.<sup>1</sup>)

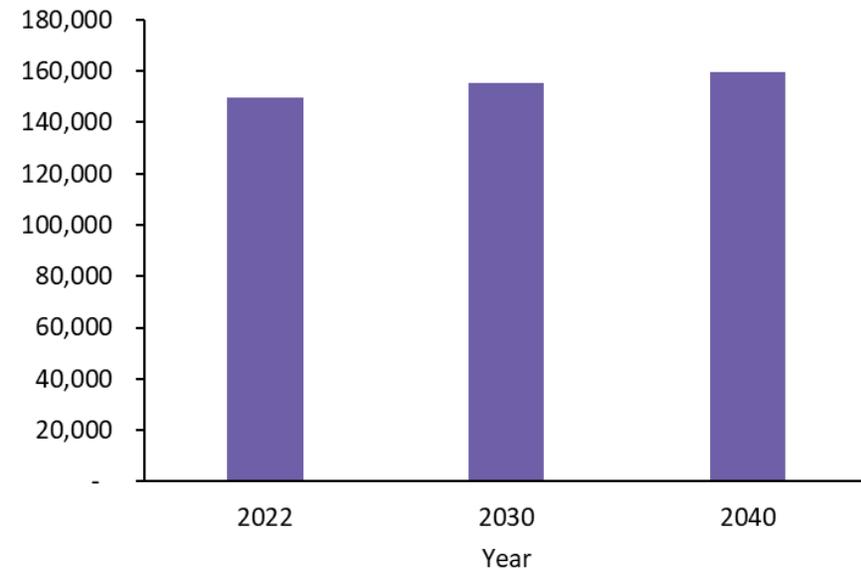
Population in Coconino County has grown more slowly than Arizona as a whole and the State’s projection of continued slow county population growth mirrors past trends. If conditions in the Flagstaff area were to change, there could be an uptick in the rate of population growth.

### Changes by Age Group

Figure A-4 on the following page shows total county population by age group and generational cohort for 2022 and projections for 2030 and 2040 (also come from the Medium Series projections).

Many individuals in the Gen Z population now living in the county, which is college age and other young adults (shown in red in the top graph in Figure A-3), are projected to move out of the county by 2030 (shown in red in the second graph in Figure A-3). This pattern will be repeated by the Alpha generation by 2040, again following past trends.

A-3. Coconino County population projections, 2022, 2030 and 2040

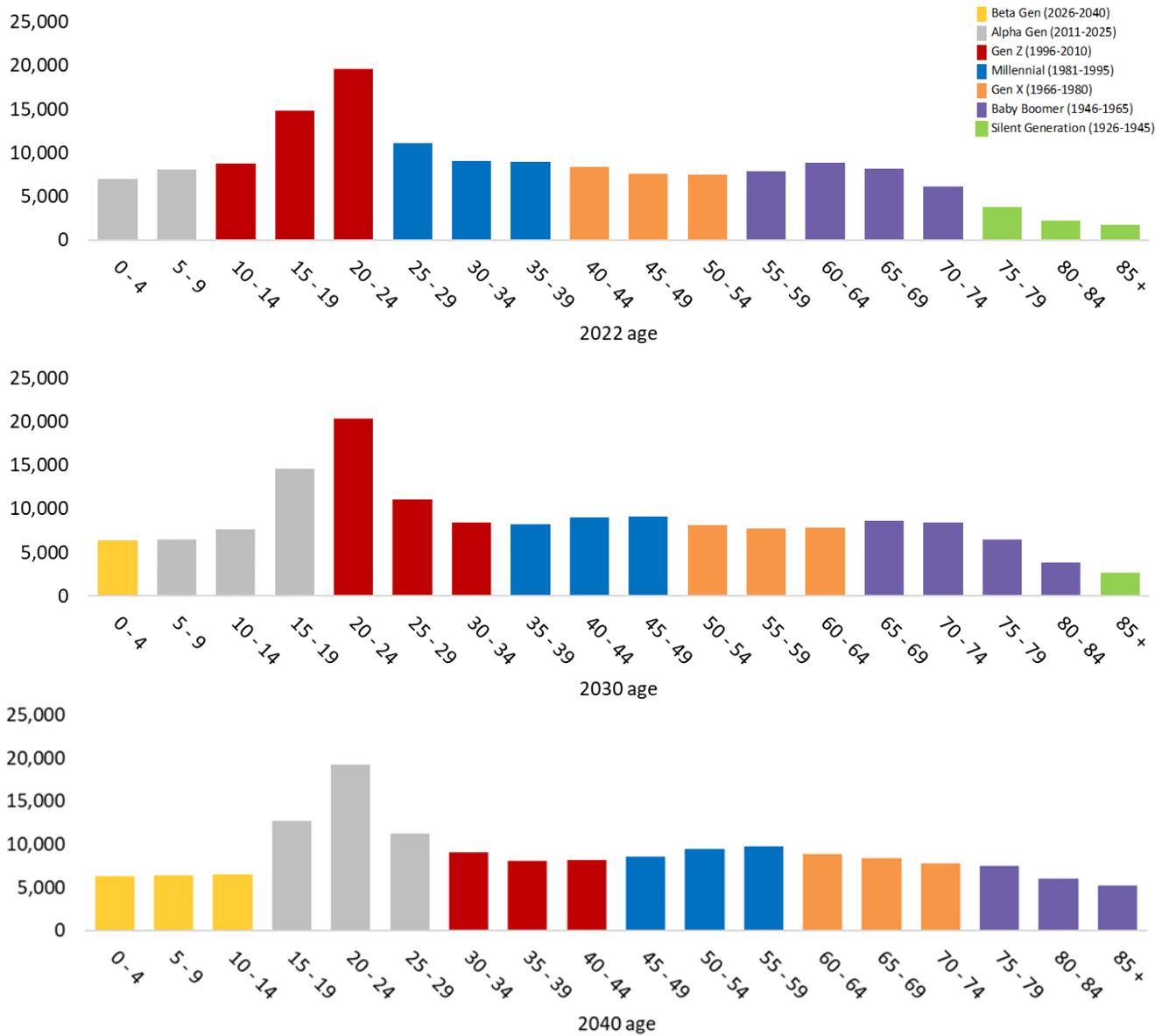


Source: Arizona Commerce Authority Coconino County Medium Series Population Projections

<sup>1</sup> Arizona Commerce Authority Coconino Population Projections Medium Series, Table 1. Total population and components of population change, accessed via: <https://www.azcommerce.com/oeo/population/population-projections/>

# A. Labor Market Trends — Total population by age

A-4. Population by age group and generational cohort, Coconino County, 2022, 2030 and 2040



Source: Arizona Commerce Authority Coconino County Medium Series Population Projections.

## A. Labor Market Trends — Total labor force and employment

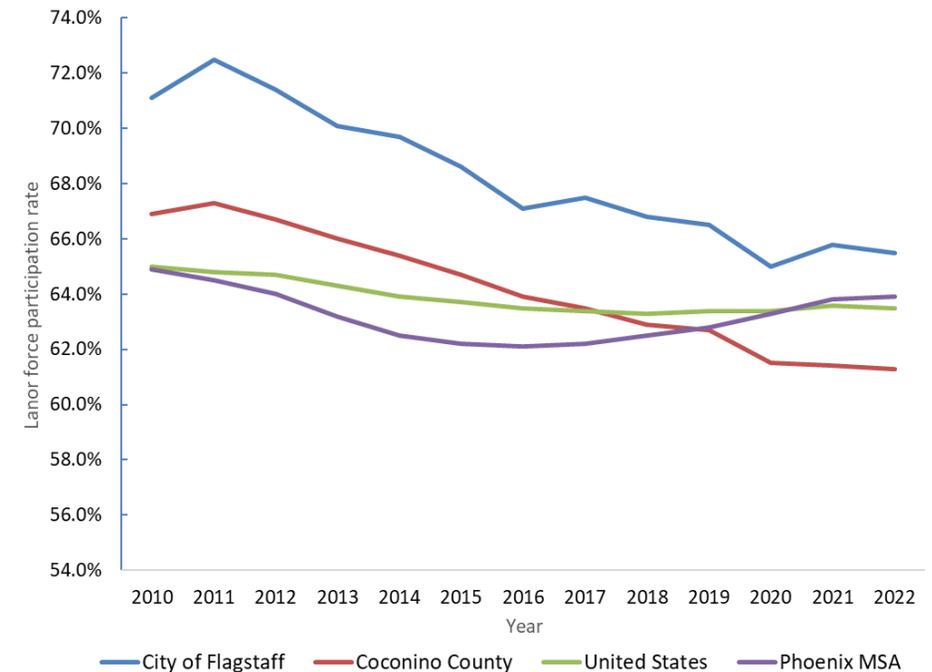
The following sections provide detail on current labor force participation rates and trends within Coconino County.

### Trends in Labor Force Participation Compared to Phoenix MSA and the United States

Keen Independent analyzed labor force participation rates for the City of Flagstaff, Coconino County, Phoenix Metropolitan Statistical Area (MSA) and United States using ACS 5-Year Estimates from the U.S. Census Bureau from 2010 to 2022.

In 2022, the labor force participation rate for people living in the City of Flagstaff and Coconino County were 65.5 percent and 61.3 percent, respectively (compared to 63.9 percent for Phoenix MSA and 63.5 percent of the U.S.). Labor force participation has steadily decreased in the City of Flagstaff over the last decade, but is still higher than the County, the Phoenix MSA and the United States (see Figure A-5). (Note that the 5-year estimates somewhat smoothed out the short-term dip in labor force participation in the COVID-19 pandemic.)

A-5. Labor force participation rates, 2010-2022



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates.

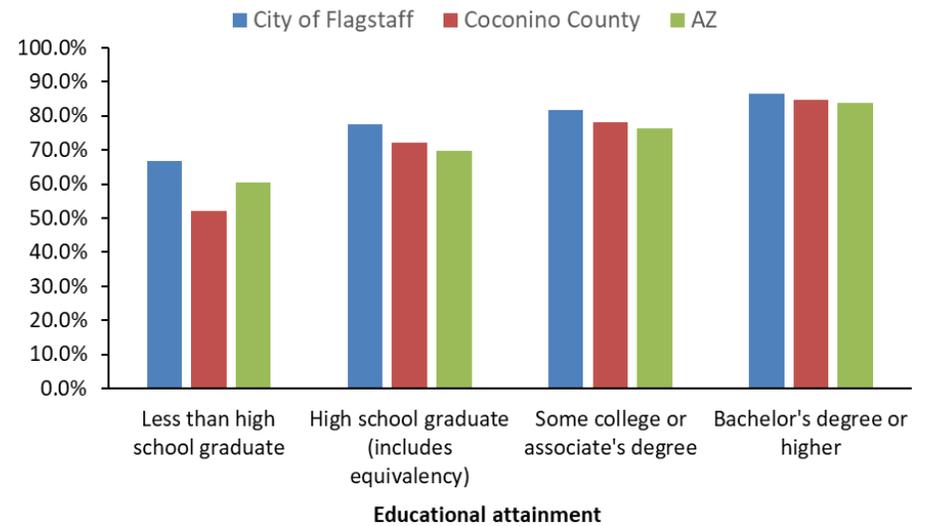
## A. Labor Market Trends — Total labor force and employment

### Labor Force Participation by Educational Attainment

Labor force participation rates are higher for Flagstaff compared with the county and the state. Also, Flagstaff residents in the working age population who had more education had higher rates of participation in the labor force than those with less education.

Figure A-6 examines the labor force participation rates for different groups for the five years before the COVID-19 Pandemic (2015–2019).

A-6. Labor force participation by educational attainment, 2015-2019



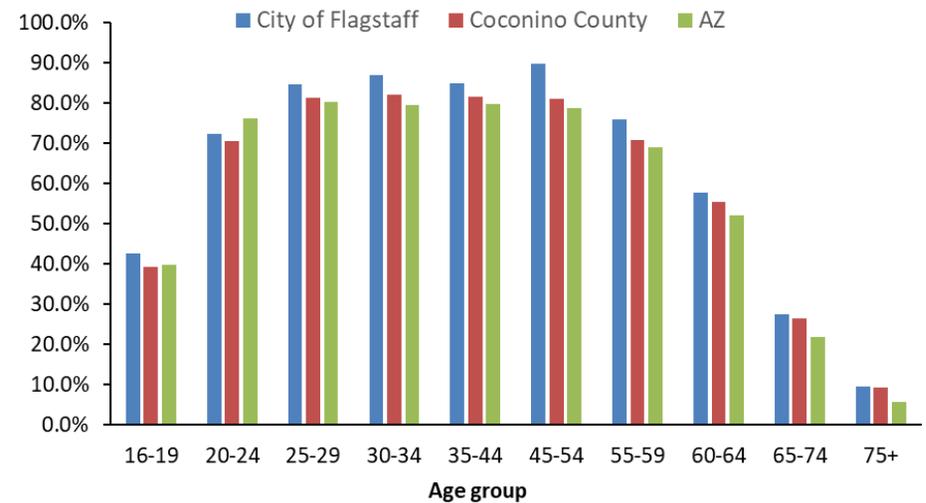
Source: U.S. Census Bureau, American Community Survey 5-Year Estimates 2015-2019.

## A. Labor Market Trends — Total labor force and employment

### Labor Force Participation by Age

In Coconino County the 30-34 age group had the highest labor force participation rate (82%) for 2015-2019. However, individuals 25-54 had very similar participation rates. Participation rates were the lowest for those 19 and under, as well as those 65+. These results were also seen for the City of Flagstaff and the State of Arizona (see Figure A-7).

A-7. Labor force participation by age group, 2015-2019



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates 2015-2019.

# A. Labor Market Trends — Total labor force and employment

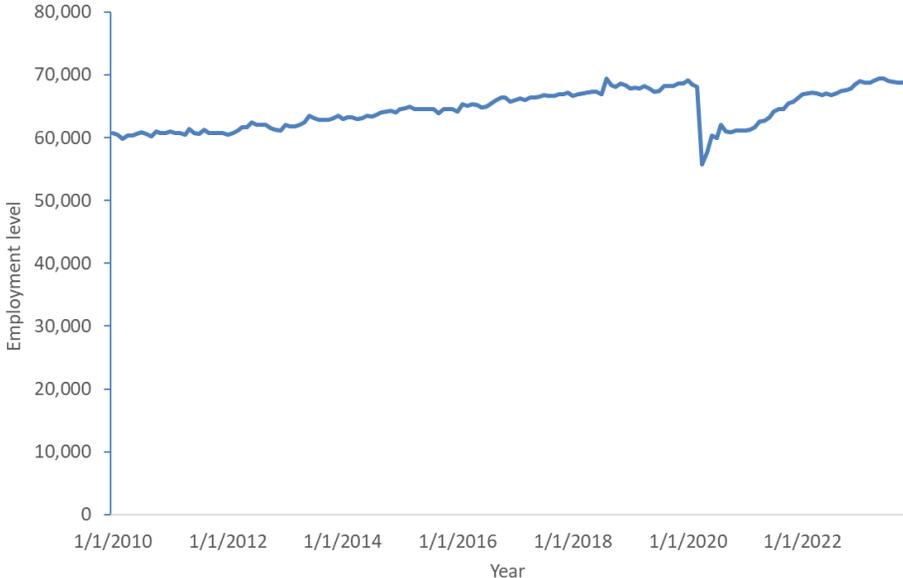
Keen Independent analyzed historical monthly, seasonally adjusted employment levels for Coconino County from 2010 to 2023. The data were sourced from the Arizona Commerce Authority’s employment estimates.

## Trends in Employment in Coconino County

In October 2023, Coconino County had a total employment level of 68,800. Employment has been steadily increasing since spring 2020, reaching levels similar to those before the pandemic.

Figure A-8 shows these results.

A-8. Coconino County employment level (seasonally adjusted), 2010-2023



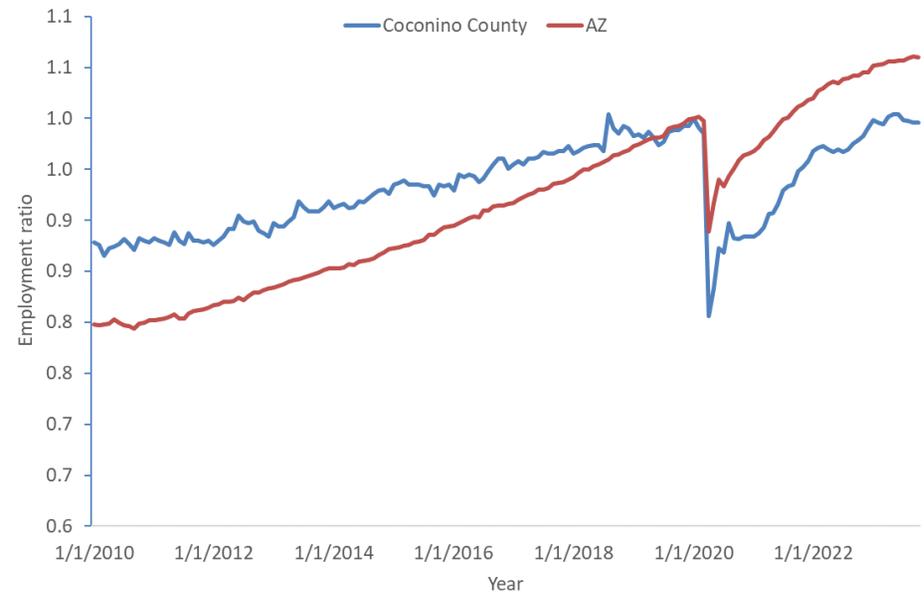
Source: AZ Commerce Authority, Labor Market: Industry Employment and Wages Datasets.

## A. Labor Market Trends — Total labor force and employment

Keen Independent also compared trends in total Coconino County employment to those for Arizona. To do so, Keen Independent calculated a ratio of the employment level for a given month divided by the respective employment in January 2020.

Figure A-9 shows the trend for Coconino County and Arizona employment ratios (with January 2020 equal to 1.0). County employment grew more slowly than the state until spring 2020, and then experienced a much greater relative drop in employment during the pandemic. Statewide employment returned to its pre-pandemic employment levels much more quickly than the county.

A-9. Seasonally adjusted employment ratios (base = Jan. 2020), 2010-2023



Source: AZ Commerce Authority, Labor Market: Industry Employment and Wages Datasets.

## A. Labor Market Trends — Total labor force and employment

Keen Independent analyzed current and projected employment levels by industry. Findings are described in the following pages.

### Current Employment and Employment Projections by Industry Sector

The Arizona Commerce Authority provides current employment levels and projections at the industry level. Keen Independent analyzed the figures from 2022 and compared them to the industry projections for 2032. Figure A-10 shows these results.

In Coconino County in 2022, the following industries had the highest levels of employment:

- Leisure and hospitality (17,131 employees);
- Education and health services (16,661 employees); and
- Trade transportation and utilities (10,200 employees).

These industries accounted for more than one-half of jobs in Coconino County and are also expected to be the biggest industries in 2032. Other industries anticipated to have significant employment increases from 2022 to 2032 are:

- Professional and business services, gaining 1,517 jobs (33% increase); and
- Construction, gaining 639 jobs (21% increase).

Two industries are projected to show job losses: the Self Employed and Government sectors (decreasing by 6.3% and 1.2%, respectively).

A-10. Coconino County 2022 and 2032 employment by industry

Coconino County	2022 Employment	2032 Employment	Percentage change	Numeric change
<b>Industry</b>				
Leisure and Hospitality	17,131	19,120	11.6 %	1,989
Education and Health Services	16,661	18,128	8.8	1,467
Trade Transportation and Utilities	10,200	10,907	6.9	707
Professional and Business Services	4,638	6,155	32.7	1,517
Self Employed	4,568	4,282	-6.3	-286
Government	4,215	4,163	-1.2	-52
Manufacturing	3,482	3,525	1.2	43
Construction	2,983	3,622	21.4	639
Other Services	2,395	2,429	1.4	34
Financial Activities	1,700	1,938	14.0	238
Information	543	646	19.0	103
Natural Resources and Mining	233	286	22.7	53
<b>Total</b>	<b>68,749</b>	<b>75,201</b>	<b>100.0 %</b>	<b>6,452</b>

Source: Arizona Commerce Authority, Employment Industry Projections.

## A. Labor Market Trends — Total labor force and employment

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### Current Employment by Industry Sector in Coconino County Compared to Phoenix MSA

Keen Independent compared the share of jobs in Coconino County by industry to the share in the Phoenix MSA. In the following pages, Figures A-11 and A-12 show the share of employment in each industry for the county and the Phoenix MSA for 2022.<sup>2</sup>

Many of the industries present in the Phoenix MSA are also found in the county. (Analyses later in this appendix show this is also true for specific types of jobs.) However, the relative importance of the sectors differs.

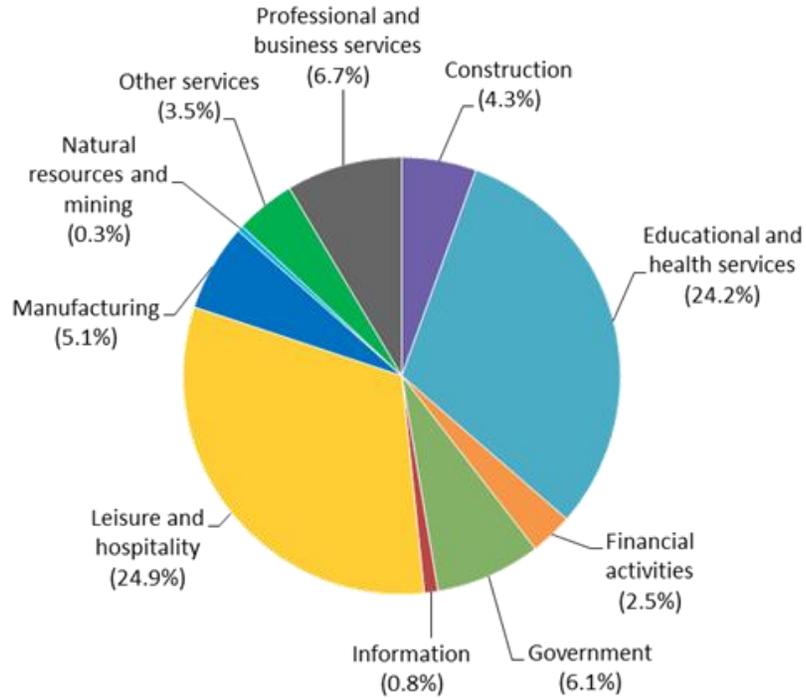
- As mentioned in the previous section, the county’s major industries are leisure and hospitality and educational and health services. The share of the total workforce in these industries in Phoenix MSA is substantially smaller.
- In comparison to Phoenix MSA, the share of the county workforce in Coconino County within the professional and business services, financial activities and construction industries was smaller.

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<sup>2</sup> Arizona Commerce Authority, Employment Industry Projections, accessed via: <https://www.azcommerce.com/oeo/labor-market/employment-projections/>

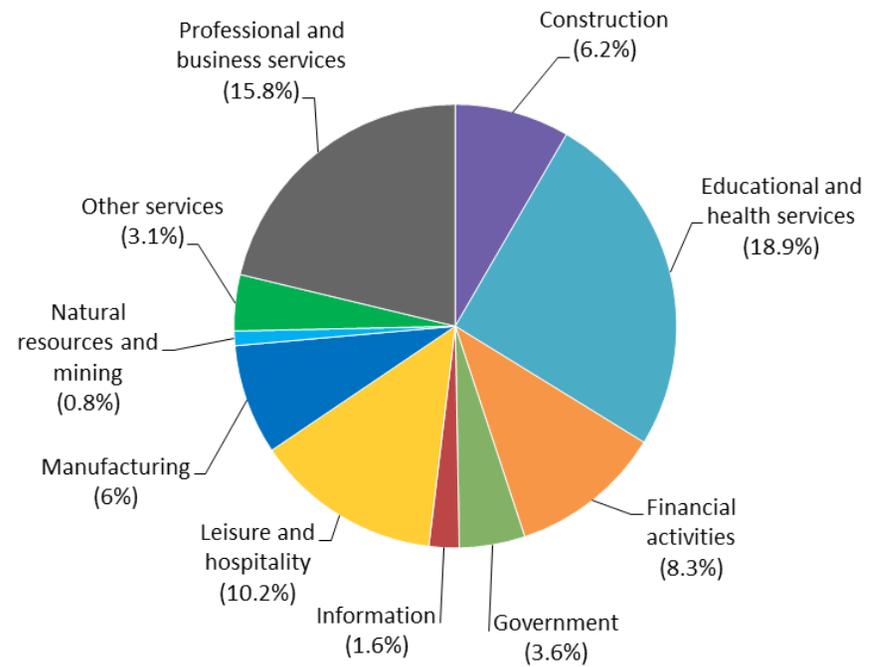
## A. Labor Market Trends — Total labor force and employment

A-11. Coconino County workforce breakdown by industry, 2022



Source: Arizona Commerce Authority, Employment Industry Projections

A-12. Phoenix MSA workforce breakdown by industry, 2022



Source: Arizona Commerce Authority, Employment Industry Projections

## A. Labor Market Trends — Total labor force and employment

### High Location Quotient Industries

Employment Location Quotients (LQs) are a more sophisticated way to compare an industry’s share of total employment in a region to the that for the U.S. For example, if the share of the county’s employment made up by the construction industry was 10 percent and the share of U.S. employment in that same industry was 5 percent, the LQ for that industry for the county would be 2.0. Any ratio greater than 1.0 indicates that the industry has a higher share of employment compared to the U.S.

**Coconino County employment LQs.** Keen Independent analyzed LQs for private sector June 2023 employment from the Bureau of Labor Statistics. For Coconino County, the three highest June 2023 employment LQs were for the following industries:

- Accommodation and food services (ratio of 2.40);
- Arts, entertainment, and recreation (ratio of 2.17); and
- Retail trade (ratio of 1.08).

In comparison to their share of U.S. employment, these industries made up a larger share of Coconino County employment, indicating that the county has a specialization in these industries when compared to the nation (see Figure A-13). All other industries had an LQ below 1.0.

A-13. June 2023 employment LQs by industry, Coconino County

NAICS industry sector	June 2023 employment location quotient
NAICS 11 Agriculture, forestry, fishing and hunting	0.25
NAICS 21 Mining, quarrying, and oil and gas extraction	0.18
NAICS 22 Utilities	0.80
NAICS 23 Construction	0.87
NAICS 31-33 Manufacturing	0.74
NAICS 42 Wholesale trade	0.37
NAICS 44-45 Retail trade	1.08
NAICS 48-49 Transportation and warehousing	0.43
NAICS 51 Information	0.33
NAICS 52 Finance and insurance	0.27
NAICS 53 Real estate and rental and leasing	0.72
NAICS 54 Professional, scientific, and technical services	0.39
NAICS 55 Management of companies and enterprises	0.50
NAICS 56 Administrative and support and waste management and remediation services	0.45
NAICS 61 Educational services	0.43
NAICS 62 Health care and social assistance	0.98
NAICS 71 Arts, entertainment, and recreation	2.17
NAICS 72 Accommodation and food services	2.40
NAICS 81 Other services (except public administration)	0.81

Source: Bureau of Labor Statistics (BLS), Quarterly Census of Employment and Wages Data Viewer

## A. Labor Market Trends — Total labor force and employment

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Keen Independent also reviewed employment levels and projections at the occupation level. Findings are described in the following sections.

### Current Employment and Employment Projections by Occupation

The Arizona Commerce Authority also provides current employment levels, as well as 2032 projections for occupations within the industries mentioned in the previous section.

**Occupational mix.** First, data on employment by occupation shows that the county has most of the same types of jobs found in the Phoenix metro area, but a somewhat different mix of them that follows the differences in share of total employment by industry.

**Occupations projected to have the most growth.** Keen Independent analyzed the 30 occupations that were expected to have the highest percentage change in county employment levels between 2022 and 2032 (see Figure A-14 on the following page). For the county, the occupations with the greatest expected percentage increases were:

- Nurse practitioners (53% increase);
- Personal financial advisors (49% increase);
- Travel agents (42% increase);
- Veterinary assistants (40% increase); and
- Medical and health services managers (39% increase).

In comparison, the expected percentage change in employment for occupations overall was about 9 percent.

Out of the top 30 occupations analyzed, about one-third were part of a healthcare related occupation group. The next most common occupation groups included sales and related occupations, as well as construction and extraction services.

In addition to changes in employment, Keen Independent identified the typical education levels for individuals who were employed in these occupations. Out of the 30 highest-growth occupations:

- About one-third had a current workforce with a typical education level of a bachelor's degree or higher; and
- Approximately one out of five occupations had a current workforce with a typical education level of an associate's degree or a post-secondary non-degree awarded.<sup>3</sup>

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<sup>3</sup> Arizona Commerce Authority, Employment Occupation Projections, accessed via: <https://www.azcommerce.com/oeo/labor-market/employment-projections/>

## A. Labor Market Trends — Total labor force and employment

A-14. Occupations with highest projected employment increases, 2022 to 2032

Coconino County		2022 Employment	2032 Employment	Percentage change	Typical education level
<b>Occupation group</b>	<b>Minor occupation</b>				
<b>Healthcare Practitioners and Technical</b>	Nurse Practitioners	192	293	52.6 %	Master's degree
<b>Business and Financial Operations</b>	Personal Financial Advisors	81	121	49.4	Bachelor's degree
<b>Sales and Related</b>	Travel Agents	83	118	42.2	High school diploma or equivalent
<b>Healthcare Support</b>	Veterinary Assistants and Laboratory Animal Caretakers	50	70	40.0	High school diploma or equivalent
<b>Management</b>	Medical and Health Services Managers	268	372	38.8	Bachelor's degree
<b>Healthcare Practitioners and Technical</b>	Veterinary Technologists and Technicians	87	120	37.9	Associate degree
<b>Food Preparation and Serving Related</b>	Cooks, Restaurant	1,154	1,577	36.7	No formal educational credential
<b>Production</b>	Light Truck Drivers	319	434	36.1	High school diploma or equivalent
<b>Healthcare Practitioners and Technical</b>	Physician Assistants	93	125	34.4	Master's degree
<b>Computer and Mathematical</b>	Software Developers	160	211	31.9	Bachelor's degree
<b>Healthcare Practitioners and Technical</b>	Psychiatric Technicians	89	117	31.5	Postsecondary non-degree award
<b>Installation, Maintenance, and Repair</b>	Telecommunications Equipment Installers and Repairers, Except Line Installers	66	86	30.3	Postsecondary non-degree award
<b>Sales and Related</b>	Insurance Sales Agents	140	180	28.6	High school diploma or equivalent
<b>Farming, Fishing, and Forestry</b>	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	96	122	27.1	No formal educational credential
<b>Construction and Extraction</b>	Electricians	263	332	26.2	High school diploma or equivalent
<b>Healthcare Support</b>	Home Health and Personal Care Aides	1,073	1,338	24.7	High school diploma or equivalent
<b>Construction and Extraction</b>	Brickmasons and Blockmasons	50	62	24.0	High school diploma or equivalent
<b>Business and Financial Operations</b>	Financial and Investment Analysts	64	79	23.4	Bachelor's degree
<b>Community and Social Service</b>	Substance Abuse, Behavioral Disorder, and Mental Health Counselors	158	194	22.8	Bachelor's degree
<b>Healthcare Practitioners and Technical</b>	Speech-Language Pathologists	62	76	22.6	Master's degree
<b>Sales and Related</b>	Demonstrators and Product Promoters	102	125	22.5	No formal educational credential
<b>Healthcare Support</b>	Nursing Assistants	407	497	22.1	Postsecondary non-degree award
<b>Community and Social Service</b>	Healthcare Social Workers	64	78	21.9	Master's degree
<b>Installation, Maintenance, and Repair</b>	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	110	134	21.8	Postsecondary non-degree award
<b>Healthcare Support</b>	Massage Therapists	98	119	21.4	Postsecondary non-degree award
<b>Personal Care and Service</b>	Tour and Travel Guides	389	471	21.1	High school diploma or equivalent
<b>Sales and Related</b>	Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel	299	361	20.7	High school diploma or equivalent
<b>Construction and Extraction</b>	Drywall and Ceiling Tile Installers	58	70	20.7	No formal educational credential
<b>Production</b>	Driver/Sales Workers	308	371	20.5	High school diploma or equivalent
<b>Personal Care and Service</b>	Animal Caretakers	193	232	20.2	High school diploma or equivalent

Source: Arizona Commerce Authority, Employment Occupation Projections

## A. Labor Market Trends — Unemployment

The following sections provide detail on current unemployment rates and unemployment trends for Coconino County.

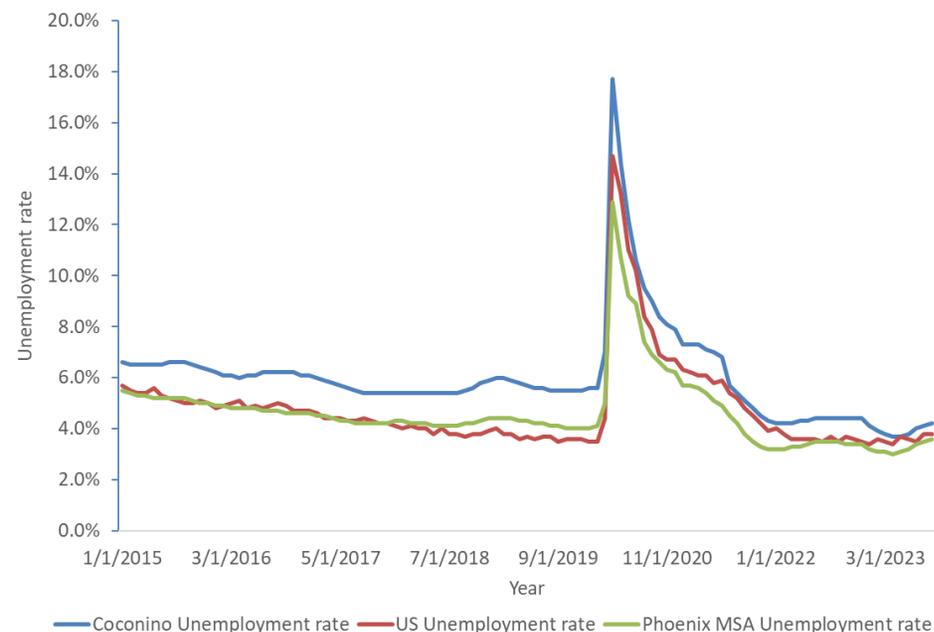
### Trends in Unemployment Compared to Phoenix MSA and the United States

For October 2023, the Arizona Commerce Authority reported an unemployment rate for Coconino County of 4.4 percent. That meant that 4.4 percent of people in the labor force in the county were unemployed in that month (totaling to about 3,400 unemployed individuals). This was higher than the unemployment rate in that month for the U.S. as a whole (3.9%) and the Phoenix metropolitan area (3.7%).

Figure A-15 compares unemployment rates for the county, state and U.S. Unemployment in the county follows statewide and national trends and is usually somewhat higher than the state or nation.

Unemployment in Coconino County (seasonally adjusted) reached 17.76 percent with the COVID-19 pandemic but is now lower than pre-pandemic levels. As shown in Figure A-15, the unemployment rate in the county in 2023 was closer to state and U.S. levels than it was prior to the pandemic.

A-15. Monthly unemployment rate (seasonally adjusted), 2015-2023



Source: Arizona Commerce Authority, Labor Market Unemployment Datasets

## A. Labor Market Trends — Unemployment by group

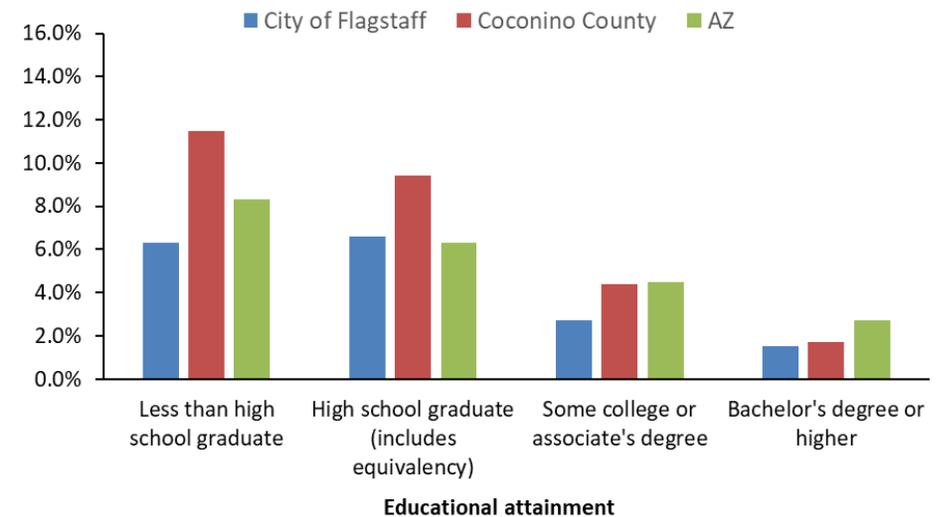
### Unemployment by Educational Attainment

Keen Independent examined the unemployment rates for different groups for the five years before the COVID-19 Pandemic (2015–2019). Figure A-16 presents these results.

Unemployment rates vary considerably for individuals with different levels of formal education:

- About 6 percent of people living in Flagstaff who were in the labor force and had less than a high school education were unemployed, along with 7 percent of the labor force who were high school graduates.
- The unemployment rate for Flagstaff residents was only 3 percent for those with some college education or an associate degree and 2 percent for those with a bachelor’s degree or higher.

A-16. Unemployment rate by educational attainment, 2015-2019



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates 2015-2019

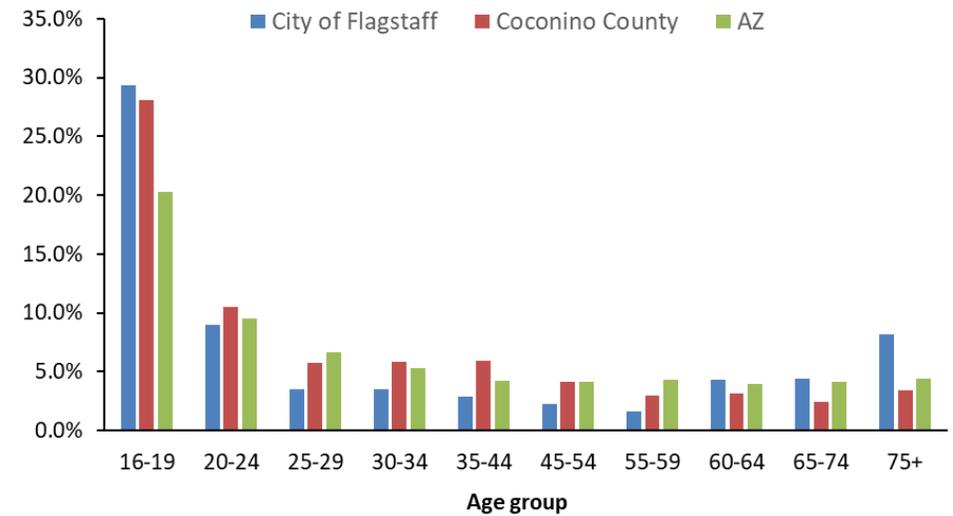
## A. Labor Market Trends — Unemployment by group

### Unemployment by Age

Consistent with differences in unemployment rates by education, the age groups with the highest rates of unemployment in Coconino County for 2015–2019 were those ages 16 to 19 (counting only those in the workforce), dropping substantially for those ages 25 and older.

Figure A-17 provides these comparisons using American Community Survey data for the five years ending in 2019.

A-17. Unemployment rate by age group, 2015-2019



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates 2015-2019

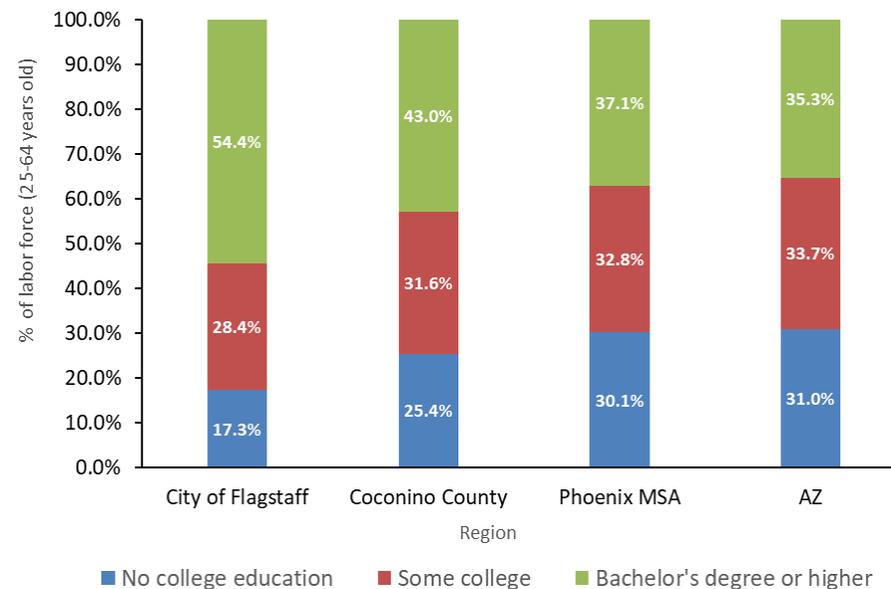
## A. Labor Market Trends — Labor force education

### Educational attainment of the labor force

Keen Independent analyzed the educational attainment of the labor force for residents of Flagstaff, Coconino County, the Phoenix MSA and Arizona. Data from ACS 2018-2022 estimates were utilized to calculate the percentage of the labor force (ages 25-64 years old) that had a bachelor's degree or higher, some college education, or no college education.

The results in Figure A-18 show that workers in Flagstaff and Coconino County (54% and 43%, respectively) had much higher percentages of the labor force with a bachelor's degree or higher than the Phoenix MSA (37%) or Arizona (35%).

A-18. Educational attainment of the labor force (25-64 years old), 2015-2019



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates 2015-2019

## A. Labor Market Trends — Labor force education

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### Fields of Education for Individuals with a Bachelor's Degree

Keen Independent analyzed the fields of education for individuals with a bachelor's degree living in Coconino County compared with those living in the Phoenix metro area. Figures A-19 and A-20 in the following pages show these breakdowns.

The same types of bachelor's degrees found for Phoenix metro area residents are also found in Coconino County, but the distribution differs. In Coconino County, the most common degrees for those with a bachelor's degree were:

- Education (14.7%);
- Business (12.5%); and
- Science and engineering related fields (9.2%)<sup>4</sup>.

In Phoenix MSA, the following fields of education were the largest:

- Business (22.7%);
- Education (12.9%); and
- Science and engineering related fields (10.0%)

The biggest difference in bachelor's degrees was for business, just 12.5 percent of Coconino County residents with a college degree having a business degree compared with 22.7 percent of Phoenix metro area residents with a college degree. Among county residents with a bachelor's degree, only 5.8 percent had a degree in engineering compared with 8.3 percent for the Phoenix metro area.

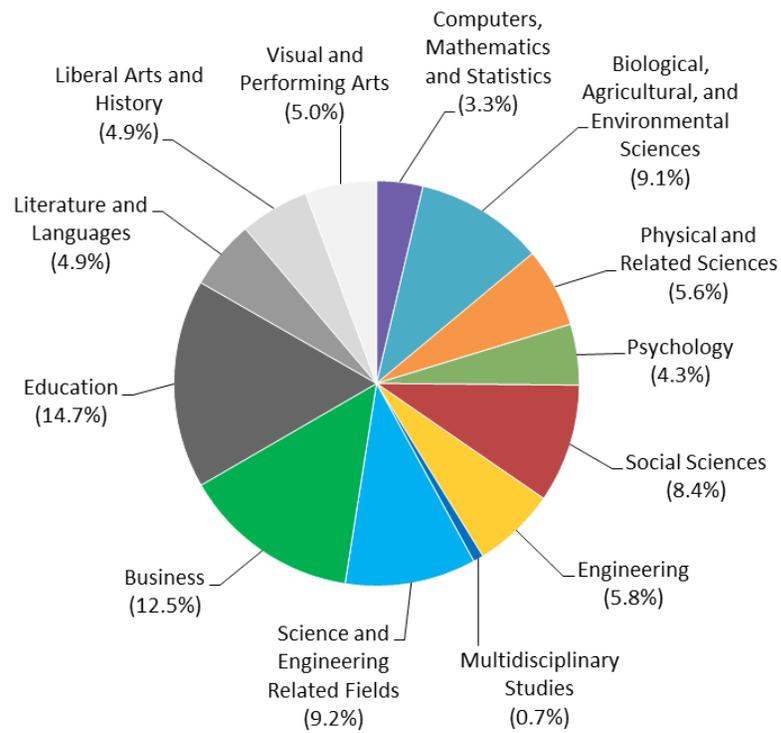
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<sup>4</sup> Science and engineering related fields excludes the following education fields: Computers, Mathematics and Statistics, Biological, Agricultural, and Environmental

Sciences, Physical and Related Sciences, Psychology, Social Sciences, Engineering and Multidisciplinary Studies.

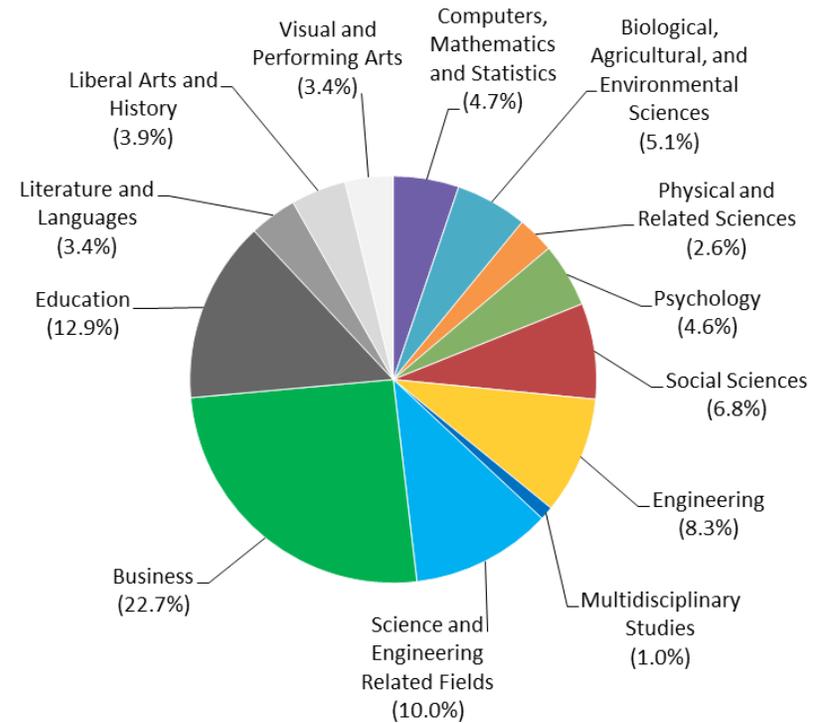
## A. Labor Market Trends — Labor force education

A-19. Fields of education for the population with a bachelor's degree, Coconino County, 2015-2019



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates 2015-2019

A-20. Fields of education for the population with a bachelor's degree, Phoenix MSA, 2015-2019



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates 2015-2019

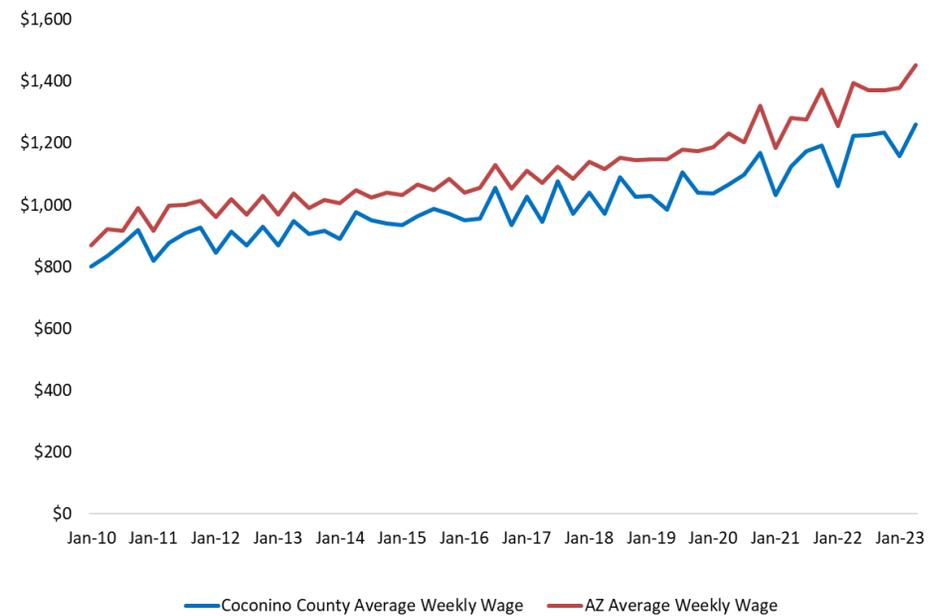
## A. Labor Market Trends — Wage levels of workers

### Trends in Average Weekly Wages for Coconino County Compared to Arizona

In Quarter 2 of 2023, the Arizona Commerce Authority reported a total employment average weekly wage in Coconino County of \$1,260. This was lower than the average weekly wage for Arizona (\$1,454).<sup>5</sup>

Data from 2010 to 2023 show that both the state and county average weekly wages have been steadily increasing. However, Coconino County's average weekly wage has consistently been below those of the state (see Figure A-21).

A-21. Quarterly average weekly wage levels, 2010 to 2023



Source: Arizona Commerce Authority, Industry Employment and Wages: Quarterly Census of Employment and Wages

<sup>5</sup> Note that comparable data for the Phoenix MSA was not available.

## A. Labor Market Trends — Wage levels of workers

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### Weekly Wages by Employment Sector

In addition to overall average weekly wage levels, Keen Independent analyzed wages for individual industries.

The Arizona Commerce Authority provides average weekly wages for industries every quarter. Keen Independent analyzed the available data for Q2 2023.

**Highest weekly wages.** Out of 46 industries reported, the ones with the highest levels in average weekly wages were:

- Insurance carriers and related activities (\$1,970);
- Justice, public order and safety activities (\$1,877);
- Professional and technical services (\$1,690);
- Support activities for transportation (\$1,675); and
- Administration of human resource programs (\$1,483).

**Lowest weekly wages.** The industries with the lowest average weekly wages were:

- Food and beverage stores (\$617);
- Accommodation (\$613);
- Social assistance (\$605);
- Food services and drinking places (\$544); and
- Motion picture and sound recording industries (\$539)

These results for the lowest-wage industries are notable because of the large number of accommodation and food services and drinking places jobs in the county.

Figure A-22 shows the average weekly wages for the 46 industries.

## A. Labor Market Trends — Wage levels of workers

A-22. Average weekly wages by industry, Coconino County, Q2 2023

Industry sector	Industry	Average weekly wage
<b>Finance and insurance</b>	Insurance carriers and related activities	\$ 1,970
<b>Public administration</b>	Justice, public order, and safety activities	1,877
<b>Professional and technical services</b>	Professional and technical services	1,690
<b>Transportation and warehousing</b>	Support activities for transportation	1,675
<b>Public administration</b>	Administration of human resource programs	1,483
<b>Wholesale trade</b>	Merchant wholesalers, durable goods	1,418
<b>Manufacturing</b>	Machinery manufacturing	1,391
<b>Manufacturing</b>	Food manufacturing	1,382
<b>Transportation and warehousing</b>	Truck transportation	1,382
<b>Construction</b>	Heavy and civil engineering construction	1,380
<b>Information</b>	Telecommunications	1,372
<b>Manufacturing</b>	Nonmetallic mineral product manufacturing	1,370
<b>Public administration</b>	Administration of environmental programs	1,365
<b>Utilities</b>	Utilities	1,328
<b>Administrative and waste services</b>	Waste management and remediation services	1,277
<b>Public administration</b>	Executive, legislative and general government	1,238
<b>Retail trade</b>	Motor vehicle and parts dealers	1,220
<b>Arts, entertainment and recreation</b>	Museums, historical sites, zoos, and parks	1,207
<b>Transportation and warehousing</b>	Postal service	1,203
<b>Health care and social assistance</b>	Ambulatory health care services	1,181
<b>Other services, except public administration</b>	Membership associations and organizations	1,130
<b>Construction</b>	Construction of buildings	1,106
<b>Manufacturing</b>	Transportation equipment manufacturing	1,079

Source: Arizona Commerce Authority, Industry Employment and Wages: Quarterly Census of Employment and Wages

## A. Labor Market Trends — Wage levels of workers

A-22. Average weekly wages by industry, Coconino County, Q2 2023 (continued)

Industry sector	Industry	Average weekly wage
<b>Transportation and warehousing</b>	Transit and ground passenger transportation	\$ 1,047
<b>Real estate and rental and leasing</b>	Real estate	1,037
<b>Management of companies and enterprises</b>	Management of companies and enterprises	1,032
<b>Construction</b>	Specialty trade contractors	1,016
<b>Other services, except public administration</b>	Repair and maintenance	986
<b>Wholesale trade</b>	Merchant wholesalers, nondurable goods	897
<b>Transportation and warehousing</b>	Couriers and messengers	881
<b>Educational services</b>	Educational services	869
<b>Manufacturing</b>	Wood product manufacturing	845
<b>Finance and insurance</b>	Credit intermediation and related activities	792
<b>Agriculture, forestry, fishing and hunting</b>	Animal production and aquaculture	776
<b>Administrative and waste services</b>	Administrative and support services	767
<b>Retail trade</b>	Building material and garden supply stores	749
<b>Arts, entertainment and recreation</b>	Performing arts and spectator sports	729
<b>Other services, except public administration</b>	Personal and laundry services	709
<b>Transportation and warehousing</b>	Scenic and sightseeing transportation	661
<b>Arts, entertainment and recreation</b>	Amusements, gambling, and recreation	660
<b>Manufacturing</b>	Beverage and tobacco product manufacturing	628
<b>Retail trade</b>	Food and beverage stores	617
<b>Accommodation and food services</b>	Accommodation	613
<b>Health care and social assistance</b>	Social assistance	605
<b>Accommodation and food services</b>	Food services and drinking places	544
<b>Information</b>	Motion picture and sound recording industries	539

Source: Arizona Commerce Authority, Industry Employment and Wages: Quarterly Census of Employment and Wages

## A. Labor Market Trends — High and low earnings occupations and education

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### High and Low Earning Occupations and the Typical Education Level of the Workforce

Keen Independent also analyzed the 30 highest and lowest annual earning occupations within Coconino County, using 2022 data from the Arizona Commerce Authority.<sup>6</sup> Additionally, data from the Bureau of Labor Statistics was utilized to identify the typical education level needed for entry level of the workforce for each of those occupations.<sup>7</sup> These results are shown in Figure A-23 and Figure A-24 in the following pages.

**Highest earning occupations.** Overall, the top 30 occupations had median annual earnings of \$78,862 or higher. In terms of education, a majority of the 30 highest earning occupations in Coconino County (approximately two out of three) had a typical education entry level of a bachelor's degree. Another one out of four had a typical education entry level of a master's degree or higher and only one out of ten had a typical education entry level of an associate degree or postsecondary non-degree award or lower.

Based on the 2022 earnings data, the seven highest earning occupations were:

- Biomedical engineers (\$165,541 and typical education level of a bachelor's degree);
- Pharmacists (\$153,480 and typical education level of a doctoral or professional degree);
- Physician Assistants (\$129,987 and typical education level of a master's degree);
- Industrial production managers (\$125,337 and typical education level of a bachelor's degree);
- Nurse practitioners (\$121,009 and a typical education level of a master's degree),
- Chief executives (\$119,437 and a typical education level of a bachelor's degree); and
- Natural sciences managers (\$104,416 and a typical education level of a bachelor's degree).

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<sup>6</sup> Arizona Commerce Authority, 2022 Occupational Employment and Wages, accessed via: <https://www.azcommerce.com/o eo/labor-market/occupation-employment/>

<sup>7</sup> Employment Projections program, U.S. Bureau of Labor Statistics, accessed via: <https://www.bls.gov/emp/tables/education-and-training-by-occupation.htm>

## A. Labor Market Trends — High and low earnings occupations and education

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**Lowest earning occupations.** The 30 lowest occupations (in terms of median annual earnings) were those that earned \$30,457 or below. The typical education level for these occupations was generally a high school diploma (or equivalent) or no formal educational credential. Only one out of ten occupations had a higher typical education level, with the highest among those being an associate degree.

The seven lowest earning occupations on the other hand were:

- Tire repairers and changers (\$29,293 and a typical education level of a high school diploma or equivalent);
- Fast food and counter workers (\$29,258 and a typical education level of no formal educational credential);
- Childcare workers (\$29,212 and a typical education level of a high school diploma or equivalent),
- Teaching assistants, except postsecondary (\$29,207 and typical education level of some college);
- Dietetic technicians (\$28,958 and typical education level of an associate degree);
- Recreation workers (\$28,848 and typical education level of a high school diploma or equivalent); and
- Amusement and recreation attendants (\$28,777 and a typical education level of no formal educational credential).

## A. Labor Market Trends — High and low earnings occupations and education

A-23. Highest median annual earnings by occupation, Coconino County, 2022

Coconino County		Median Annual Earnings	Typical Education Level
Occupation Group	Minor Occupation		
Architecture and Engineering Occupations	Biomedical Engineers	\$ 165,541	Bachelor's degree
Healthcare Practitioners and Technical Occupations	Pharmacists	153,480	Doctoral or professional degree
Healthcare Practitioners and Technical Occupations	Physician Assistants	129,987	Master's degree
Management Occupations	Industrial Production Managers	125,337	Bachelor's degree
Healthcare Practitioners and Technical Occupations	Nurse Practitioners	121,009	Master's degree
Management Occupations	Chief Executives	119,437	Bachelor's degree
Management Occupations	Natural Sciences Managers	104,416	Bachelor's degree
Management Occupations	Computer and Information Systems Managers	103,168	Bachelor's degree
Management Occupations	Medical and Health Services Managers	102,911	Bachelor's degree
Life, Physical, and Social Science Occupations	Physical Scientists, All Other	102,044	Bachelor's degree
Architecture and Engineering Occupations	Industrial Engineers	101,016	Bachelor's degree
Management Occupations	Sales Managers	100,861	Bachelor's degree
Management Occupations	Financial Managers	100,563	Bachelor's degree
Computer and Mathematical Occupations	Computer Network Architects	100,554	Bachelor's degree
Education, Training, and Library Occupations	Business Teachers, Postsecondary	98,831	Doctoral or professional degree
Computer and Mathematical Occupations	Computer Programmers	97,708	Bachelor's degree
Legal Occupations	Lawyers	97,681	Doctoral or professional degree
Architecture and Engineering Occupations	Mechanical Engineers	95,784	Bachelor's degree
Healthcare Practitioners and Technical Occupations	Occupational Therapists	95,585	Master's degree
Healthcare Practitioners and Technical Occupations	Physical Therapists	95,585	Doctoral or professional degree
Management Occupations	Human Resources Managers	94,926	Bachelor's degree
Management Occupations	Managers, All Other	94,691	Bachelor's degree
Management Occupations	Marketing Managers	92,526	Bachelor's degree
Protective Service Occupations	First-Line Supervisors of Police and Detectives	90,528	High school diploma or equivalent
Architecture and Engineering Occupations	Civil Engineers	82,638	Bachelor's degree
Management Occupations	Construction Managers	82,009	Bachelor's degree
Transportation and Material Occupations	Commercial Pilots	81,777	Postsecondary nondegree award
Healthcare Practitioners and Technical Occupations	Dental Hygienists	80,210	Associate's degree
Business and Financial Operations Occupations	Compliance Officers	78,891	Bachelor's degree
Legal Occupations	Judges, Magistrate Judges, and Magistrates	78,862	Doctoral or professional degree

Source: Arizona Commerce Authority, 2022 Occupational Employment and Wages

## A. Labor Market Trends — High and low earnings occupations and education

A-24. Lowest median annual earnings by occupation, Coconino County, 2022

Coconino County		Median Annual	Typical Education Level
Occupation Group	Minor Occupation		
Food Preparation and Serving-Related Occupations	Cooks, All Other	\$ 30,457	No formal educational credential
Production Occupations	Butchers and Meat Cutters	30,301	No formal educational credential
Transportation and Material Occupations	Stockers and Order Fillers	30,253	High school diploma or equivalent
Food Preparation and Serving-Related Occupations	Food Preparation Workers	30,189	No formal educational credential
Building and Grounds Cleaning and Maintenance Occupations	Maids and Housekeeping Cleaners	29,991	No formal educational credential
Transportation and Material Occupations	Parking Lot Attendants	29,981	No formal educational credential
Production Occupations	Laundry and Dry-Cleaning Workers	29,976	No formal educational credential
Personal Care and Service Occupations	Nonfarm Animal Caretakers	29,966	High school diploma or equivalent
Construction and Extraction Occupations	Fence Erectors	29,963	No formal educational credential
Transportation and Material Occupations	Automotive and Watercraft Service Attendants	29,950	No formal educational credential
Office and Administrative Occupations	Library Assistants, Clerical	29,896	High school diploma or equivalent
Food Preparation and Serving-Related Occupations	Dining Room and Cafeteria Attendants and Bartender Helpers	29,835	No formal educational credential
Sales and Related Occupations	Retail Salespersons	29,807	No formal educational credential
Healthcare Support Occupations	Home Health and Personal Care Aides	29,718	High school diploma or equivalent
Healthcare Support Occupations	Veterinary Assistants and Laboratory Animal Caretakers	29,701	High school diploma or equivalent
Food Preparation and Serving-Related Occupations	Dishwashers	29,624	No formal educational credential
Education, Training, and Library Occupations	Preschool Teachers, Except Special Education	29,618	Associate's degree
Food Preparation and Serving-Related Occupations	Cooks, Fast Food	29,541	No formal educational credential
Transportation and Material Occupations	Cleaners of Vehicles and Equipment	29,541	No formal educational credential
Sales and Related Occupations	Cashiers	29,537	No formal educational credential
Office and Administrative Occupations	Hotel, Motel, and Resort Desk Clerks	29,453	High school diploma or equivalent
Food Preparation and Serving-Related Occupations	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	29,385	No formal educational credential
Arts, Design, Entertainment, Sports, and Media Occupations	Merchandise Displayers and Window Trimmers	29,332	High school diploma or equivalent
Installation, Maintenance, and Repair Occupations	Tire Repairers and Changers	29,293	High school diploma or equivalent
Food Preparation and Serving-Related Occupations	Fast Food and Counter Workers	29,258	No formal educational credential
Personal Care and Service Occupations	Childcare Workers	29,212	High school diploma or equivalent
Education, Training, and Library Occupations	Teaching Assistants, Except Postsecondary	29,207	Some college, no degree
Healthcare Practitioners and Technical Occupations	Dietetic Technicians	28,958	Associate's degree
Personal Care and Service Occupations	Recreation Workers	28,848	High school diploma or equivalent
Personal Care and Service Occupations	Amusement and Recreation Attendants	28,777	No formal educational credential

Source: Arizona Commerce Authority, 2022 Occupational Employment and Wages

## A. Labor Market Trends — High and low earnings occupations and education

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### High Growth, Moderate Wage Occupations that Do Not Require College Degree

Keen Independent identified 25 occupations in Coconino County for which the Arizona Commerce Authority projected the highest growth rates between 2022 and 2032 that we determined had typical education requirements below a bachelor's degree. Keen Independent then considered corresponding median earnings for each of these occupations. Results are shown in Figure A-25 on the following page.

Occupations with high growth projections, no college degree required and relatively high average wages tend to fall into four general groups:

- Light truck drivers (high growth rate, typical formal education of a high school diploma and median annual earnings of \$45,909);
- Healthcare occupations such as practical and vocational nurses, nursing assistants, psychiatric technicians and pharmacy technicians;
- Construction tradespersons such as electricians, telecommunications equipment installers, masons, HVAC mechanics and installers, and plumbers and pipefitters; and
- Sales representatives in fields like travel, services and insurance.

## A. Labor Market Trends — High and low earnings occupations and education

A-25. High growth occupations with educational requirements below a bachelor’s degree and median annual earnings, Coconino County, 2022 and 2032

Coconino County		2022 Employment	2032 Employment	Percentage change	Median annual earnings	Typical education level
<b>Occupation group</b>	<b>Minor occupation</b>					
<b>Sales and Related</b>	Travel Agents	83	118	42.2 %	\$ 41,930	High school diploma or equivalent
<b>Healthcare Support</b>	Veterinary Assistants and Laboratory Animal Caretakers	50	70	40.0	29,701	High school diploma or equivalent
<b>Healthcare Practitioners and Technical</b>	Veterinary Technologists and Technicians	87	120	37.9	36,691	Associate degree
<b>Food Preparation and Serving Related</b>	Cooks, Restaurant	1,154	1,577	36.7	30,646	No formal educational credential
<b>Production</b>	Light Truck Drivers	319	434	36.1	45,909	High school diploma or equivalent
<b>Healthcare Practitioners and Technical</b>	Psychiatric Technicians	89	117	31.5	45,909	Postsecondary non-degree award
<b>Installation, Maintenance, and Repair</b>	Telecommunications Equipment Installers and Repairers, Except Line Installers	66	86	30.3	45,909	Postsecondary non-degree award
<b>Sales and Related</b>	Insurance Sales Agents	140	180	28.6	38,493	High school diploma or equivalent
<b>Farming, Fishing, and Forestry</b>	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	96	122	27.1	32,209	No formal educational credential
<b>Construction and Extraction</b>	Electricians	263	332	26.2	48,761	High school diploma or equivalent
<b>Healthcare Support</b>	Home Health and Personal Care Aides	1,073	1,338	24.7	29,718	High school diploma or equivalent
<b>Construction and Extraction</b>	Brickmasons and Blockmasons	50	62	24.0	47,578	High school diploma or equivalent
<b>Healthcare Support</b>	Nursing Assistants	407	497	22.1	37,094	Postsecondary non-degree award
<b>Installation, Maintenance, and Repair</b>	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	110	134	21.8	47,714	Postsecondary non-degree award
<b>Personal Care and Service</b>	Tour and Travel Guides	389	471	21.1	30,738	High school diploma or equivalent
<b>Sales and Related</b>	Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel	299	361	20.7	61,376	High school diploma or equivalent
<b>Production</b>	Driver/Sales Workers	308	371	20.5	31,002	High school diploma or equivalent
<b>Personal Care and Service</b>	Animal Caretakers	193	232	20.2	29,966	High school diploma or equivalent
<b>Construction and Extraction</b>	Plumbers, Pipefitters, and Steamfitters	187	224	19.8	49,700	High school diploma or equivalent
<b>Food Preparation and Serving Related</b>	First-Line Supervisors of Food Preparation and Serving Workers	873	1,041	19.2	38,587	High school diploma or equivalent
<b>Healthcare Practitioners and Technical</b>	Licensed Practical and Licensed Vocational Nurses	69	82	18.8	60,518	Postsecondary non-degree award
<b>Healthcare Practitioners and Technical</b>	Pharmacy Technicians	134	159	18.7	39,675	High school diploma or equivalent
<b>Production</b>	Laborers and Freight, Stock, and Material Movers, Hand	649	769	18.5	31,209	No formal educational credential
<b>Production</b>	Stockers and Order Fillers	952	1,124	18.1	30,253	High school diploma or equivalent
<b>Food Preparation and Serving Related</b>	Cooks, Institution and Cafeteria	158	186	17.7	32,994	No formal educational credential

Source: Arizona Commerce Authority, 2022 Occupational Employment and Wages  
Arizona Commerce Authority, Employment Occupation Projections

## APPENDIX B. Workforce Development Programs

In this appendix, Keen Independent provides an overview of workforce development programs and services available to job seekers in the Flagstaff area.

### Introduction

Local schools, agencies and organizations operate a wide range of workforce development programs for Flagstaff residents seeking training, continuing education and other career services. Although the following discussion of programs is not exhaustive, it provides many examples of programs that residents of Flagstaff and Coconino County could access.

Appendix B examines workforce development programs in the Flagstaff and Coconino County areas, grouped into three categories:

- Education programs;
- Independent training programs;
- Apprenticeship programs;
- ARIZONA@WORK programs; and
- Resources from local nonprofits.

We note that ARIZONA@WORK is the statewide workforce development network and at the local level, consists of providers that offer workforce development services. These providers have contracts with the Coconino County Workforce Development Board, which serves as the steward of Workforce Innovation and Opportunity Act (WIOA) funding. Although we present education and independent training programs separately, many also fall into this local network and are supported by WIOA funding (we note which programs are and are not eligible for WIOA funding).



Source: Gary Dee via Wikimedia Commons.

## B. Workforce Development Programs — Education programs

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Several opportunities for education and training in post-secondary settings exist in Flagstaff and Coconino County. Northern Arizona University and Coconino County Community College both offer several programs geared towards adult learners and job seekers.

### Northern Arizona University

Northern Arizona University (NAU) is a four-year public research university based in Flagstaff, Arizona. NAU supports two main workforce development programs: Career Steps and the Educational Opportunity Centers Program. Additionally, two of NAU's bachelor's degree programs are eligible for County WIOA funding.

**Career Steps.** Career Steps are online, self-paced modules that cover career related topics and are available to any NAU student. These modules are connected to Udemy, an online learning website that NAU students have access to for free. All modules that are passed with an 80 percent score or higher will result in a Certificate of Completion for that module. In the past year, over 3,000 students and alumni have engaged with the Career Steps program.<sup>1</sup> Examples of modules include:

- Exploring myths and realities of careers;
- Establishing your professional identity;
- Communicating in the workplace;
- Crafting your resume content;
- Accessing the job market; and
- Formulating interview success strategies.

**Educational Opportunity Centers Program.** The NAU Education Opportunity Centers is a federally funded TRIO program that provides counseling and support to low-income adult participants (age 19 or older) who want to enter or continue a high school equivalent, postsecondary education or a postsecondary credential program.<sup>2</sup> The main NAU Educational Opportunity Centers is located in Flagstaff and primarily serves residents of Coconino, Apache, Navajo, Mohave or Yavapai counties, although NAU statewide locations exist. Provided services include:

- Referrals to local GED preparation classes;
- Career assessment and exploration;
- Scholarship search and application assistance;
- Financial aid counseling; and
- Referrals to community resources.

**WIOA-eligible bachelor's degree programs.** Students working toward bachelor's degrees in NAU's Nursing and Computer Information Technology programs may be eligible to receive funding for their programs through WIOA. ARIZONA@WORK lists these programs on its website as approved for WIOA funding and interested students may verify their eligibility via this website.

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<sup>1</sup> <https://in.nau.edu/career/career-steps/>

<sup>2</sup> <https://in.nau.edu/educational-opportunity-centers/eligibility/>

## B. Workforce Development Programs — Education programs

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### Coconino Community College

Coconino Community College (CCC) is a public community college located in Flagstaff, Arizona. CCC has three locations in Coconino County and serves, on average, 2,500 students per semester. Since its founding in 1991, CCC has served over 75,000 students county-wide.<sup>3</sup> Overall, CCC has 24 programs that are eligible for WIOA funding.

**Small Business Development Center.** The Coconino Small Business Development Center (SBDC) provides counseling, training and resources for small businesses throughout Coconino County at two CCC campus locations, one in Flagstaff and one in Page.<sup>4</sup> Anyone who operates a for profit business or is planning to start a business can register to receive free, confidential business advice from a team of experienced small business experts. Examples of topics the experts can assist with include:

- Business planning;
- Market feasibility and research;
- Start-up guidance;
- Cash flow analysis;
- Identification of potential capital sources;
- SBA Loan Assistance; and
- Diverse business certification.

This program is part of the larger Arizona SBDC Network, a statewide source of assistance for small businesses offered through ten Arizona community college districts, the U.S. Small Business Administration and the U.S. Department of Defense. The AZSBDC Network is fully accredited by the America's SBDC, a national system that connects 63 SBDC networks across the United States.<sup>5</sup>

**CCC2Work – Career and Technical Education Program.** The Coconino Community College's Career and Technical Education program (CCC2Work) provides eight career pathways, many of which are one- or two-year programs that result in an associate degree or a certificate upon program completion.<sup>6</sup> The eight pathways are:

- Business and Accounting;
- Computer and Information Technology;
- Early Childhood Education;
- Fire Science;
- GED Prep and ESL;
- Health Services;
- Public Safety; and
- Skilled Trades.

Two of these pathways (GED Prep and ESL and Skilled Trades) are connected to the next two programs.

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<sup>3</sup> <https://www.coconino.edu/about-us>

<sup>4</sup> <https://www.coconino.edu/sbdc>

<sup>5</sup> <https://azsbdc.net/who-we-are/>

<sup>6</sup> <https://www.coconino.edu/cc2work>

## B. Workforce Development Programs — Education programs

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**Adult Basic Education for College and Careers Program.** CCC's Adult Basic Education for College and Careers Program offers free High School Equivalency test preparation and English as a Second Language (ESL) courses. These courses are offered in multiple modalities, such as in-person classes at four Adult Education sites across Coconino County, synchronous virtual classes and asynchronous self-paced online courses. Courses are open to Coconino County residents who are at least 16 years old and legally present in the United States.<sup>7</sup>

**Workforce Training.** CCC offers a variety of non-credit career courses, meaning the completion of these courses does not apply towards a degree program.<sup>8</sup> Many of these courses do, however, conclude with a certification if all requirements are met. Classes are offered online and in-person. Examples of workforce training opportunities include:

- Class A Commercial Driver's License training;
- Real estate pre-licensing and continuing education courses;
- Certificate for Apartment Maintenance Technician (CAMT) courses;
- Tour guide training; and
- Production assistant training.

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<sup>7</sup> <https://www.coconino.edu/adult-education>

<sup>8</sup> <https://www.coconino.edu/workforce-training>

### Flagstaff Unified School District

Flagstaff Unified School District (FUSD) is a K-12 school district serving more than 9,000 students at 15 schools.<sup>9</sup> FUSD has a College and Career Development Department that ensures students are prepared for their postsecondary plans to enter college or the workforce.

**Career and Technical Education.** The Arizona Department of Education has a Career and Technical Education (CTE) department that provides students with support of their academic and professional careers. FUSD has several partnerships with local colleges and industry enterprises that enrich their CTE. Additionally, FUSD is served by the Coconino Association for Vocations, Industry and Technology (CAVIAT), an overlay district that provides funding for CTE to FUSD and other school districts.

**Dual enrollment.** Through partnerships with CCC and Yavapai College, FUSD offers dual enrollment courses where students can receive college credit while in high school. Offerings include courses in Career and Technical Education. According to FUSD's website, more than 60 percent of their students graduate with college credit due to dual enrollment.<sup>10</sup>

**Work-based learning.** FUSD has opportunities for students to gain real-world job experience through shadowing, tours of workplaces and even internships and apprenticeships.

<sup>9</sup> <https://www.fusd1.org/domain/3>

<sup>10</sup> <https://www.fusd1.org/Page/19729>

## B. Workforce Development Programs — Independent training programs

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Here, we review a few examples of independent training programs offered by smaller schools and other individual organizations.

### Warrior-to-Inspector

Warrior-to-Inspector is a military transitioning Pipeline Integrity Non-Destructive Testing (NDT) trade school and apprenticeship program based in Flagstaff.<sup>11</sup> Veterans and civilians are eligible to apply to the 18-month education and training program. The program provides hands-on experience and combines formal classroom training, indoor simulation training and outdoor structured training. The program does not guarantee job placement upon graduation, but claims that historically, one hundred percent of graduates have found related employment upon graduation.

Pre-requisites for enrollment include competencies in mechanical and communication skills, a high school diploma or equivalent and the ability to meet physical requirements. The total estimated cost for the program is \$32,470 and is eligible for WIOA funding.

### Northland Hospice and Palliative Care

The Northland Hospice and Palliative Care agency in Flagstaff offers a Certified Caregiver Training program. The program is approved by the Arizona Board of Nursing Care Institution Administrators and Assisted Living Managers and successful completion of an approved program is required to earn a Certified Caregiver certificate in Arizona. This six-week program meets the educational requirements to earn the certification and prepares students to take the State Certification exam. Program costs are estimated to be \$1,132, which includes the cost of

the certification exam. Scholarships, grants and WIOA funding are available to reduce the cost of enrollment for eligible students.

### Sedona School of Massage

The Sedona School of Massage offers a five-month, 700-hour massage therapy program that prepares students to take the National Certification Exam and Massage and Bodywork Licensing Exam. The courses cover a range of topics from physiology and kinesiology to business practices. Applicants must have a high school diploma or equivalent. The estimated cost of the program is \$8,000 and no financial aid is currently offered, however, the school does offer no interest payment plans. The curriculum is certified by the Arizona State Board for Private Postsecondary Education and eligible for WIOA funding.

### Kuttz Beauty and Barber College

Kuttz Beauty and Barber College, located in Flagstaff, offers an instructional program that prepares students to earn a cosmetology or barber license in Arizona.<sup>12</sup> Students begin with classroom instruction and are then allowed to begin hands-on training while continuing their coursework. Once all training is completed, students have the classes and practice hours required to take the written and practical exams needed to obtain a cosmetology or barber license. Some classes are available online but practice hours must be completed in person.

The cost of the program is estimated to range from \$26,193 to \$29,826 which includes required supplies, fees and the cost of the licensing exam. Financial aid is available to eligible applicants. Nine of the programs offered at Kuttz are eligible for WIOA funding.

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<sup>11</sup> <https://www.war2in.org/>

<sup>12</sup> <https://www.kuttzbarbershop.com/barber-college>

## B. Workforce Development Programs — Apprenticeship programs

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Two industry-specific apprenticeship programs were found in the Flagstaff area and are discussed in this section.

### **Northern Arizona Electrical Contractors' Association (NAECA) Apprenticeship Program**

The NAECA is a trade association with a mission to further educational training, safety and community within the electrical industry in Northern Arizona. The accredited four-year apprenticeship program prepares apprentices for a career in electrical contracting. Classes associated with the apprenticeship program are taught in-person at Sinagua High School in Flagstaff. The cost of the program is \$895 and it is eligible for WIOA funding.

### **Boilermakers Western States Apprenticeship Program**

Apprentice boilermakers who receive training from the Boilermakers Western States Apprenticeship Program learn about all phases of the erection and repair industry, including reading blueprints, rigging on heavy loads, burning, welding and fabrication of metal parts. Apprentices receive a minimum of 144 hours of classroom training per year, for a total of 576 program hours. Total fees for the program are \$250. The program is not listed as eligible for WIOA funding on the ARIZONA@WORK website.

Those who wish to apply to the program must first complete and pass the required Boilermaker Apprentices online lessons (available online) and must submit a birth certificate and high school diploma or equivalent with their application. All completed applications are entered into a drawing of eligible candidates and randomly picked to participate. Applicants with previous experience or veterans registered with Helmets to Hardhats (a national nonprofit that connects transitioning active-duty military and veterans with training and employment opportunities in construction trades) can increase their chances of being selected by following the procedures to upgrade their status in the Pool of Eligibles. For example, Boilermakers Western States Apprenticeship Program has an agreement with Helmets to Hardhats that 25 percent of placements per drawing will be given to Helmet to Hardhat registered applicants.

## B. Workforce Development Programs — ARIZONA@WORK

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ARIZONA@WORK Coconino County is the local workforce development network with two offices in Flagstaff. The Coconino County Workforce Development Board oversees ARIZONA@WORK services to ensure alignment with local needs and provides support through federal WIOA funding. ARIZONA@WORK services are available at no cost to job seekers and employers across Arizona.

### Career Centers

ARIZONA@WORK Career Centers are designed to provide a multitude of services in one location. There are two career centers in Flagstaff:

- Coconino County Health & Human Services office (2625 North King Street, 2nd Floor Flagstaff AZ 86004); and
- Comprehensive One-Stop at the Department of Economic Security (1701 North Fourth Street Flagstaff AZ 86004).

Examples of services provided include:

- A resource room with computers, printers and other technology needs for job seekers;
- Access to workforce specialists and advisors; and
- Frequent workshops, events and job fairs.

### Senior Community Service Employment Program

The Senior Community Service Employment Program (SCSEP) is a federally funded program, authorized by the Older Americans Act in 1965, that assists low-income, unemployed adults aged 55 and older with job training opportunities that help develop the skills and experience needed to find permanent employment. Enrollment priority is given to members of historically minoritized racial and ethnic groups, limited English speaking individuals and those with greatest economic and special employment needs.<sup>13</sup>

Participants in the program receive work-based job training for an average of 20 hours per week at local nonprofit and public facilities and are paid minimum wage (currently \$17.40 per hour in Flagstaff) through grant sponsored funding. While engaging in these opportunities, participants receive supervised training on developing or improving existing employment skills, accessing educational opportunities and job search skills. Participants also receive an assessment to determine their individual training, support services and employment needs.

The National Indian Council on Aging (NICOA) was awarded additional funding as a set-aside grantee for this program in 1989. NICOA operates in seven states, including Arizona. Individuals of any racial or ethnic background who are eligible to participate in the SCSEP can apply through NICOA.

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<sup>13</sup> <https://des.az.gov/services/older-adults/senior-community-service-employment-program>

## B. Workforce Development Programs — ARIZONA@WORK

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### Phoenix Indian Center

The Phoenix Indian Center has two locations, one in Phoenix and one in Flagstaff. The Flagstaff office is co-located with the Native Americans for Community Action organization, which provides community health resources. The Phoenix Indian Centers provide a range of services, including workforce development. These centers provide training opportunities, career coaching, career forecasting information and employment resources, as well as regularly hosting job fairs and hiring events.

Those interested in receiving services begin by filling out an application and meeting with a Workforce Specialist to determine program eligibility. There is no cost to apply or to participate in the program. Many of the hiring events and some virtual training opportunities are free and available to all.

### Reemployment Services and Eligibility Assessment

The Arizona Department of Economic Security Reemployment Services and Eligibility Assessment (RESEA) program assists those collecting Unemployment Insurance benefits with becoming reemployed. RESEA participants have one-on-one meetings with an assigned workforce specialist and receive assessments, reviews of work search activities and an individualized employment plan.

Participation in this program is mandatory for all selected Unemployment Insurance participants and refusal to participate if selected can result in the suspension of Unemployment Insurance.

### Trade Adjustment Assistance

Another federal program administered by the Arizona Department of Economic Security through ARIZONA@WORK is the Trade Adjustment Assistance (TAA) program. TAA offers training and employment opportunities to those who have lost work due to outsourcing or foreign trade. Services provided to TAA-certified workers may include:

- Access to reemployment services;
- Occupational or on-the-job training;
- Continuing education;
- Income support;
- Wage subsidy for workers 50 years old or older;
- Job search allowance;
- Relocation allowance; and
- Health Coverage Tax Credit.

To participate in TAA, a petition must be filed with the U.S. Department of Labor and the Arizona Trade Coordinator by or on behalf of a group of workers who have lost their jobs as a result of foreign trade.<sup>14</sup> TAA Counselors are available to provide assistance, if needed.

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<sup>14</sup> <https://des.az.gov/services/employment/job-seekers/trade-adjustment-assistance>

## B. Workforce Development Programs — ARIZONA@WORK

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### Vocational Rehabilitation Services

The Vocational Rehabilitation program assists persons with disabilities as they prepare for, enter into or retain employment. The program provides a variety of services, such as:

- Vocational evaluation;
- Job training;
- Job search assistance;
- Job placement;
- Transportation;
- Job site modification; and
- Self-employment and entrepreneurial activities.

Applications can be submitted online or at a Vocational Rehabilitation office. To be eligible for this program, individuals must:

- Have a physical or mental impairment that results in a substantial impediment to employment;
- Require services to prepare for, secure, retain or regain employment; and
- Be able to benefit from the services by achieving employment.

### Disabled Veterans Outreach Program

The Disabled Veterans Outreach Program (DVOP) provides specialized, intensive services to disabled veterans, non-disabled veterans and eligible spouses of veterans with priority given to those who have significant barriers to employment such as homelessness, recent incarceration or not having a high school diploma or equivalent certificate. A federal program that is locally operated by the Arizona Department of Economic Security, DVOP services include:

- Assessments;
- Employment plans;
- Career guidance;
- Referral to supportive services; and
- Connections to job openings.

## B. Workforce Development Programs — Resources from local nonprofits

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Flagstaff is served by many nonprofit organizations that provide workforce support that falls outside of WIOA. Here, we list a few examples of such organizations and provide brief descriptions of their activities and programs that support the local workforce.

We note that, as with other programs listed in this appendix, this list is not exhaustive of nonprofit organizations that provide workforce development, as many organizations offer some sort of career support to their constituents. Rather, it is intended to provide examples for the City as it considers how to aid existing workforce development efforts occurring in the community.

### Economic Collaborative of Northern Arizona (ECoNA)

ECoNA envisions Northern Arizona “as a premier business destination” and “top performing economy” in which businesses grow sustainably.<sup>15</sup> In addition to developing strategy around business attraction and producing reports on the state of the economy in Northern Arizona, ECoNA platforms the workforce development efforts of local agencies and schools. Additionally, ECoNA has partnerships with providers of workforce development programs and services.

### Greater Flagstaff Chamber of Commerce

The Greater Flagstaff Chamber of Commerce was founded in 1891 and continues to champion local businesses and their contributions to the economy.<sup>16</sup> The Chamber’s Education and Workforce Division offers a Skills for Workplace Success program that brings mentors from industry jobs to classrooms to discuss career pathways with students.<sup>17</sup>

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<sup>15</sup> <https://econa-az.com/about-econa/our-services/>

<sup>16</sup> <https://downtownflagstaff.org/go/greater-flagstaff-chamber-of-commerce>

<sup>17</sup> <https://www.flagstaffchamber.com/skills-for-workplace-success/>

Additionally, the Chamber convenes leaders in the business community and regularly solicits their feedback on the most pressing economic issues facing Flagstaff.

### Local First Arizona

Although Local First Arizona is a state-wide nonprofit organization, its mission is to elevate and develop local businesses in Arizona cities like Flagstaff.<sup>18</sup> Local First Arizona provides a search tool for website users to identify local businesses and has several programs and events dedicated to helping small businesses thrive in their local economies. Additionally, Local First Arizona offers services to job seekers looking for local employment opportunities.

**Northern Arizona Good Jobs Network.** A four-year initiative led by Local First Arizona, the Northern Arizona Good Jobs Network is a government-funded effort to support the placement of local talent into local jobs.<sup>19</sup> The initiative brings together local partners from government, industry and nonprofit across sectors to develop training and other resources to upskill local workers.

### Moonshot

Focused on entrepreneurialism, Moonshot strives to develop local talent into local business owners.<sup>20</sup> Moonship provides several opportunities, including pitch contests, direct mentoring and skill-building courses designed to support local entrepreneurs as they develop their businesses.

<sup>18</sup> <https://localfirstaz.com/about>

<sup>19</sup> <https://localfirstaz.com/workforce-development>

<sup>20</sup> <https://www.moonshotaz.com/about.html>

## APPENDIX C. Stakeholder Input

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This appendix summarizes input from Flagstaff area stakeholders regarding the local labor market and workforce development.

### Methodology

Keen Independent conducted interviews and focus groups with Flagstaff stakeholder, which included:

- Local business owners and company representatives;
- City staff;
- Coconino County Workforce Development Board members;
- City of Flagstaff elected officials;
- Higher education administrators (university and community college); and
- K-12 administrators.

**In-depth interviews.** Some of the input discussed in this appendix comes from interviews with 11 individuals. We identified and contacted interviewees based on a list that was provided by the City of Flagstaff. The study team also asked all interviewees if there were others to whom we should speak as part of this assessment and identified other interview candidates from those responses.

All interviews were conducted via Zoom. We used a semi-structured approach in the interviews, providing a framework for discussion and allowing participants to steer the conversation into areas they found relevant or of interest.

**Focus groups.** Keen Independent hosted three virtual focus groups of 10 total individuals knowledgeable about the Flagstaff workforce and workforce development. Like the interviews, these sessions followed a semi-structured format.

### Topics

The interviews and focus groups included the following pre-determined topics as well as general themes that emerged during the discussions with stakeholders:

- Descriptions of the Flagstaff workforce;
- Challenges for employers and employees;
- Existing and desired workforce development services and programs; and
- Ways the City can support the local workforce.

## C. Stakeholder Input — Descriptions of the Flagstaff workforce

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As an introductory exercise, Keen Independent prompted many stakeholders to provide descriptions of the Flagstaff workforce.

### Education

When describing the workforce, many stakeholders centered education as a key feature in Flagstaff due to the presence of high-quality educational institutions like Northern Arizona University (NAU) and Coconino Community College (CCC).

**Culture of four-year college degrees.** A few stakeholders described Flagstaff as a community that prioritizes four-year and advanced college degrees to the detriment of certifications or trade skills.

**Disconnect between educational institutions and employers.** A few stakeholders described how the educational institutions are not able to meet the immediate needs of employers in Flagstaff.

*We've got a lot going on here in terms of research and scientific discovery. I think we have a strong arts and culture ... that I see as complementing the scientific discovery section of our community.*

*City elected official*

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*We're a small town ... with a great university, a great community college. And so, I would say we have a very highly skilled workforce, very educated workforce. But I think we're kind of missing that like middle ground.*

*Higher education professional*

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*Not everybody has to go to a four-year college. You can get certificates in different areas that are highly needed.*

*City elected official*

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*The disconnect in Northern Arizona is that you have a handful of major employers who [have] workforce needs, right? And you have these great educational institutions ... the educators are going to say, "We can do this for you, give us 12 to 18 months." And then the employers are going to say, "No way are we waiting 12 to 18 months. We need this now."*

*Workforce professional*

## C. Stakeholder Input — Descriptions of the Flagstaff workforce

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### Employment

Stakeholders also described their impressions of employment in Flagstaff and previewed a few topics that would later be discussed as barriers for employers and job seekers.

**Worker shortages.** Several stakeholders described the workforce as missing crucial segments, including:

- Workers with specialized skill sets requiring an advanced college degree;
- Workers with specialized skill sets that do not require a college degree; and
- Workers with skill sets in between the highly skilled workers and minimum wage job workers.

**Skill gaps.** Additionally, a few stakeholders mentioned that workers, particularly those concentrated in minimum wage jobs, were lacking in soft skills that could help them obtain and retain employment.

**Limited availability of well-paying jobs.** Many stakeholders mentioned that minimum wage jobs are readily available due to the size of the hospitality industry in Flagstaff, but relatively few job opportunities offer a sustainable wage. A few commented that job training in Flagstaff and Coconino County as a whole is not helping many people obtain careers that offer economic self-sufficiency because there are not many such job options available.

*We're doing well when it comes to the nurses and EMTs and some of these more specific or, needing like a bachelor's degree or above.*

*Higher education professional*

*Within the City, of course, we have a need for more of the trade skills.*

*City employee*

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*I think more than anything, the skills that are lacking are in the soft skills, in the people skills ... how do I fill out a resume? How do I work a computer? How do I log onto a Zoom call? What does public transportation look like? What does childcare look like?*

*Higher education professional*

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*I'm concerned about the growth of the hospitality industry, and I wouldn't be in and of itself, but when compared to all the others, it really concerns me because I think we have so much potential. It's frustrating to see so little growth in some of those areas that could be really creating a lot of great jobs for people.*

*City elected official*

*There's plenty of jobs here. ... There's not a lot of careers here. You have very large pockets of high turnover .... It's hard to invest in because it doesn't lead to any kind of self-sufficiency.*

*Workforce professional*

*I think the training that's available, it's to meet minimal need ... because there's just not many opportunities for careers with sustainability.*

*Workforce professional*

## C. Stakeholder Input — Challenges for employers and employees

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Stakeholders spoke about several challenges that employers, employees and job seekers in Flagstaff face. Many of these challenges are outside the scope of Keen Independent’s study with the City but are important to note.

### Overall Challenges

Many of the workforce challenges stakeholders discussed affect both employers and employees.

**Cost of living.** In every conversation we had, the study team heard about the cost of living as a major challenge (potentially the largest challenge) for both employers and employees in Flagstaff. Stakeholders cited rent, mortgages, and costs of goods and services as having increased substantially in recent years, outpacing what workers earn.

Stakeholders familiar with educational institutions commented that schools’ high graduation rates do not necessarily translate to more workers, since many are priced out by cost of living. A few mentioned large incidents of students moving away from Flagstaff after graduation.

*I know there's a lot of folks who will say, well, you know, the cost of living has increased everywhere. And I think, while that might be true, the problem is very, very acute here in Flagstaff.*

*Higher education professional*

*You know, [people] can make a solid 6 figures here in Flagstaff and struggle or they can go somewhere else where the cost of living is significantly less and make about the same.*

*Higher education professional*

*We get so many people that are really excited about the opportunity work for, work in Flagstaff, they just can't make the numbers work with [the high cost of living].*

*City employee*

*We have a robust sign-on and bonus and relocation program and those initiatives help us bring people in from other states, but shortly after ... they have to rely on the wages that they make no matter what market adjustments we make. We continue to struggle ... with folks who just leave with less than a year of service with us and they just tell us, “I just can't continue living here. I really like it. I love the job. I love the organization. I just can't make it.”*

*Healthcare professional*

*We [NAU] can produce graduates all day long ... [it's] just to come to a point where you know, people can't afford to be here, right?*

*Higher education professional*

*The cheapest house in Flagstaff is like \$1.8 million. A studio apartment is \$2,000. And God forbid you have a kid and you gotta pay childcare. Soon as you [graduate], you leave.*

*Workforce professional*

## C. Stakeholder Input — Challenges for employers and employees

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**Lack of housing.** Relatedly, many stakeholders pointed to the lack of any available housing, affordable or not, in Flagstaff. With limited new construction, incoming workers experience difficulties finding places to live, making it difficult for employers to retain their new hires. A few stakeholders mentioned the influx of second homeowners as a factor contributing to the housing shortage.

**Affordable childcare.** A few stakeholders specifically mentioned affordable childcare as a barrier to employment. One stakeholder moved to Flagstaff from another community that had universal pre-K and was surprised that Flagstaff did not.

**Awareness.** There were many workforce development resources mentioned throughout our conversations with stakeholders. One stakeholder suggested that a potential barrier to self-sustaining employment is the lack of broader awareness of those resources and how to utilize them.

*I would say a big [challenge] is the housing and being able to attract and retain qualified candidates, qualified talent.*

*City employee*

*I'm paying my guys \$40, \$45 an hour and I advertise that, you know, to look for other mechanics nationwide and I can't get anybody to move here because our rent prices are so high because our housing is so low. And you know, that was that's been a common trend here for a long time.*

*Small business owner*

*If I'm not losing people to the restaurant industry I'm losing them to Flagstaff housing.*

*Workforce professional*

*We need all levels of housing and we need to update infrastructure.*

*Workforce professional*

*Tomorrow, I-17 is gonna be a zoo because [Phoenix residents are] all coming up here to go skiing and, by the way, they're all staying in AirBnbs that are all second homes.*

*Higher education professional*

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*Another factor I think that contributes to young families leaving is access to quality and affordable childcare and preschool.*

*K-12 professional*

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*I just believe that a lot of people just don't know about all the resources that are available to them.*

*Workforce professional*

## C. Stakeholder Input — Challenges for employers and employees

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### Challenges for Employers

Stakeholders discussed several challenges that employers in particular face in Flagstaff.

**Minimum wage.** One extremely commonly cited challenge for employers was the minimum wage ordinance. We were told that many businesses have had to close or scale back their operations to afford to pay their workers more.

Entities that are not subject to the minimum wage ordinance are also suffering because they are often unable to compete with service jobs that offer more flexibility and better pay. Participants have observed or heard of workers who elect to take a service job over a government job or a job at an educational institution for this reason.

**Restrictions and fees.** A few stakeholders commented that Flagstaff has many regulations in place that make it difficult for new businesses or industries to establish themselves.

*And I don't see [shortage of skills among] our workforce as being the problem. The problem is minimum wage ... employers are downsizing. They're cutting back, they're trying to do more with less.*

*Workforce professional*

*... with the high minimum wage here in Flagstaff, we compete with people who are saying, like, "Why would I work 12-hour shifts in a hospital taking care of, you know, ill patients when I could go work at Target for the same amount of money?"*

*Healthcare professional*

*There's a number of reasons [employers are] not tapping into any of these training dollars and numbers for trainees are just not there. What I'm seeing from the employer side is they don't have its time or resources to ... access these dollars. Employers are scrambling because they're trying to figure out this last 60-cent increase [in the minimum wage] which started a month ago.*

*Workforce professional*

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*We have really high fees. We just passed a stormwater rate increase that's gonna start being impactful in another year or so ... there's a lot of negatives when an industry is looking to come to Flagstaff.*

*City elected official*

*[The City should look into the] permitting process ... I've heard nightmare story after nightmare story about businesses ... they see all of the hurdles placed in front of them and they're like, "You know what? Check. I'm out of here. I can go to Winslow and not only pay way less money, but they'll give me darn near everything I want."*

*Higher education professional*

## C. Stakeholder Input — Challenges for employers and employees

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**Training and certifications.** When discussing candidate qualifications, some stakeholders mentioned that employers would like to see more workers coming in with job-relevant certifications. Relatedly, a few discussed difficulties with on-the-job training. While larger employers have more resources to get employees up to speed, representatives from smaller businesses cited challenges affording high-quality training required for many new hires.

**Shortage of available workers.** Stakeholders indicated that many industries in Flagstaff are facing worker shortages due to the factors outlined earlier in this section. A few specific industries that participants mentioned as experiencing acute shortages included healthcare (specifically nursing), manufacturing and transportation.

*Some of our more niche positions like our project manager positions, our engineering positions are difficult to fill right now. You know, just those positions that really require a specific skill set or specific certifications.*

*City employee*

*It would be ideal for people to come in with some of these certifications already.*

*City employee*

*I can't afford to teach them [new hires].*

*Small business owner*

*Essentially, we train people to then go somewhere else and find a lower cost of living.*

*City elected official*

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*[We recognize that] nurses, specifically, [are] not just a regional need, but a statewide need.*

*Higher education professional*

*I mean, we have people that are knocking down our door saying we need maintenance [technicians].*

*Higher education professional*

*There is a lot of, internal competition between different agencies ... take CDL drivers, for example ... there's just not enough.*

*Higher education professional*

## C. Stakeholder Input — Challenges for employers and employees

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**Workers leaving.** Stakeholders discussed another factor contributing to workers shortages: many in the existing workforce are leaving Flagstaff for the reasons outlined earlier in this section. This exodus of workers and families has meant a decline in new births in Flagstaff and fewer students in the K-12 school system. Higher education is affected by teachers leaving the profession, as many can earn more in the private sector in their respective fields than they can teaching.

**Land availability.** A few stakeholders commented that businesses are constrained by Flagstaff’s lack of land for development. Due to local ordinances, there is not much land available to be developed, so existing resources must be used efficiently.

*Where is that pipeline of skilled labor that we invest millions of dollars in every year to meet the needs of our vacancies? Where are they going? They're leaving. So even with the best efforts of training in individuals, we'll never meet their needs and the needs that are here.*

*Workforce professional*

*The birth rate is continuing to decrease and so, [K-12] enrollment in the last 4 years has declined 6 percent ... public schools are paid per pupil from the state, so it impacts our overall budget as well.*

*K-12 professional*

*Our teachers are usually in a position where they have been or at least could be making a lot more money [in the industry] than they're making teaching.*

*Higher education professional*

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*Here, we're also constrained by land availability .... We need to be utilizing our scarce available land resources as efficiently as possible.*

*City elected official*

## C. Stakeholder Input — Existing workforce development programs and services

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Keen Independent asked stakeholders to identify existing workforce development programs and services. Many stakeholders highlighted opportunities for improvement of workforce development programs, services and coordination.

### Existing Programs

Stakeholders described several different types of workforce development programs, services and initiatives offered in the community. Note that the goal of this discussion was to provide examples of workforce development programs and services that work well, not to compile a comprehensive inventory of programs and services.

**Educational institution partnerships.** The major educational institutions in Flagstaff serving both K-12 and post-secondary students have formalized partnerships that have created workforce pipelines. Stakeholders discussed the benefits of those partnerships, and many expressed wanting even more joint programming between institutions.

**County partnerships.** A few stakeholders indicated that their institutions partner with Coconino County and receive WIOA funding for some students in workforce development programs.

*[NAU] has a partnership with all of the community colleges around the state ... when somebody applies to NAU, rather than receiving the rejection letter as they used to if they weren't immediately meeting all the requirements, they can enroll directly with [a community college]. As soon as they complete their requirements, they transfer seamlessly into NAU.*

*Higher education professional*

*Compared to much of the state and especially a lot of rural communities, we felt we're in a better position. And we attribute a lot of that to the partnership we have with NAU that provides that pipeline of educators for us ... [we are] able to offer them a contract, you know, even before they're graduating.*

*K-12 professional*

*[CCC has] a really good presence in the high schools too with dual enrollment courses.*

*Higher education professional*

*[NAU] did launch a partnership with Mountain Line and Coconino Community College, so we have our own CDL course that'll come online pretty soon here.*

*Higher education professional*

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*[For] several of our programs ... students can receive WIOA funding and career services through Coconino County. We also partner with the County Workforce Development Board.*

*Higher education professional*

## C. Stakeholder Input — Existing workforce development programs and services

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**Certificate programs.** Stakeholders also discussed traditional certification programs. A few of these programs were identified as highly successful, like the CDL certification program at CCC.

Shorter time to program completion and comparable wages were highlighted among stakeholders as benefits of certificate programs compared to four-year degree programs.

*We have a commercial driver's license program. It is 4 weeks full time. You come in, you leave with your class A CDL. We had 150 people go through the program last year and we have about a 98 percent job placement rate. And good paying jobs, \$50,000 to \$60,000 starting [pay].*

*Higher education professional*

*You don't have to go for 2 years to get a good paying job. This maintenance technician program ... we have two different versions. One's a 7 week in-person, 25 hours per week and then we also have an 11-week hybrid program ... and you get your OSHA 1 card. You get your opportunity to take your EPA 608 which is for refrigerants, like HVAC, and then you have the opportunity to take the National Apartment Association's certificate for apartment maintenance technician.*

*Higher education professional*

*[For] big certifications that are required for a position that candidates may not have, the City will, you know, do our best to help them obtain those certifications by paying for them and helping them through the process.*

*City employee*

## C. Stakeholder Input — Existing workforce development programs and services

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**Expanded programming to meet acute needs.** A few stakeholders commented that their institutions are responding to labor market needs by expanding their workforce programming and services. Healthcare and manufacturing were two industries that stakeholders mentioned as having acute workforce needs in Flagstaff.

Challenges to creating these programs include crafting curriculum that covers an extensive topic in a short period of time.

**Soft skills training.** Several stakeholders mentioned their institutions partnering with businesses and other state and local resources to offer soft skills training. These types of programs include guidance on using computers, resolving conflicts and communicating in the workplace.

*[NAU] recently launched an initiative to create a college of nursing rather than just a school of nursing ... [with the] understanding that the need for health care workforce is ... not going away anytime soon.*

*Higher education professional*

*[Coconino Community College is] in the process of developing a manufacturing program that is gonna go through ... the basic understanding and skills when it comes to manufacturing. That is such a broad, broad, topic that it's hard to go into robotics and machining and PLCs and all these really specific things.*

*Higher education professional*

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*We have had specific businesses that have reached out to us to provide customized training opportunities, not necessarily for any type of certificate, but it might be like an HR department that's really small or once an outside entity to train their employees. So, for example, we've been working with Little America Hotel on conflict resolution, team building, team strengths, communication skills ....*

*Higher education professional*

*[CCC works] with a lot of partners like Coconino County Career Services, DES [Arizona Department of Economic Security], ARIZONA@WORK, The Phoenix. We work with a lot of different entities that provide career services support ... for instance, if somebody comes to us that wants to participate in a program, but ... they have no clue how to use a computer, I'm gonna send them over to Goodwill because Goodwill, I know, does computer literacy courses. We don't offer all of those services, but it's knowing who does and then what capacity.*

*Higher education professional*

## C. Stakeholder Input — Existing workforce development programs and services

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**Internships and apprenticeships.** Although several stakeholders lamented that internships and apprenticeships were not widely offered, some organizations provide one or both and many are looking to expand those programs. Having an educational partner like NAU, CCC or Flagstaff Unified School District can help organizations offering internships and apprenticeships ensure that they have a steady pipeline of participants.

**Upskilling.** A few stakeholders spoke about training up existing workers to fill vacancies within their organizations. One of the major benefits of this approach, as explained by one stakeholder, is that the worker is already in Flagstaff and presumably would not have to face many of the barriers to considering relocation.

*The fire department has a formal program with CCC and NAU both, I believe. ... Basically, they invite students to come shadow at the fire department and participate in some of their physical activity training and all that to see what it's like to be a firefighter and [learn] how they can become a firefighter.*

*City employee*

*I believe Water Services ... has a presence, you know, at the colleges and then the city has an agreement with NAU, regarding internships where all City of Flagstaff internships must be posted on the NAU Handshake website, which is where students can view available internships.*

*City employee*

*Another area that I think is really valuable that we're working toward is apprenticeships, creating paid apprenticeships or working more with employers on that on-the-job training.*

*Higher education professional*

*Last year, we offered our first internships for high school students.*

*K-12 education representative*

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*There's been a large uptick in incumbent worker training for us where employers are just upskilling and reskilling ... those individuals are already here, they're working in the company and we're now helping employers to get additional skills where they're having a hard time finding those skilled laborers in the meantime.*

*Workforce professional*

## C. Stakeholder Input — Existing workforce development programs and services

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### Opportunities for Programs and Services

In their discussions of existing workforce development programs and services, stakeholders highlighted areas where there is room for improvement in efficiency and impact.

**Coordinated services.** One of the most cited opportunities for workforce development programs and services by stakeholders was coordination. Although some stakeholders indicated they have partnerships with other organizations that offer these services and can refer job seekers, many indicated that organizations often do parallel work but do not talk to or coordinate with each other.

**Leveraging the community college.** Many stakeholders mentioned CCC expanding its role to include more vocational training and certificate programs. Additionally, a few stakeholders expressed that having more dual enrollment classes between the high schools and CCC would help build the pipeline of qualified workers in Flagstaff.

*Sometimes, [there is] just a disconnect ... like, DES, ARIZONA@WORK, they often will get people in looking for certain services and maybe not think to send them our way .... And I think that there's also disconnect from our end too of having students that ... need some of those wrap around services that entities like the County [or City] or ARIZONA@WORK offer.*

*Higher education professional*

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*I think there's an opportunity for us to get the short-term trainings into the community college that will meet the needs of healthcare in all of those sectors.*

*Workforce professional*

*I venture to say we [should] do less training and do more work-based learning because there's so much of a need ... so many different varieties of things we just have to meet the needs of right now with the short-term certificate training. And then we just kind of build up our pathways, right?*

*Workforce professional*

*The community college used to think that they were ... a steppingstone to going to [university]. And I think that they can do that still, but I think that they also don't think that they're considered a technical school ... [if they] became both [that would help the workforce] .... I think that we are missing a lot with technical, vocational skills here.*

*City employee*

*We need more community college programs in the healthcare area to be able to offer dual enrollment classes to our students.*

*K-12 education representative*

## C. Stakeholder Input — Ways the City can support workforce development

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Stakeholders offered ideas about how the City can better support workforce development. We note that while some suggestions are relatively straightforward for the City to implement, others might be difficult for the City to undertake or do not fall under the City's jurisdiction.

### Direct Support

Some suggested actions for the City would indirectly support the workforce. There are discussed beginning on page 17.

In the next three pages, we considered stakeholders' suggestions for direct support by the City, including facilitating actions or conversations that relate to workforce and economic development.

**Leadership in the region.** When envisioning how the City can best support workforce development efforts, most stakeholders indicated that the City could take more of a leadership role in the region by shaping conversations around workforce and bringing together representatives from local organizations.

A few stakeholders commented that the City could also make more of an effort to engage the business community when developing workforce strategy. They said that business owners often felt left out of prior efforts.

*Maybe the City needs to ... adopt a leadership role within Northern Arizona.*

*Healthcare employer representative*

*I would say to [the City], they need to find some definitive direction, they need to set the mission and vision.*

*Higher education professional*

*The City and the County could also be presenting that cohesive [narrative and consider] how we might be able to partner [with other entities].*

*City elected official*

*[The City could encourage some] of the larger employers in the City of Flagstaff to join the [County] workforce development board ... so we can make sure we always have funding to meet their needs.*

*Workforce professional*

*We need to come together more and discuss the impacts of decisions that are made over here ... [and then] unintended consequences of attracting a business if we're over here increasing fees or making the process slow for developers.*

*City elected official*

*The business community doesn't feel as well represented [in the dialogue around workforce] as the [general] community does.*

*Healthcare employer representative*

## C. Stakeholder Input — Ways the City can support workforce development

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**Coordination and partnerships.** Coordination of services was another commonly mentioned role the City might play in assisting with workforce development. Even though this role generally falls within the scope of a workforce development board, the City may have opportunities to encourage new programs and partnerships and to foster greater dialogue among key stakeholders.

The concept of more or stronger partnerships was also mentioned. These comments included strengthening existing partnerships (e.g., between the City and the local colleges) and forging new partnerships.

*There needs to be coordination. You know, I think the best the City can do is communicate.*

*Workforce professional*

*[The City does] have some partnerships [with NAU and CCC] in place but, additional [partnerships] would be great or more attention to that would be great.*

*City employee*

*With [the City's] influence, the community college will [add more vocational training programs].*

*Small business owner*

*Maybe [the City] could look at forming partnerships not only [within] this county but other counties and ... broadening their scope ...*

*Healthcare employer representative*

*At times, we maybe forget others that are doing the exact same work and so we're all moving parallel. But we're only getting so far and so if we were able to align all of our resources ... I think we could capitalize more on the resources we have that are somewhat limited in our community.*

*Vocational education representative*

*You know, we have really great organizations that exist in the city that our students aren't even aware of... we would love to see that communication of information where the City is helping us create awareness.*

*Higher education professional*

## C. Stakeholder Input — Ways the City can support workforce development

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**Economic development strategy.** Several stakeholders expressed their perception that the City is overly focused on hospitality and tourism. They might be unaware of broader efforts at the City.

We note that the City is working on a new economic development strategy at the time of the writing of this report.

**Offering internships and apprenticeships.** A few stakeholders indicated that the City has previously offered internships or apprenticeships, but that these programs are not well-established. Stakeholders wanted to see the City actively building a pipeline for its own jobs by working with schools to set up enduring internship and apprenticeship programs.

*Another thing that the City could do and should do is look at diversifying where their attention is paid in terms of economic development. I think the Economic Development team from the City's side is very much focused on that hospitality industry, but I think if they look at, attracting some of these ... high wage industries, you know, advanced manufacturing, for example, I think we'd be doing a lot better.*

*Higher education professional*

*I would like to see us [continue to] be smart about investments in economic development. Growth has been what we've been talking about, but it really means the type of growth that we want.*

*City elected official*

*I think our best bet in the future is to look at what we have available [in terms of infrastructure] and try to get those things filled.*

*City employee*

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*The City did sponsor a couple of our students in conjunction with the National Workforce Alliance. I'd like to see internships and apprenticeships through the City be offered.*

*K-12 education representative*

## C. Stakeholder Input — Ways the City can support workforce development

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### Indirect Support

Many stakeholders mentioned actions the City could take that would indirectly support the local workforce. Even though these suggestions were not focused on workforce training, they may be necessary conditions for building a stronger, sustainable workforce and local economy.

**Housing.** Although housing is not part of what Keen Independent focused on in this assessment, it was top of mind for many stakeholders when discussing workforce challenges. Several commented that the City could best support the workforce through making it easier for more housing to be built in Flagstaff.

Stakeholders with knowledge of the City’s current plans and initiatives indicated that Flagstaff is already taking actions to address the housing crisis, but that there are limits on how much the City can do.

**Minimum wage and voter education.** Stakeholders acknowledged that the minimum wage ordinance was a voter initiative and thus can only be reversed by another voter initiative. Although the City cannot directly change the minimum wage, some stakeholders suggested that the City could engage in more education to inform voters about the effects of these types of initiatives.

*There is nothing that can solve the housing issue like more housing.*

*Higher education professional*

*[The City] could rethink the minimum wage decision. It's creating this wage compression and I think that was maybe another unintended consequence ... what it did to the to the \$20 to \$25 an hour employee that a lot of us rely on.*

*Healthcare employer representative*

*[The City is] working with many nonprofit partners on getting some affordable housing .... We are invested in housing, but there's only so much that the City can do.*

*City elected official*

*We really have to get a big grasp on the housing problem...and I think we need to work with our County on that at a greater level too.*

*City employee*

*In San Diego, there was a cap ... on how much you could raise rent per year. Here, you know, and I'm not a big fan of, "Hey, let's get government [involved]," ... but same time, when I have staff telling me their rent just got doubled, literally doubled .... I don't have a way to [help with] that.*

*Higher education professional*

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*One of the things City leadership could do, and this is both elected and employed City leadership, is do better job of educating the voting public, not just [on minimum wage], but on other initiatives and also provide some much-needed leadership in explaining and taking positions and saying why this will be good or not good for certain things.*

*Healthcare employer representative*

## C. Stakeholder Input — Ways the City can support workforce development

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**Transportation.** One stakeholder mentioned transportation as a barrier for workers with non-traditional jobs. This stakeholder indicated that the City might indirectly help many workers, particularly those in minimum wage jobs, if it worked to extend public transportation hours.

*The City could definitely help ... by extending the bus line [hours]. We clean the bank buildings at 10 o'clock at night ... the bus line is done at 9 p.m.*

*Small business owner*

## APPENDIX D. Case Studies

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This appendix provides an overview of the workforce development resources in three communities identified to serve as case studies for the City of Flagstaff.

### Background

Keen Independent identified potential communities for further research into workforce development strategies that may be instructive to the City of Flagstaff. To be considered, a community needed to meet all or most of the following criteria:

- Has a metro area population size of approximately 50,000 to 300,000;
- Is a high-amenity mountain area community;
- Is located at least 100 miles away from a large metro area (over 1 million in population size);
- Has a university and/or college; and
- Has a strong tourism economy.

**Selections.** With input from the City of Flagstaff, Keen Independent chose the following communities:

- Asheville, North Carolina;
- Bend, Oregon; and
- Missoula, Montana.

### Organization of the Appendix

Major sections of this report appendix are organized by each community identified for case study. For each community, we provide descriptions of the following:

- Community profile, including population size, geography, key industries, cost of living and income;
- Workforce development programs and services offered directly by each City; and
- Workforce development programs operated by partners that work with each City.

Our research was supplemented by brief informational interviews with individuals from these communities who have knowledge of workforce development programs and services.

We note that this appendix is not meant to provide an exhaustive list of workforce development programs and services in each of these communities but rather to provide insight into how other communities with some similar characteristics approach workforce development.

## D. Case Studies — Asheville, NC

First, we describe Asheville, North Carolina, a city that is larger than Flagstaff but has some similar features.

### Community Profile

Located among mountains and rivers, Asheville is a growing city in western North Carolina with a thriving downtown.

- Metro area population: 476,072.<sup>1</sup>
- Geography: Situated near Blue Ridge Mountains.
- Closest metro area with a population of 1 million or more: Charlotte, NC (130 miles).
- Major university/college: University of North Carolina at Asheville, Asheville-Buncombe Technical Community College (A-B Tech).
- Revenue from tourism: \$2.6 billion (2022).<sup>2</sup>

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<sup>1</sup> U.S. Census Bureau (2022). American Community Survey 1-year estimates. Retrieved from Census Reporter Profile page for Bend, OR Metro Area <<http://censusreporter.dokku.censusreporter.org/profiles/31000US11700-asheville-nc-metro-area/>>

<sup>2</sup> Tourism Economics. (2022). *Economic impact of visitors in Asheville 2021*. Asheville Convention and Visitors Bureau. <https://www.ashevillecvb.com/research-reports/>

<sup>3</sup> Hoover, M., Ferguson, S., & Lucy, I. (2023). *Understanding North Carolina's labor market*. U.S. Chamber of Commerce. <https://www.uschamber.com/workforce/understanding-north-carolinas-labor-market>

**Key industries.** Key industries include trade, education and health services, leisure and hospitality, retail, government, manufacturing and trade, transport and utilities.<sup>3</sup>

**Cost of living and income.** The composite cost of living in Asheville is slightly lower than the U.S. average.<sup>4</sup> However, about 40 percent of Western North Carolina residents are spending half or more of their income on housing.<sup>5</sup> Median income in Asheville is just under \$64,000, which is comparable to that of Flagstaff (just under \$66,000).<sup>6</sup>

#### D-1. City of Asheville, North Carolina



Source: Michael Tracey via flickr.

<sup>4</sup> Asheville Area Chamber of Commerce. (2023). *Asheville Metro cost of living*. <https://www.ashevillechamber.org/wp-content/uploads/2024/03/COLI-2024-FS.pdf>

<sup>5</sup> Edmonson, E. (2024, February 1). *UNC Asheville graduate advocates for fair treatment and livable wages for service workers in Asheville*. The Blue Banner. <https://thebluebanner.net/16664/news/unc-asheville-graduate-advocates-for-fair-treatment-and-livable-wages-for-service-workers-in-asheville/>

<sup>6</sup> U.S. Census Bureau. (2022). Population Estimates, July 1, 2022 (V2022) – Asheville city, NC [data table]. QuickFacts <https://www.census.gov/quickfacts/fact/table/ashevillecitynorthcarolina/POP060210>

## D. Case Studies — Asheville, NC

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### City Workforce Programs and Services

With support from Buncombe County and the Asheville City School Foundation, the City of Asheville hosts a leadership academy that provides high school youth with paid summer internship opportunities, community service experience and career literacy courses. A major stated aim of the program is “giving Asheville’s young people the opportunity to stay and work in Asheville.”<sup>7</sup>

In the career workshops, students learn financial literacy and have opportunities to explore different career paths. They are also provided with training in transferable skills that are essential in the workplace. Students are paid while they attend workshops. The program boasts a 100 percent college acceptance rate among participants.<sup>8</sup>

### Workforce Partnerships

The City itself provides limited workforce development programs and instead partners with the local workforce development board and other organizations to promote their services.

**Mountain Area Workforce Development Board and NCWorks.** The Mountain Area Workforce Development Board (MAWDB) serves four counties in North Carolina, including Buncombe County in which Asheville sits. MAWDB allocated WIOA funding to NCWorks Career Centers, which have locations throughout North Carolina, to provide services to job seekers.

At the career centers, NCWorks hosts in-person workshops on topics like networking, social media and resume prep. NCWorks offers soft skills tutorials online that job seekers may use at their leisure either on their own device or at a computer at one of the career centers. Additionally, the career centers host employers each day who can connect with prospective candidates. Many of the centers’ visitors are older workers.

**Service referrals.** NCWorks Career Centers have a WIOA case manager on site who can connect job seekers with funding for training. If an individual indicates they want to return to school for a certification or two-year degree, an on-site representative will connect them with partner A-B Tech. Popular certificate programs that job seekers referred from NCWorks participate in at A-B Tech include nursing (CNA) and truck driving (CDL).

**On-the-job training.** NCWorks also distributes funding for on-the-job (OTJ) training. Industries that most frequently make use of these funds include manufacturing, healthcare, and, to a lesser extent, hospitality and tourism.

**Unemployment assistance.** The career centers also assist individuals whose unemployment insurance income is set to expire. Individuals who have been collecting unemployment for five weeks can see a Reemployment Services and Eligibility Assessment Grants (RESEA) representative who will assist them with making a plan to find employment.

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<sup>7</sup> The City of Asheville. (n.d.). *Community and Economic Development* — CAYLA. <https://www.ashevillenc.gov/department/community-economic-development/economic-development/cayla/>

<sup>8</sup> The City of Asheville. (n.d.). *Community and Economic Development* — CAYLA. <https://www.ashevillenc.gov/department/community-economic-development/economic-development/cayla/>

## D. Case Studies — Asheville, NC

**Goodwill Industries.** The City of Asheville partners with Goodwill Industries, which delivers a variety of workforce development programs and services, including:

- Job training and placement for individuals with disabilities, veterans and formerly incarcerated individuals;
- GED program (in Asheville, via A-B Tech) with subsequent job placement assistance;
- Job readiness and search training (e.g., resume writing, interviewing, computer access); and
- Skill building programs in partnership with the community college system.

Upon visiting or emailing a Goodwill Career Center, job seekers are connected with a Career navigator who will help direct them to the appropriate programs and services, from resume review and job search to job skills training.

D-2. Goodwill Industries Thanksgiving event



Source: Maryland GovPics.

## D. Case Studies — Bend, OR

In this section, we provide an overview of workforce development programs and services in Bend, Oregon.

### Community Profile

The largest city among the Cascade Mountains, Bend is known for its varied outdoor activities for residents and visitors.

- Metro area population: 206,549.<sup>9</sup>
- Geography: Situated near the Cascade Mountain Range.
- Closest metro area with a population of 1 million or more: Portland, OR (163 miles).
- Major university/college: Oregon State University Cascades, Central Oregon Community College.
- Revenue from tourism: \$382 million (2022).<sup>10</sup>

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<sup>9</sup> U.S. Census Bureau (2022). American Community Survey 1-year estimates. Retrieved from Census Reporter Profile page for Bend, OR Metro Area <<http://censusreporter.dokku.censusreporter.org/profiles/31000US13460-bend-or-metro-area/>>

<sup>10</sup> Dean Runyan Associates (2023). *The economic impact of travel in the city of Bend*. [https://www.visitbend.com/wp-content/uploads/2023/05/Dean-Runyan-Bend\\_04182023.pdf](https://www.visitbend.com/wp-content/uploads/2023/05/Dean-Runyan-Bend_04182023.pdf)

<sup>11</sup> City of Bend. (n.d.). *Economic Development*. <https://www.bendoregon.gov/government/departments/economic-development>

<sup>12</sup> Economic Development for Central Oregon. (n.d.). *About Bend*. <https://edcoinfo.com/communities/bend/>

**Key industries.** The major industries in Bend are education and health services, leisure and hospitality, retail trade and professional and business services.<sup>11</sup> Software, bioscience and manufacturing are among the industries in the area that are experiencing significant growth.<sup>12</sup> The City collaborates with groups like Economic Development for Central Oregon to attract businesses and support its local workforce.

**Cost of living and income.** Overall, the cost of living in Bend is about 11 percent higher than the national average.<sup>13</sup> The median household income in Bend is nearly \$17,000 more than that of Flagstaff (approximately \$83,000 compared to \$66,000).<sup>14</sup> Affordable housing is a challenge as demand continues to outpace supply.<sup>15, 16</sup>

D-3. Cascade Mountains near Bend, Oregon



Source: Andy Melton via flickr.

<sup>13</sup> Economic Research Institute (2024). *Cost of living data in Bend, Oregon, United States*. <https://www.erieri.com/cost-of-living/united-states/oregon/bend>

<sup>14</sup> U.S. Census Bureau. (2022). Population Estimates, July 1, 2022 (V2022) — Bend city, OR [data table]. QuickFacts. <https://www.census.gov/quickfacts/fact/table/,bendcityoregon,US/PST045222>

<sup>15</sup> *What's to blame for Central Oregon's sky-high cost of living?* (2023, September 7). Central Oregon Daily News. [https://www.centraloregondaily.com/archives/central-oregon-daily/whats-to-blame-for-central-oregons-sky-high-cost-of-living/article\\_405e7390-cd08-576d-9bde-ebd70b6e024d.html](https://www.centraloregondaily.com/archives/central-oregon-daily/whats-to-blame-for-central-oregons-sky-high-cost-of-living/article_405e7390-cd08-576d-9bde-ebd70b6e024d.html)

<sup>16</sup> Bend Chamber (2024). *Bend Chamber Workforce Housing Initiative*. <https://bendchamber.org/workforce-housing-initiative/>

## D. Case Studies — Bend, OR

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### City Workforce Programs and Services

The City of Bend has a strategic objective to “grow and develop a talented workforce.”<sup>17</sup> The City leverages its partnerships with the workforce development board and others to deliver programs and services to local job seekers.

### Workforce Partnerships

Job seekers in Bend are served by the local workforce development board, which has additional partners to deliver programs and services.

**Workforce development board.** Bend is served by East Cascades Works (EC Works), the workforce development board that serves 10 counties in Central Oregon. The priorities of EC Works are aligned with that of the State Workforce and Talent Development Board and include:

- Better integrating the K-12 education system into the workforce system;
- Investing in resources that allow for work-based learning; and
- Closing the opportunity gap in access to training, education and job placement services.<sup>18</sup>

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<sup>17</sup> City of Bend. (n.d.). *Economic Development*.

<https://www.bendoregon.gov/government/departments/economic-development>

<sup>18</sup> East Cascade Works, (2024). *Workforce Innovation and Opportunity Act Local Plan: East Cascades Workforce Area*.

**Mobile workforce development services.** Recognizing that access to workforce development services can be difficult for job seekers, in 2024 EC Works partnered with the Central Oregon Intergovernmental Council to purchase and staff a mobile WorkSource Unit (WSU). The WSU will prioritize visits to remote areas of Central Oregon, bringing programming like hiring events to individuals who have historically had less access to career centers.

**Central Oregon Community College.** EC Works has a partnership with Central Oregon Community College (COCC) as a provider of career and technical education and training. COCC operates a Center for Business, Industry and Professional Development through which job seekers can:

- Prepare for licensing and certification exams, such as those needed to become contractors, tax consultants, pesticide applicators, property managers and real estate brokers;
- Learn program-specific skills (e.g., Microsoft Excel, QuickBooks, Adobe Creative Cloud); and
- Take a general skill building course in areas like digital marketing, data analytics and cybersecurity;

COCC has previously offered pre-apprenticeship programs in industries like construction but no current programs like this are offered.

<https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:1b5d9be4-8b4b-4465-a3d1-0632a42ae096>

## D. Cast Studies — Missoula, MT

Keen Independent also reviewed workforce development in Missoula, Montana, another similar western community.

### Community Profile

A historic trading post, Missoula is a city where arts, culture and the outdoors attract new residents and visitors. The city's visitor's bureau describes Missoula as a multifaceted regional destination with a thriving arts and culture scene in addition to its outdoor activities.

- Metro area population: 121,041.<sup>19</sup>
- Geography: Situated near the Mission Mountain Range.
- Closest metro area with a population of 1 million or more: Spokane, WA (198 miles).<sup>20</sup>
- Major university/college: University of Montana, Missoula College.
- Revenue from tourism: \$390 million (2022).<sup>21</sup>

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<sup>19</sup> U.S. Census Bureau (2022). American Community Survey 1-year estimates. Retrieved from Census Reporter Profile page for Bend, OR Metro Area <<http://censusreporter.dokku.censusreporter.org/profiles/31000US33540-missoula-mt-metro-area/>

<sup>20</sup> The Spokane MSA population is just under 1 million, but it is the closest large metro area to Missoula.

<sup>21</sup> Erickson, D. (2023, September 25). *Montana's complicated relationship with tourists: Input sought*. Missoulian. [https://missoulian.com/news/local/montana-tourism-missoula-plan-10-year/article\\_544ff2fa-589e-11ee-a4d3-07a236cf3f22.html](https://missoulian.com/news/local/montana-tourism-missoula-plan-10-year/article_544ff2fa-589e-11ee-a4d3-07a236cf3f22.html)

**Key industries.** Government, accommodations and food (hospitality), healthcare and construction are major industries in Missoula.<sup>22</sup>

**Cost of living and income.** The overall cost of living in Missoula is about 2 percent higher than the national average.<sup>23</sup> The median household income Missoula is just under \$60,000.<sup>24</sup> In 2020, the City of Missoula adopted an economic health strategic goal to support the development of affordable housing.<sup>25</sup>

D-4. Downtown Missoula, MT



Source: Joshualove via Wikimedia Commons.

<sup>22</sup> Barkey, P.M. (n.d.). *The economic outlook for Missoula and Ravalli Counties*. University of Montana Bureau of Business and Economic Research. <https://www.bber.umt.edu/pubs/seminars/2023/Missoula.pdf>

<sup>23</sup> Economic Research Institute (2024). *Cost of living data in Missoula, Montana, United States*. <https://www.eriesi.com/cost-of-living/united-states/montana/missoula>

<sup>24</sup> U.S. Census Bureau. (2022). Population Estimates, July 1, 2022 (V2022) — Bend city, OR [data table]. QuickFacts. <https://www.census.gov/quickfacts/fact/table/missoulacitymontana,US/PST045222>

<sup>25</sup> City of Missoula. (2020). *City of Missoula Strategic Plan 2020-2023*. <https://www.ci.missoula.mt.us/DocumentCenter/View/53797/City-of-Missoula-2020-2023-Strategic-Plan?bidId=>

## D. Cast Studies — Missoula, MT

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### City Workforce Programs and Services

The City of Missoula’s workforce programs and services are provided primarily through partner organizations.

### Workforce Partnerships

Organizations that provide workforce development services for job seekers in Missoula include the state workforce development board, Missoula Economic Partnership, the local university, the local community college and the local K-12 school district.

**MontanaWorks.** The statewide workforce development board, MontanaWorks, has a Job Service center in Missoula. MontanaWorks coordinates with the Montana Department of Labor and Industry to promote additional state workforce development resources and to advertise state job openings.

The State operates a paid apprenticeship program (described later) that MontanaWorks promotes. Additionally, the MontanaWorks website allows job seekers to search for WIOA-eligible training programs by provider and degree (or certificate) type. AccelerateMT is among these training providers that offers rapid training in a variety of industries, including healthcare, technology and construction and trades.

**University of Montana Missoula College.** The junior college of the University of Montana, Missoula College provides over 100 certificate programs, most of which require six or fewer classes to complete. Many of these are not specifically workforce development programs (e.g., certificate in African American Studies, which requires 15 credit hours), but can help students stand out in the job market.

**Missoula County Public Schools.** The City of Missoula aims to strengthen its partnership with Missoula County Public Schools.<sup>26</sup> MCPS partners with Missoula College to offer dual enrollment at many schools in the district. Additionally, many MCPS schools offer apprenticeships with local employers.

**Montana Registered Apprenticeship.** While not explicitly listed on the City’s website, the State of Montana offers a Registered Apprenticeship program that connects job seekers with employers looking to sponsor their training. All apprenticeships through this program are paid. The majority of the program apprentices work in the trades but the program is expanding its available industries and occupations.<sup>27</sup> MontanaWorks provides information on this program on its website.

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<sup>26</sup> City of Missoula. (2020). *City of Missoula Strategic Plan 2020-2023*. <https://www.ci.missoula.mt.us/DocumentCenter/View/53797/City-of-Missoula-2020-2023-Strategic-Plan?bidId=>

<sup>27</sup> Montana Registered Apprenticeship. (n.d.). *Partners*. <https://apprenticeship.mt.gov/partners>

## D. Case Studies — Lessons learned

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In this final section, we summarize major takeaways from studying the three communities in this appendix.

### Summary

Although Asheville, Bend and Missoula are different communities with distinct challenges (as is Flagstaff), there were several common themes. We note the following commonalities between each of the case study communities:

- Cities themselves do not directly offer full workforce development programs and instead partner with other agencies and organizations to deliver programs and services. (There are some programs that are directly offered by cities, but they are limited and relatively rare.)
- Local workforce development boards often lead local workforce development and have extensive partnerships with other organizations that act as service providers.
- Local community colleges are instrumental in providing workforce development, such as licensing and certification, soft skills training and industry-specific job training.
- Training programs are often general (internships, soft skills, low-hours certificates, CDL) but workforce development in some communities also invest in workforce for specific industries (OJT) and longer-term training, such as apprenticeship programs.
- Cost of living and housing are concerns in all communities. Although such issues go beyond the scope of this report, they greatly impact the workforce and create more urgency to train more local residents for living wage jobs.

# City of Flagstaff

## Workforce Development Strategic Plan — Final Results



**Presented by:**

Dave Keen, Principal

Dr. Nicole Yates, Senior Consultant

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July 2, 2024

**KEEN  
INDEPENDENT  
RESEARCH**

# Presentation overview



1. Brief recap of study background
2. Workforce development strategy
3. Themes in feedback received
4. Updates to the strategic plan

# Study background

## Research tasks

- Workforce data analysis
- Interviews/focus groups
  - City/County staff
  - Education leaders (K-12 and higher ed)
  - Workforce development professionals
  - Business representatives
- Case studies (Asheville, Bend, Missoula)
- Inventory of existing programs/services
- Literature review

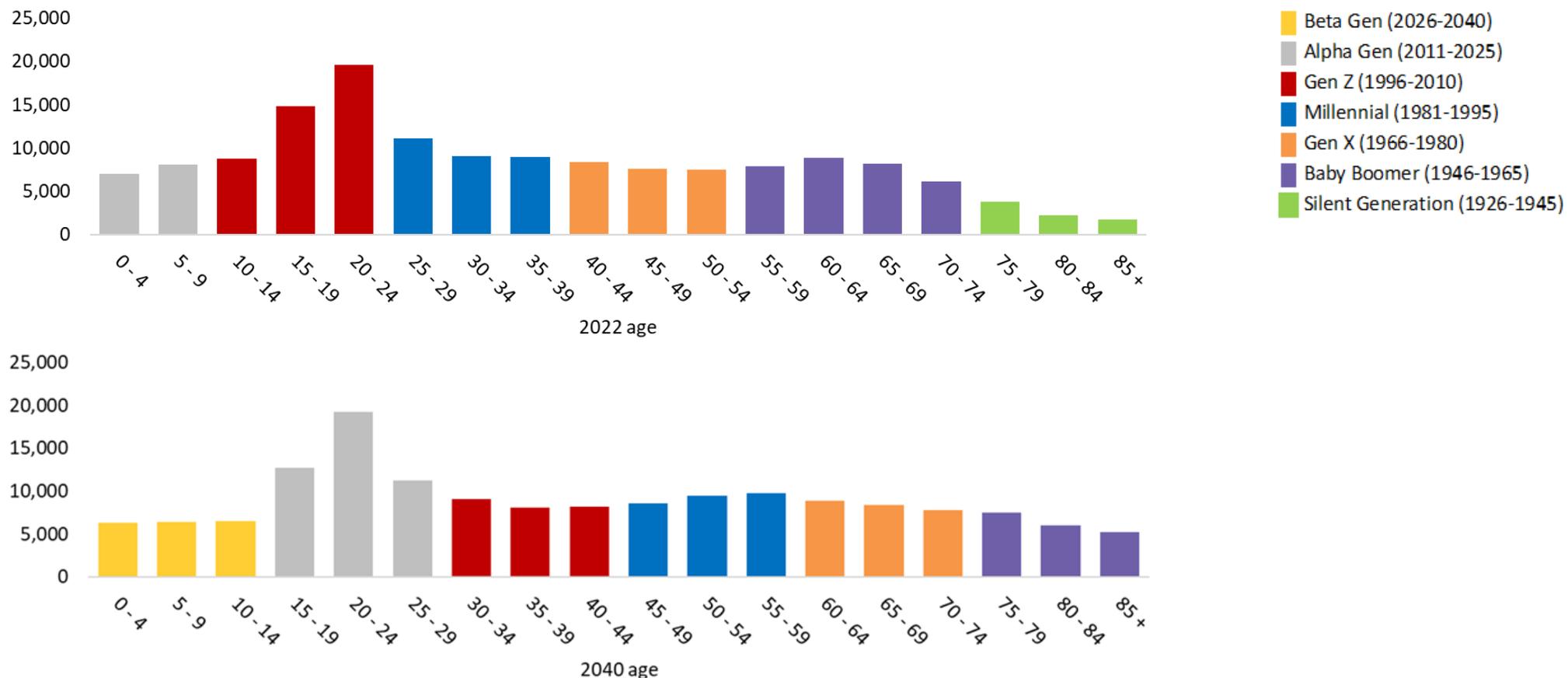
Coconino County 2022 and 2032 employment by industry

Coconino County	2022 Employment	2032 Employment	Percentage change	Numeric change
<b>Industry</b>				
Leisure and Hospitality	17,131	19,120	11.6 %	1,989
Education and Health Services	16,661	18,128	8.8	1,467
Trade Transportation and Utilities	10,200	10,907	6.9	707
Professional and Business Services	4,638	6,155	32.7	1,517
Self Employed	4,568	4,282	-6.3	-286
Government	4,215	4,163	-1.2	-52
Manufacturing	3,482	3,525	1.2	43
Construction	2,983	3,622	21.4	639
Other Services	2,395	2,429	1.4	34
Financial Activities	1,700	1,938	14.0	238
Information	543	646	19.0	103
Natural Resources and Mining	233	286	22.7	53
<b>Total</b>	<b>68,749</b>	<b>75,201</b>	<b>100.0 %</b>	<b>6,452</b>

Source: Arizona Commerce Authority, Employment Industry Projections.

# Study background — Population by age

Population by age group and generational cohort, Coconino County, 2022 and 2040



Source: Arizona Commerce Authority Coconino County Medium Series Population Projections.



# Study background — Findings

## Key takeaways

- Flagstaff has an acute affordability challenge that greatly impacts the workforce
- County workforce development board stewards WIOA funding and leads local workforce development efforts in partnership with NAU, CCC and others
- Income ceiling (about \$14,000 per year) limits who is eligible to participate in a program or training subsidized by WIOA
- City governments serve as partners in workforce development and do not directly offer programs/services
- Stakeholders see the City of Flagstaff playing being a regional leader, educator and convener to support ongoing workforce development efforts

*...I can't get anybody to move here because our rent prices are so high because our housing is so low.*

*Small business owner*

*Not everybody has to go to a four-year college. You can get certificates in different areas that are highly needed.*

*City elected official*

*Maybe the City needs to ... adopt a leadership role within Northern Arizona.*

*Healthcare employer representative*

*I would like to see us [continue to] be smart about investments in economic development. Growth has been what we've been talking about, but it really means the type of growth that we want.*

*City elected official*

# Workforce development strategy — Employment pathways

## Four-year degree pathways

- NAU and CCC graduate thousands of individuals in a variety of fields each year
- Key priority sectors\* with jobs requiring 4-year degrees
  - Astronomy
  - Biomedical/healthcare
  - Forestry
- Management-level positions across sectors often have bachelor's degree requirements

Median annual earnings of occupations related to astronomy, biomedical/healthcare and forestry in Coconino County, 2022

Occupation	Median annual earnings	Typical education level
<b>Astronomy occupations</b>		
Physical scientist	\$ 102,044	Bachelor's degree
Computer and mathematical occupations	76,190	Bachelor's degree
<b>Biomedical/healthcare occupations</b>		
Biomedical engineer	\$ 165,541	Bachelor's degree
Pharmacist	153,480	Doctoral or professional degree
Physician assistant	129,987	Master's degree
Nurse practitioner	121,009	Bachelor's degree
Medical and health services manager	102,911	Bachelor's degree
<b>Forestry occupations</b>		
Conservation scientists	\$ 75,026	Bachelor's degree
Environmental scientists	63,757	Bachelor's degree

\*As defined in the City's draft economic strategic plan

Source: Arizona Commerce Authority, 2022 Occupational Employment and Wages.

# Workforce development strategy — Employment pathways

## High school diploma (or equivalent) pathways

- Two-year degree and certificate programs available in Flagstaff (many through CCC)
- Key priority sectors\* with jobs requiring HS degrees
  - Food processing
  - Manufacturing
- Other sectors with HS degree-required jobs
  - Construction
  - Transportation
- Individuals in these jobs can also advance to supervisory positions with experience

Median annual earnings of occupations related to construction and manufacturing in Coconino County, 2022

Occupation	Median annual earnings	Typical education level
<b>Construction occupations</b>		
Supervisors of construction workers	\$ 66,467	HS diploma or equivalent
Construction equipment operators	50,618	HS diploma or equivalent
Construction and building inspectors	56,651	HS diploma or equivalent
Highway maintenance workers	46,226	HS diploma or equivalent
<b>Manufacturing occupations</b>		
Supervisors of production workers	\$ 65,932	HS diploma or equivalent
Machinists	63,070	HS diploma or equivalent
Industrial machinery mechanics	63,417	HS diploma or equivalent
Welders, cutters, solderers and brazers	46,881	HS diploma or equivalent

\*As defined in the City's draft economic strategic plan

# Workforce development strategy — Pathways (continued)

## High school diploma (or equivalent) pathways

- Two-year degree and certificate programs available in Flagstaff (many through CCC)
- Key priority sectors\* with jobs requiring HS degrees
  - Food processing
  - Manufacturing
- Other sectors with HS degree-required jobs
  - Construction
  - Transportation
- Individuals in these jobs can also advance to supervisory positions with experience

Median annual earnings of occupations related to transportation in Coconino County, 2022

Occupation	Median annual earnings	Typical education level
<b>Transportation occupations</b>		
Transportation, storage and distribution managers	\$ 84,520	HS diploma or equivalent
Supervisors of transportation workers	47,282	HS diploma or equivalent
Heavy and tractor-trailer truck drivers	48,753	HS diploma or equivalent
Light truck drivers	45,909	HS diploma or equivalent

Source: Arizona Commerce Authority, 2022 Occupational Employment and Wages.

\*As defined in the City's draft economic strategic plan

# Overall goals, suggested actions and timeframe for City of Flagstaff workforce development strategy

Goal	Target population	Sample actions	Timeframe (years)		
			1-2	3-5	6-10
1. Promote existing programs and pathways to four-year+ degree required jobs	Workers with bachelor's degrees or higher	Formalize partnerships with NAU, CCC and FUSD		X	
		Develop a workforce development landing page that describes career pathways		X	
2. Encourage new certificate and training programs	Skilled trade workers	Formalize partnership with Coconino County Workforce Development Board	X		
		Collect data from employers on what types of skills incoming employees need		X	
		Endorse new training programs (e.g., through NAU or CCC) that will lead to a recognizable credential			X
3. Promote upskilling programs	Workers looking to advance/change careers	Formalize partnership with Coconino County Workforce Development Board	X		
		Develop communications strategy around skill-building programs through CCC, CCWDB and others		X	
		Build relationships with nonprofits and community organizations to support ongoing workforce efforts			X
4. Facilitate conversations with businesses to determine needs	All workers	Form business advisory groups to regularly solicit feedback from various sectors		X	
		Encourage local business leaders and workers to serve on County Workforce Development Board			X
		Explore using City BBB funds to support businesses in developing paid internships that are not eligible for WIOA funding due to income eligibility restrictions	X		

# Themes in feedback received

## Key strengths

- Framing the issues in Flagstaff
- Positioning the City as a partner in workforce development efforts
- Integrating with the economic strategic plan
- Focusing on career pathways

## Room for improvement

- More acknowledgement of ongoing workforce activities by other local entities
  - FUSD
  - Greater Flagstaff Chamber of Commerce
  - Other local nonprofits
- Consideration of childcare



# Updates to strategic plan

## Strategic plan report

- Broadening of workforce development partnerships for the City to consider
- Acknowledgement of childcare as an important area for consideration

## Appendices

- Addition of workforce development activities of other local organizations to inventory
- Explanation of eligibility requirements for participation in WIOA-subsidized programs



Source: Ken Lund via Wikimedia Commons.

Thank you!

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Stacy Saltzburg, City Clerk  
**Co-Submitter:** Kevin Fincel  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



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**TITLE:**

**Consideration and Adoption of Resolution No. 2024-33:** A resolution approving the extension of an Intergovernmental Agreement between the City of Flagstaff and Coconino County regarding the County's continued use of the Joe C. Montoya Community and Senior Center to operate its Senior Nutrition Programs.

**STAFF RECOMMENDED ACTION:**

1. Read Resolution No. 2024-33 by title only
2. City Clerk reads Resolution No. 2024-33 by title only (if approved above)
3. Adopt Resolution No. 2024-33

**Executive Summary:**

This is the renewal of an Intergovernmental Agreement between the City of Flagstaff and Coconino County for the purposes of continuing the Meals on Wheels Program and the Congregate Meal Program for the benefit of seniors in the greater Flagstaff community.

**Financial Impact:**

There is no financial impact to the City with approval of this agreement.

**Policy Impact:**

This is an existing program with no policy impact.

**Connection to PBB, Carbon Neutrality Plan, 10-Year Housing Plan & Regional Plan:**

This Intergovernmental Agreement and its implementation relates closely to both the Regional Plan and the City of Flagstaff's Strategic Plan in the following ways:

Regional Plan, Policy Rec.1.2. Promote public and private partnerships to offer parks, recreation facilities, and resources.

Strategic Priority #1 Serve the public through quality internal and external customer service.

Strategic Priority #4 Work in partnership to enhance a safe and liveable community

**PBB:**

**Safe & Healthy Community:** Support social services, community partners, and housing opportunities.

**Carbon Neutrality Plan:**

**Inclusive Recreation-2:** Ensure equity, accessibility, and inclusion across all City of Flagstaff Parks and Recreation facilities, helping all members of the Flagstaff community to meet their health and wellness needs.

**Has There Been Previous Council Decision on This:**

This intergovernmental agreement was last approved in June 2019.

**Options and Alternatives:**

1. Approve the extension as proposed.
2. Direct staff to make changes to the intergovernmental agreement.
3. Not approve the extension.

**Background and History:**

For more than 20 years, Coconino County has provided a congregate meal to seniors and the disabled each weekday at noon at the Joe C. Montoya Community and Senior Center. Additionally, the Meals on Wheels program prepares and delivers a weekday noon meal to homebound seniors within city limits. This program has been run cooperatively with the City and the County partnering to deliver a nutritious meal and for congregate meal participants, socialization and communal activities. The Joe C. Montoya Community and Senior Center was designed specifically with this program in mind. Design features and amenities were selected specifically for this partnership and implementing this agreement maximizes the use of this City facility.

**Key Considerations:**

The Meals on Wheels and Congregate Meal program have been providing a nutritious meal to senior citizens in partnership with the City of Flagstaff for more than 20 years. Ensuring that seniors receive a nutritious meal is a vital part of maintaining a healthy elder population. For many program participants, this is the only interaction they may have with other community members each day. For the Meals on Wheels participants, receiving the daily meal also serves as a "Well Check" for them. Trained County staff interface personally with these seniors each day allowing case workers and others the ability to keep in touch with people and monitor their general well being. Besides the nutritional benefits, patrons are also benefiting from the ancillary offerings at the Joe C. Montoya Center during the lunch program, including informational discussions regarding their health and wellness, exercise, and continuing education sessions.

**Community Involvement:**

Community members participating in either the Meals on Wheels or Congregate Meal Program benefit greatly from their involvement. The daily social interaction and expectation that one attends helps hold people accountable to one another and enhances their social network thus keeping them involved in their community. Additionally, other benefits besides nutrition are provided to program participants to help them live longer, healthier and more rewarding lives as active members of their community.

---

**Attachments:**    Res. 2024-33  
                          Executed IGA

**RESOLUTION NO. 2024-33**

**A RESOLUTION OF THE FLAGSTAFF CITY COUNCIL, APPROVING THE EXTENSION OF AN INTERGOVERNMENTAL AGREEMENT BETWEEN THE CITY OF FLAGSTAFF AND COCONINO COUNTY REGARDING THE COUNTY'S CONTINUED USE OF THE JOE C. MONTOYA SENIOR CENTER TO OPERATE ITS SENIOR NUTRITION PROGRAMS**

**RECITALS:**

WHEREAS, the Joe C. Montoya Community and Senior Center ("Center") is a facility owned and operated by the City of Flagstaff ("City") located at 245 North Thorpe Park Road in Flagstaff;

WHEREAS, Coconino County ("County") operates its Senior Congregate and Meals on Wheels programs at the Center, using the kitchen for meal preparation Monday through Friday, the Allen Room for congregare meals, and the driveway for Meals on Wheels and deliveries;

WHEREAS, the County's current use of the Center for its senior nutrition programs is governed by an intergovernmental agreement with the City dated June 4, 2019, which has an initial term of five years with the option for two (2) successive five (5) year renewal terms;

WHEREAS, the County and the City desire to renew the Intergovernmental Agreement pursuant to the existing terms and conditions under which the County will continue to have access to the Center for the purpose of carrying out its senior nutrition programs;

WHEREAS, the County and the City are empowered by Arizona Revised Statutes § 11-952 to enter into the proposed Intergovernmental Agreement;

WHEREAS, the City Council has read and considered the staff summary report and current Intergovernmental Agreement attached hereto and finds that it is in the best interests of the City to renew the Agreement for an additional five (5) year term.

**ENACTMENTS:**

**NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF FLAGSTAFF AS FOLLOWS:**

**SECTION 1. In General.**

That the Intergovernmental Agreement between the County and the City dated June 4, 2019, pertaining to the County's Senior Congregate and Meals on Wheels Programs at the Center be renewed for an additional five (5) year term.

**SECTION 2. Effective Date.**

This resolution shall be immediately effective upon adoption.

PASSED AND ADOPTED by the City Council of the City of Flagstaff this 2nd day of July 2024.

---

MAYOR

ATTEST:

---

CITY CLERK

APPROVED AS TO FORM:

---

CITY ATTORNEY

Exhibits:  
IGA

**INTERGOVERNMENTAL AGREEMENT**

**by and between  
Coconino County  
and the  
City of Flagstaff**

This Intergovernmental Agreement ("Agreement") is made this 4<sup>th</sup> day of June 2019, by and between COCONINO COUNTY, a political subdivision of the State of Arizona, of 219 East Cherry Avenue, Flagstaff, Arizona ("County") and the CITY OF FLAGSTAFF, an Arizona municipal corporation with offices at 211 West Aspen Avenue, Flagstaff, Arizona ("City") for use of the Joe C. Montoya Community and Senior Center ("Center") for senior nutrition programs. The City and County may be referred to individually in this Agreement as a Party or collectively as Parties.

**RECITALS**

- A. The Joe C. Montoya Community and Senior Center is a City-owned and operated facility located at 245 North Thorpe Park Road in Flagstaff.
- B. The County operates its Senior Congregate and Meals on Wheels programs at the Center, using the kitchen for meal preparation Monday through Friday, the Allen Room for congregate meals, and the driveway for Meals on Wheels and deliveries.
- C. Funding for the County nutrition programs is provided by Older American Act funds through the Area-Agency on Aging, Coconino County general funds, and participant and corporate donations.
- D. The County's current use of the Center for its senior nutrition programs is governed by an intergovernmental agreement with the City dated March 6, 2014, which has a term of five years.
- E. The County and the City desire to enter an intergovernmental agreement establishing the terms and conditions under which the County will continue to have access to the Center for the purpose of carrying out its senior nutrition programs.

NOW THEREFORE, pursuant to A.R.S. § 11-952, authorizing contracts between public agencies for services or the joint exercise of powers common to both, and the inherent powers of each Party to protect the health and welfare of its constituents, for and in consideration of the mutual obligations and covenants set forth herein, the Parties agree as follows:

**AGREEMENT**

**1. DURATION AND TERMINATION.**

This Agreement shall be effective on the date first set forth above and shall continue in force and effect for an Initial Term of five (5) years. Upon expiration of the Initial Term, this Agreement may be renewed for up to two (2) successive five (5) year terms (each a "Renewal Term") subject to the provisions of this IGA upon mutual written consent of the Parties. This Agreement may be terminated by either Party upon thirty (30) days written notice of termination delivered to the other Party. Either Party may terminate this Agreement if sufficient funding is no longer available to carry out that Party's responsibilities under the Agreement. This Agreement may be terminated by either Party without penalty or further obligation, in accordance with the provisions of Arizona Revised Statutes §38-511, in the event of the occurrence of any of the circumstances described in A.R.S. §38-511(A).

**2. FUNDING; FINANCIAL RESPONSIBILITIES.**

The County shall be responsible and pay for all expenses associated with the operation of its senior nutrition programs, including but not limited to, the costs of food, supplies, telephones, vehicles, gasoline, liability insurance, and the maintenance and upkeep of all kitchen equipment, appliances, drains, and other items necessary for the operation of the program. The County shall be responsible for obtaining and paying for all permits and inspections necessary to operate the senior nutrition programs. The County shall pay for all costs associated with the supervision of its senior nutrition program staff. Any kitchen improvements or replacement of large equipment or appliances must be approved by the City in advance. The County shall pay for repairing or replacing any kitchen equipment damaged as a result of the County's own negligent use of such equipment. Aside from the references to maintenance obligations in Section 6 below, the City shall maintain only the Center itself and pay for the upkeep and repair of the same. The County shall maintain and pay for the upkeep, repairs and/or replacement of the storage shed located outside the Center near the kitchen entrance.

**3. UTILITIES.**

The City shall pay for all utility costs in the Center (other than communications related utilities including but not limited to phone, fax and internet services).

**4. SCHEDULING; USE OF BUILDING.**

The County shall have use of the kitchen for all meal program events between 5:30 a.m. and 2:30 p.m. Monday through Friday. The County shall have use of the Allen Room for meal program events between 10:30 a.m. and 2:30 p.m. Monday through Friday. No other groups or events shall be scheduled in the kitchen or Allen Room during the times listed above, without prior notification. The County may use the kitchen and Allen Room at other times subject to City approval and space availability. Programs and events have priority use of the Allen room outside of the times allocated to the County as defined in this agreement. If the need arises that the City requires the use of the Allen room and/or kitchen during the County's allotted time slot, the City may, in its sole discretion, use the kitchen and/or Allen Room. Where possible, the City shall give the County a two (2) week notice prior to such use. However, in the event that no such prior notice is possible due to an emergency situation, the City shall not be required to give the County the two (2) week notice.

**5. DAILY OPERATIONAL STANDARDS.**

The County shall maintain the kitchen and Allen Room in a sanitary and safe condition at all times, per County health regulations. The County agrees to set up the Allen Room beginning at 10:30 a.m. and to clear the Allen Room beginning at 1:30 p.m. each day, Monday through Friday. County employees and volunteers will conduct themselves at all times in a professional and courteous manner while utilizing the kitchen at the Center.

The County agrees to clean off all tables and chairs prior to putting them away and to sweep and mop the floors to remove all debris after each serving. City staff will monitor clean up to ensure areas are ready for the next user group. County staff shall limit their activities, as much as possible, to the kitchen and Allen Room and shall keep other areas free of equipment and materials that may block or otherwise impair the use of the Center for other purposes. County staff shall alert the City of any special events, safety concerns, or repairs that are needed at the Center that the County becomes aware of under the course of its activities under this Agreement

**6. FACILITIES AND EQUIPMENT USE AND MAINTENANCE; SUPPLIES.**

The County shall maintain all kitchen equipment in an operational and sanitary condition, in compliance with applicable County health requirements. The County shall not allow any entity other than the County and its employees to use the kitchen equipment during the County's scheduled use periods. The City shall take reasonable steps to ensure that dining or food supplies purchased by the County are not used by any

other entity without the express permission of the County. The County shall clearly identify and label its dining and food supplies. As the kitchen and equipment are utilized extensively by the County, replacement of and repairs to existing kitchen equipment shall be handled on a case by case basis to determine which Party will be responsible for maintenance or replacement. These determinations will ultimately be made by the City, after the matter is reviewed by the Center's Supervisor, Facilities Supervisor, and the Recreation Services Director in cooperation with staff designated by the County. The County will pay for the replacement of dining room tables as needed as they are used primarily for the meal program.

**7. EMPLOYMENT STATUS.**

County employees and volunteers associated with the senior nutrition programs shall at all times remain employees of the County. The City shall not have supervisory authority or control over the day-to-day work of the County employees or volunteers associated with the County's senior nutrition programs.

**8. INSURANCE.**

The County and the City shall each maintain sufficient liability insurance to cover each Party's respective activities associated with this Agreement.

**9. INDEMNIFICATION.**

Each party (as "Indemnitor") agrees to indemnify, defend and hold harmless the other party (as "Indemnitee") from and against any and all claims, losses, liability, costs or expenses, including reasonable attorney fees, (hereinafter collectively referred to as "Claims") arising out of bodily injury of any person, including death, or property damage, but only to the extent that such Claims which result in vicarious or derivative liability to the Indemnitee are caused by the act, omission, negligence, misconduct or other fault of the Indemnitor, its officers, officials, agents, employees or volunteers.

**10. NOTICES.**

Any notice or other communication required or permitted to be given under this Agreement shall be in writing and sent to the address given below for the Party to be notified, or to such other address, notice of which is given in accordance with this Section:

If to the County:

If to the City:

County Manager  
219 East Cherry Avenue  
Flagstaff, AZ 86001

City Manager  
211 West Aspen Avenue  
Flagstaff, AZ 86001

**11. AUTHORITY TO CONTRACT.**

Each Party represents and warrants that it has full power and authority to enter into this Agreement and perform its obligations hereunder and has taken all required acts or actions necessary to authorize the same.

**12. GOVERNING LAW.**

This Agreement shall be governed, interpreted, and enforced in accordance with the laws of the State of Arizona.

**13. DISPUTE RESOLUTION.**

Either Party shall have the right to litigate any disputes which arise under this Agreement. Any litigation brought by either Party against the other to enforce the provisions of this Agreement must be filed in the Coconino County Superior Court. In the event any action at law or in equity is instituted between the Parties in connection with this Agreement, the prevailing Party in the action will be entitled to its costs including reasonable attorneys' fees and court costs from the non-prevailing Party.

**14. AGENTS, EMPLOYEES, AND CONTRACTORS**

Agents, employees and contractors hired by a Party to provide services under this Agreement shall be and remain the agents, employees, and contractors of the hiring Party solely, and shall not be considered agents, employees, or contractors of the other Party.

**15. LEGAL WORKERS.**

As mandated by Arizona Revised Statutes § 41-4401, each Party (a) warrants the Party's compliance with all federal immigration laws and regulations that relate to the Party's employees and their compliance with Arizona Revised Statutes § 23-214(A); (b) acknowledges that a breach of the warranty in subsection (a) of this section shall be deemed a material breach of this Agreement that is subject to penalties up to and including termination of this Agreement; and (c) retains the legal right to inspect the papers of any contractor or subcontractor employee who works pursuant to this Agreement to ensure compliance with the warranty.

**16. CONSTRUCTION.**

This Agreement shall be construed as a whole and in accordance with its fair meaning. This Agreement shall not be construed for or against either Party.

**17. INTEGRATION; MODIFICATION.**

Both Parties acknowledge and agree that they have not relied upon any statements, representations, agreements, or warranties, except as expressed in this Agreement, and that this Agreement constitutes the Parties' entire agreement with respect to the matters addressed. All prior or contemporaneous agreements and understandings, oral or written, with respect to such matters are superseded by and merged in this Agreement. This Agreement may be modified or amended only by written agreement signed by or for both Parties, and any such modification or amendment will become effective on the date so specified.

**18. NO ASSIGNMENT; BINDING EFFECT.**

This Agreement is not assignable by either Party. Any attempt to do so shall render the assignment null and void and the Agreement may be terminated immediately by the non-assigning Party.

**19. SEVERABILITY.**

In the event that a court of competent jurisdiction shall hold any part or provision of this Agreement void or of no effect, the remaining provisions of this Agreement shall remain in full force and effect.

**20. WAIVER.**

No failure to enforce any condition or covenant of this Agreement shall imply or constitute a waiver of the right to insist upon performance of such condition or covenant, or of any other provision hereof, nor shall any waiver by either Party of any breach of any one or more conditions or covenants of this Agreement constitute a waiver of any succeeding or other breach of this Agreement.

**21. HEADINGS.**

The headings used in this Agreement are for convenience only and are not intended to alter or affect the meaning of any provision of this Agreement.

**[SIGNATURE PAGE FOLLOWS]**

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed as of the day and year first above written.

**CITY OF FLAGSTAFF**



Barbara Goodrich  
City Manager

Dated: 5/3/19

Attest:

  
Nancy M. Quinn  
City Clerk

Dated: 5/3/19

Approved as to form and as to authority granted  
by law:

  
City Attorney

Dated: 4/30/19

**COCONINO COUNTY**



Art Babbott, Chairman  
Board of Supervisors

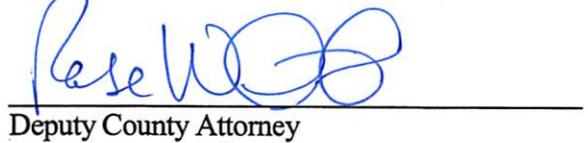
Dated: 6/4/19

Attest:

  
Clerk of the Board

Dated: 6/4/19

Approved as to form and as to authority granted  
by law:

  
Deputy County Attorney

Dated: 6/4/19

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Sterling Solomon, City Attorney  
**Date:** 06/27/2024  
**Meeting Date:** 07/02/2024



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**TITLE:**

**Consideration and Adoption Resolution No. 2024-34:** A resolution of the Flagstaff City Council authorizing approval of the Northeastern Arizona Indian Water Rights Settlement Agreement

**STAFF RECOMMENDED ACTION:**

1. Read Resolution No. 2024-34 by title only
2. City Clerk reads Resolution No. 2024-34 by title only (if approved above)
3. Adopt Resolution No. 2024-34

**Executive Summary:**

The litigation of cases known as "In Re: The General Adjudication of All Rights to Use Water in the Little Colorado River General Adjudication, CV 6417; In Re: Hopi Reservation HSR, Contested Case No. CV 6417-203; In Re: Navajo Nation, Contested Case No. CV 6417-300 has been ongoing in various forms since 1978. Hereinafter, the litigation shall be referred to as the "Adjudication." This momentous resolution is a result of a comprehensive water rights settlement that resolves the water rights claims of the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and the United States acting as trustee for each Tribe, in the Adjudication. Staff is providing the City Council with a resolution authorizing approval of the Northeastern Arizona Indian Water Rights Settlement Agreement for City Council's consideration and possible approval.

The Northeastern Arizona Indian Water Rights Settlement Agreement ("Agreement") dated as of May 9, 2024, resolves certain water rights disputes in the Adjudication, and specifically the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and the United States acting as trustee for each Tribe. The Hopi Tribe approved the Agreement on May 20, 2024, the Navajo Nation approved the Agreement on May 23, 2024, and the San Juan Southern Paiute approved the Agreement on May 23, 2024. The City has determined it is in the best interests of the City to enter into the Agreement and end protracted and costly litigation related to these water rights claims.

The Agreement anticipates federal funding for needed water supply infrastructure projects benefiting the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe. The Agreement will confirm, among the Parties to the Agreement, certain surface water rights and groundwater rights for the City. Certain exhibits to the Agreement must be completed or updated before execution of the Agreement by the Parties, including the City's Exhibits set forth in Attachment A to the resolution.

In 2005, and with 71% voter approval, the City acquired Red Gap Ranch, located approximately 35 miles east of Flagstaff, for the purpose of developing its future municipal water supply and to provide water resiliency and water security for its residents. The City has invested millions of dollars in acquiring Red Gap Ranch for a municipal water supply project and continues to invest in the development of a Regional Water Supply Project by conducting engineering feasibility studies, design plans, hydrology studies and by having drilled no less than ten (10) additional wells at Red Gap Ranch for municipal use.

In 2011, and in anticipation of a comprehensive water rights settlement that did not materialize at that time, the City entered into a stipulation with the Navajo Nation regarding Red Gap Ranch; however, that 2011

stipulation was never submitted to the Adjudication court for binding effect and enforcement as between the parties to the 2011 stipulation and by its own terms remains null and void. There is no new stipulation or other agreement between the City and the Navajo Nation regarding Red Gap Ranch included as an exhibit to the Agreement.

Groundwater uses and wells are addressed in Paragraph 9.0 of the Agreement which establishes two groundwater "Buffer Zones." The vast majority of Red Gap Ranch is located in these two Buffer Zones, and only one parcel of Red Gap Ranch fee land is located outside of these Buffer Zones. Paragraph 9.0 of the Agreement provides for the right to use groundwater from Existing Wells in the two Buffer Zones. In Paragraph 9.0 of the Agreement, Existing Wells located in Buffer Zone 1 and Buffer Zone 2 as of the Effective Date will be catalogued by the Arizona Department of Water Resources based on the capacity of the well or well casing sizes provided in Table 1 of subparagraph 9.4.1. In Buffer Zone 1 on Red Gap Ranch, the City owns eleven (11) Existing Wells with a total pumping capacity of 2,912 acre-feet per year, as further described on Attachment B. In Buffer Zone 2 on Red Gap Ranch, the City owns sixteen (16) Existing Wells with a total pumping capacity of up to 19,003 acre-feet per year, as further described on Attachment B. Paragraph 9.0 of the Agreement allows for the replacement of Existing Wells. Paragraph 9.0 of the Agreement allows for the drilling of New Wells, subject to certain requirements. There are no restrictions on withdrawals of groundwater from Wells located outside the Buffer Zones.

The Regional Water Supply Project is a critical component of the City's future water supply and necessary for the City's water resiliency and water security needs. The Regional Water Supply Project is also an important component of the Agreement because Paragraph 12.0 allows the Navajo Nation to have access to the Regional Water Supply Project by entering into Water Supply Contracts with the City as described the Agreement.

In Paragraph 9.0 of the Agreement, the Arizona State Land Department agrees to coordinate with the City regarding the drilling of New Wells on Arizona State Land Department parcels in and around Red Gap Ranch for the benefit of the Regional Water Supply Project. The City continues to identify, in coordination with the Arizona Department of Transportation, and with further anticipated input from regional participants including the Navajo Nation, the Hopi Tribe and the Arizona State Land Department, various Points of Access to the Regional Water Supply Project at ADOT intersections along the Interstate 40 corridor, or at other mutually beneficial locations. To further the development of the Regional Water Supply Project, the City is seeking federal funding on a cost-share basis.

City Council's adoption of this resolution will authorize 1) the City's approval of the Northeastern Arizona Indian Water Rights Settlement Agreement subject to the inclusion of the correct City exhibits attached to the resolution, and authorize and direct 2) the City Attorney to make such conforming or other changes as might be required and consistent with the Agreement before formal execution of the Agreement by the City, 3) the City Manager and City Attorney to take such other actions as are necessary to carry out the purpose of the resolution, and 4) the City Manager and City Attorney to seek federal funding on a cost-share basis for the further development of the Regional Water Supply Project described in the Agreement, and by other legislation, grants or viable funding sources.

The settlement agreement and related documents are also attached to the staff summary.

**Financial Impact:**

None at this time.

**Policy Impact:**

Confirm the City's water rights among the Parties to the Agreement and improve relations with our Indigenous partners as their claims for water rights will be resolved.

**Previous Council Decision or Community Discussion:**

Many City Councils and the community over the decades have discussed, voted and overwhelmingly indicated the importance of securing the City's water resources in the context of the Adjudication, ensuring the City's future municipal supplies at Red Gap Ranch, and the role that the Red Gap Regional Water Supply Project plays in assuring those water resources for the City and the region.

**Options and Alternatives to Recommended Action:**

1. Approve the resolution authorizing the settlement agreement that resolves the water rights claims of the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute, and the United States acting as trustee for each Tribe, and confirms among the Parties to the Agreement, the City's water rights in the Adjudication.
2. Continue litigation with the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute, and the United States acting as trustee for each Tribe, and other Parties regarding their claims and the City's claims in the Adjudication.

**Connection to PBB Priorities and Objectives:**

**Connection to Regional Plan:**

**Connection to Carbon Neutrality Plan:**

**Connection to 10-Year Housing Plan:**

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**Attachments:**    Res. 2024-34  
                          Attachments A & B  
                          NAIWR Settlement Agreement  
                          Exhibit 3.1.4 from SA (proposed legislation)  
                          Exhibit 3.1.12 (Map of Buffer Zone 1 and 2)  
                          Exhibit 8.8.2 (Map of LCR Hydrologic Unit Code)

## RESOLUTION NO. 2024-34

### A RESOLUTION OF THE FLAGSTAFF CITY COUNCIL AUTHORIZING APPROVAL OF THE NORTHEASTERN ARIZONA INDIAN WATER RIGHTS SETTLEMENT AGREEMENT

#### RECITALS:

WHEREAS, the City of Flagstaff (City) and multiple other parties are actively engaged in the case known as, In Re: The General Adjudication of All Rights to Use Water in the Little Colorado River General Adjudication, CV 6417 (“Adjudication”); and In re: Hopi Reservation HSR, Contested Case No. CV 6417-203; and In re: Navajo Nation, Contested Case No. CV 6417-300;

WHEREAS, the Northeastern Arizona Indian Water Rights Settlement Agreement (“Agreement”) dated as of May 9, 2024, resolves certain water rights disputes in the Adjudication, and specifically the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and the United States acting as trustee for each Tribe;

WHEREAS, the Hopi Tribe approved the Agreement on May 20, 2024, the Navajo Nation approved the Agreement on May 23, 2024, and the San Juan Southern Paiute approved the Agreement on May 23, 2024;

WHEREAS, the City has determined it is in the best interests of the City to enter into the Agreement and end protracted and costly litigation related to the water rights claims of the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and the United States acting as trustee for each Tribe;

WHEREAS, the Agreement anticipates federal funding for needed water supply infrastructure projects benefiting the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe;

WHEREAS, the Agreement will confirm, among the Parties to the Agreement, certain surface water rights and groundwater rights for the City;

WHEREAS, certain exhibits to the Agreement must be completed or updated before execution of the Agreement by the Parties, including the City’s Exhibits set forth in Attachment A;

WHEREAS, in 2005 and with 71% voter approval, the City acquired Red Gap Ranch, located approximately 35 miles east of Flagstaff, for the purpose of developing its future municipal water supply and to provide water resiliency and water security for its residents;

WHEREAS, the City has invested millions of dollars in acquiring Red Gap Ranch for a municipal water supply project and continues to invest in the development of a Regional Water Supply Project by conducting engineering feasibility studies, design plans, hydrology studies and by having drilled no less than ten (10) additional Wells at Red Gap Ranch for municipal use;

WHEREAS, in 2011, and in anticipation of a comprehensive water rights settlement that did not materialize at that time, the City entered into a stipulation with the Navajo Nation regarding Red Gap Ranch; however, that 2011 stipulation was never submitted to the Adjudication court for binding effect and enforcement as between the parties to the 2011 stipulation and by its own terms remains null and void;

WHEREAS, there is no new stipulation or other agreement between the City and the Navajo Nation regarding Red Gap Ranch included as an exhibit to the Agreement;

WHEREAS, Paragraph 9.0 of the Agreement establishes two groundwater “Buffer Zones”;

WHEREAS, the vast majority of Red Gap Ranch is located in these two Buffer Zones, and only one parcel of Red Gap Ranch fee land is located outside of these Buffer Zones;

WHEREAS, Paragraph 9.0 of the Agreement provides for the right to use groundwater from Existing Wells in the two Buffer Zones;

WHEREAS, in Paragraph 9.0 of the Agreement, Existing Wells located in Buffer Zone 1 and Buffer Zone 2 as of the Effective Date will be catalogued by the Arizona Department of Water Resources based on the capacity of the Well or Well casing sizes provided in Table 1 of subparagraph 9.4.1;

WHEREAS, in Buffer Zone 1 on Red Gap Ranch, the City owns eleven (11) Existing Wells with a total pumping capacity of 2,912 acre-feet per year, as further described on Attachment B;

WHEREAS, in Buffer Zone 2 on Red Gap Ranch, the City owns sixteen (16) Existing Wells with a total pumping capacity of up to 19,003 acre-feet per year, as further described on Attachment B;

WHEREAS, Paragraph 9.0 of the Agreement allows for the replacement of Existing Wells;

WHEREAS, Paragraph 9.0 of the Agreement allows for the drilling of New Wells, subject to certain requirements;

WHEREAS, there are no restrictions on withdrawals of groundwater from Wells located outside the Buffer Zones;

WHEREAS, the Regional Water Supply Project is a critical component of the City’s future water supply and necessary for the City’s water resiliency and water security needs;

WHEREAS, the Regional Water Supply Project is also an important component of the Agreement because Paragraph 12.0 allows the Navajo Nation to have access to the Regional Water Supply Project by entering into Water Supply Contracts with the City as described the Agreement;

WHEREAS, in Paragraph 9.0 of the Agreement, the Arizona State Land Department agrees to coordinate with the City regarding the drilling of New Wells on Arizona State Land Department parcels in and around Red Gap Ranch for the benefit of the Regional Water Supply Project;

WHEREAS, the City continues to identify, in coordination with the Arizona Department of Transportation, and with further anticipated input from regional participants including the Navajo Nation, the Hopi Tribe and the Arizona State Land Department, various Points of Access to the Regional Water Supply Project at ADOT intersections along the Interstate 40 corridor, or at other mutually beneficial locations;

WHEREAS, to further the development of the Regional Water Supply Project, the City is seeking federal funding on a cost-share basis.

**ENACTMENTS:**

**NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF FLAGSTAFF AS FOLLOWS:**

SECTION 1. General.

The City Council hereby approves the Northeastern Arizona Indian Water Rights Settlement Agreement in substantial form, subject to the express inclusion of the correct City Exhibits attached to this Resolution.

SECTION 2. Delegation of Authority.

FURTHER authorizing and directing the City Attorney to make such conforming or other changes as might be required and consistent with the Agreement before formal execution of the Agreement by the City.

FURTHER authorizing and directing the City Manager and City Attorney to take such other actions as are necessary to carry out the purpose of this Resolution.

FURTHER authorizing and directing the City Manager and City Attorney to seek federal funding on a cost-share basis for the further development of the Regional Water Supply Project described in the Agreement, and by other legislation, grants or viable funding sources.

SECTION 3. Effective Date.

This Resolution shall be immediately effective.

PASSED AND ADOPTED by the City Council of the City of Flagstaff this 2nd day of July, 2024.

\_\_\_\_\_  
MAYOR

ATTEST:

\_\_\_\_\_  
CITY CLERK

APPROVED AS TO FORM:

\_\_\_\_\_  
CITY ATTORNEY

Exhibits:  
Attachment A  
Attachment B

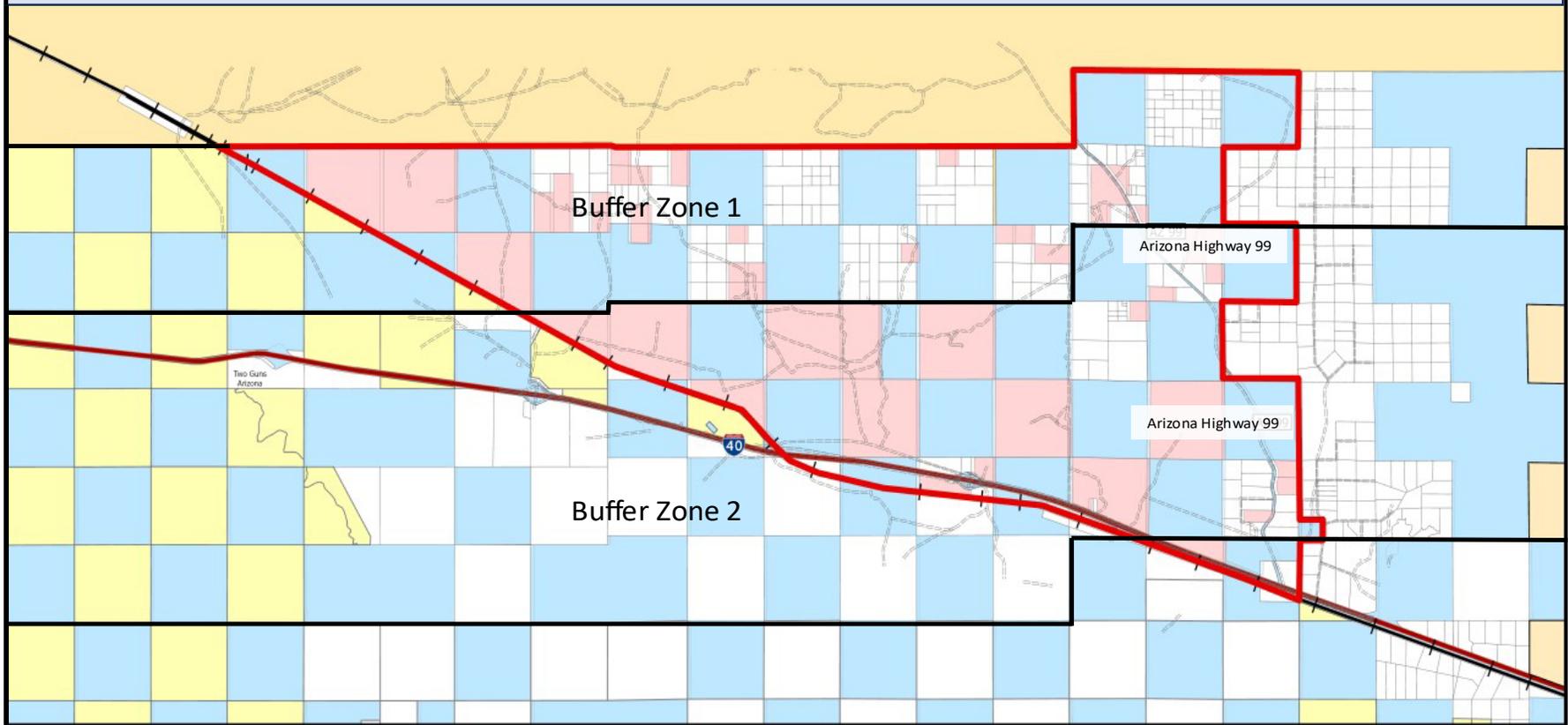
**ATTACHMENT A**

**Exhibit 3.1.134A**

# Northeastern Arizona Indian Water Rights Settlement

## EXHIBIT 3.1.134A

### Map of Red Gap Ranch



- Red Gap Ranch Boundary
- Navajo Lands
- Private Property
- Hopi Lands
- Red Gap Ranch Property
- ASLD Lands as of the Effective Date



Arizona Water Buffalo LLC  
Hydrology & Water Resource Mgt.

For Agreement Dated as of May 9, 2024



Basemap Image from Water Services

**Exhibit 3.1.134B**

**LEGAL DESCRIPTION OF RED GAP RANCH LANDS**

PARCEL NO. 1

THAT PORTION OF SECTION 1, LYING NORTH OF THE NORTH RIGHT OF WAY LINE OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD, LOCATED IN TOWNSHIP 20 NORTH, RANGE 12 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;  
EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 2:

THAT PORTION OF SECTION 11, AND SECTION 13 LYING NORTH OF THE NORTH RIGHT OF WAY LINE OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD, LOCATED IN TOWNSHIP 20 NORTH, RANGE 12 ½ EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 3:

ALL OF SECTION 3, TOWNSHIP 20 NORTH, RANGE 12 ½ EAST, GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 4:

ALL OF SECTION 23, AND SECTION 25, TOWNSHIP 20 NORTH, RANGE 13 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 14/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 5:

ALL OF SECTIONS 21 AND 27; THE WEST HALF OF SECTION 22; THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 18, AND THOSE PORTIONS OF SECTIONS 19, 29 AND 33, LYING NORTH OF THE NORTH RIGHT OF WAY LINE OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD, LOCATED IN TOWNSHIP 20 NORTH, RANGE 13 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPTING THEREFROM ANY PORTION LYING WITHIN INTERSTATE HIGHWAY 40 AS SET FORTH IN FINAL ORDER OF CONDEMNATION RECORDED MAY 29, 1974 IN DOCKET 507, PAGE 476, AND IN DOCKET 507, PAGE 520, RECORDS OF COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 6:

ALL OF SECTION 29 AND THAT PORTION OF SECTION 31, LYING NORTH OF THE NORTH RIGHT OF WAY OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD, LOCATED IN TOWNSHIP 20 NORTH, RANGE 14 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPTING THE WEST HALF OF THE WEST HALF OF THE NORTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 31;

FURTHER EXCEPTING THEREFROM ANY PORTION OF SECTION 31 LYING WITHIN INTERSTATE HIGHWAY 40 AS SET FORTH IN FINAL ORDER OF CONDEMNATION RECORDED MAY 29, 1974 IN DOCKET 507, PAGE 476, AND IN DOCKET 507, PAGE 520, RECORDS OF COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 7:

THAT PORTION OF SECTION 5 LYING NORTH OF THE NORTH RIGHT OF WAY OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD, LOCATED IN TOWNSHIP 19 NORTH, RANGE 14 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPTING THEREFROM ANY PORTION LYING WITHIN INTERSTATE HIGHWAY 40 AS SET FORTH IN FINAL ORDER OF CONDEMNATION RECORDED MAY 29, 1974 IN DOCKET 507, PAGE 476, AND IN DOCKET 507, PAGE 520, RECORDS OF COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 8:

THAT PORTION OF SECTION 35 LYING NORTH OF THE NORTH RIGHT OF WAY LINE OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD, LOCATED IN TOWNSHIP 20 NORTH, RANGE 13 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT A RECTANGULAR PARCEL OF LAND 210 FEET BY 622.29 FEET LOCATED IN THE NORTHWEST QUARTER OF SAID SECTION 35, BOUNDED BY LINES MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF SAID SECTION 35, SAID CORNER BEING A GOVERNMENT LAND OFFICE STANDARD BRASS CAP MARKER, THE COMMON CORNER OF SECTION 26, 27, 34 AND 35 IN SAID TOWNSHIP AND RANGE;

THENCE SOUTH 0° 03' 30" EAST ALONG THE WEST BOUNDARY OF SAID SECTION 35, A DISTANCE OF 1162.05 FEET TO AN INTERSECTION WITH THE SOUTHERLY BOUNDARY OF THE RIGHT OF WAY OF THE NEWLY CONSTRUCTED HIGHWAY 66;

THENCE SOUTH 79° 52' EAST ALONG THE SOUTHERLY BOUNDARY OF THE HIGHWAY RIGHT OF WAY A DISTANCE OF 2017.35 FEET TO THE TRUE POINT OF BEGINNING;

THENCE CONTINUING ALONG THE SAID SOUTHERLY BOUNDARY OF THE HIGHWAY RIGHT OF WAY,

SOUTH 79° 52' EAST A DISTANCE OF 622.29 FEET;  
THENCE SOUTH 10° 08' WEST A DISTANCE OF 210 FEET;  
THENCE NORTH 79° 52' WEST A DISTANCE OF 622.29 FEET;  
THENCE NORTH 10° 08' EAST A DISTANCE OF 210 FEET MORE OR LESS, TO THE TRUE POINT OF BEGINNING; AND

EXCEPT THAT PORTION OF THE NORTH HALF OF THE NORTH HALF OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 13 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF SAID SECTION 35;  
THENCE ALONG THE NORTH LINE OF SAID SECTION 35, SOUTH 89° 51' 44" EAST 3764.11 FEET;  
THENCE SOUTH 0° 00' 15" EAST 1021.80 FEET TO THE EXISTING NORTHERLY RIGHT OF WAY LINE OF INTERSTATE HIGHWAY 40 (FLAGSTAFF HOLBROOK HIGHWAY);  
THENCE ALONG SAID EXISTING HIGHWAY RIGHT OF WAY LINE OF THE FOLLOWING THREE COURSES:

- (1) NORTH 79° 52' 00" WEST 350.00 FEET;
- (2) SOUTH 70° 18' 22" WEST 864.52 FEET;
- (3) NORTH 79° 52' 00" WEST 2646.41 FEET TO THE WEST LINE OF SAID SECTION 35;

THENCE ALONG SAID WEST SECTION LINE NORTH 0° 02' 25" WEST 794.99 FEET TO THE POINT OF BEGINNING; AND

EXCEPT THAT PORTION OF THE EAST HALF OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 13 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE POINT OF INTERSECTION OF THE EXISTING SOUTHERLY RIGHT OF WAY LINE OF INTERSTATE HIGHWAY 40 (FLAGSTAFF-HOLBROOK HIGHWAY) WITH THE EAST LINE OF SAID SECTION 35, WHICH POINT IS SOUTH 0° 00' 15" EAST 2091.92 FEET FROM THE NORTHEAST CORNER OF SAID SECTION 35;  
THENCE ALONG THE AFORESAID EAST LINE OF SECTION 35, SOUTH 0° 00' 15" EAST 639.33 FEET TO THE EXISTING NORTHERLY LINE OF THE 200.00 FOOT RIGHT OF WAY OF THE A.T.&S.F. RAILWAY COMPANY;  
THENCE ALONG SAID NORTHERLY RIGHT OF WAY LINE NORTH 84° 12' 45" WEST 1728.49 FEET;  
THENCE NORTH 0° 00' 15" WEST 376.59 FEET TO THE AFORESAID EXISTING SOUTHERLY RIGHT OF WAY LINE OF INTERSTATE HIGHWAY 40;  
THENCE ALONG SAID HIGHWAY RIGHT OF WAY LINE THE FOLLOWING FOUR COURSES:

- (1) SOUTH 79° 52' 00" EAST 35.00 FEET;
- (2) NORTH 72° 20' 34" EAST 836.48 FEET;
- (3) SOUTH 79° 52' 00" EAST 739.40 FEET;
- (4) ALONG A CURVE TO THE RIGHT HAVING A RADIUS OF 34,227.48 FEET, A DISTANCE OF 162.87 FEET TO THE POINT OF BEGINNING;

AND FURTHER EXCEPTING THEREFROM ANY PORTION LYING WITHIN INTERSTATE HIGHWAY 40 AS SET FORTH IN FINAL ORDER OF CONDEMNATION RECORDED MAY 29, 1974 IN DOCKET 507, PAGE 476, AND IN DOCKET 507, PAGE 520, RECORDS OF COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 9:

THE EAST HALF OF THE SOUTHWEST QUARTER; THE SOUTHEAST QUARTER OF THE NORTHWEST

QUARTER; THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER, THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER, ALL IN SECTION 7, TOWNSHIP 20 NORTH, RANGE 14 EAST, GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT ANY PORTION LYING WITHIN THE WINSLOW-GRAY MOUNTAIN HIGHWAY, AS SET FORTH IN FINAL ORDER OF CONDEMNATION RECORDED IN DOCKET 576, PAGE 21, RECORDS OF COCONINO COUNTY, ARIZONA;

AND EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS, AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, AND BOOK 25 OF OFFICIAL RECORDS, PAGE 494, AND BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 10:

THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 7, TOWNSHIP 20 NORTH, RANGE 14 EAST, GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT ANY PORTION LYING WITHIN THE WINSLOW-GRAY MOUNTAIN HIGHWAY, AS SET FORTH IN FINAL ORDER OF CONDEMNATION RECORDED IN DOCKET 576, PAGE 21, RECORDS OF COCONINO COUNTY, ARIZONA;

AND EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS, AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, AND BOOK 25 OF OFFICIAL RECORDS, PAGE 494, AND BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 11:

THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 19, TOWNSHIP 20 NORTH, RANGE 14 EAST; OF THE GILA AND SALT RIVER BASE AND COCONINO, MARICOPA COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 12:

THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 11, TOWNSHIP 20 NORTH, RANGE 13 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 13:

THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 13, TOWNSHIP 20 NORTH, RANGE 13 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 14:

THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 13, TOWNSHIP 20 NORTH, RANGE 13 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 15:

THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 13, TOWNSHIP 20 NORTH, RANGE 13 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 16

THE SOUTHEAST CORNER OF THE NORTHEAST QUARTER OF SECTION 15, TOWNSHIP 20 NORTH, RANGE 13 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 17:

THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 17, TOWNSHIP 20 NORTH, RANGE 13 EAST, GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS, AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, AND BOOK 25 OF OFFICIAL RECORDS, PAGE 494, AND BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 18:

THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 17, TOWNSHIP 20 NORTH, RANGE 13 EAST, GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS, AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, AND BOOK 25 OF OFFICIAL RECORDS, PAGE 494, AND BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 19:

THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 17, TOWNSHIP 20 NORTH, RANGE 13 EAST, GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS, AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, AND BOOK 25 OF OFFICIAL RECORDS,

PAGE 494, AND BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 20:

THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 17, TOWNSHIP 20 NORTH, RANGE 13 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST IN ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 21:

THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 17, TOWNSHIP 20 NORTH, RANGE 13 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST IN ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 22:

THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 1, TOWNSHIP 20 NORTH, RANGE 12 ½ EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST IN ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 23:

THE WEST HALF OF THE SOUTHWEST QUARTER OF SECTION 1, TOWNSHIP 20 NORTH, RANGE 12 ½ EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST IN ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA; AND

EXCEPT ALL COAL, OIL, GAS AND MINERALS AS RESERVED IN INSTRUMENT RECORDED AUGUST 18, 1970 IN DOCKET 365, PAGE 225, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 24:

THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER, AND THE EAST HALF OF THE SOUTHWEST QUARTER OF SECTION 1, TOWNSHIP 20 NORTH, RANGE 12 ½ EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT THE NORTH, SOUTH, EAST AND WEST 15 FEET, AS CONVEYED TO COCONINO COUNTY BY DEED RECORDED IN DOCKET 425, PAGE 291.

EXCEPT 15/16TH INTEREST IN ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN

INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 25:

THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 1, TOWNSHIP 20 NORTH, RANGE 12 1/2 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST IN ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 26:

LOT 1, AND THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 7, TOWNSHIP 20 NORTH, RANGE 13 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST IN ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 27:

LOT 4 OF SECTION 7, TOWNSHIP 20 NORTH, RANGE 13 EAST, GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS, AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, AND BOOK 25 OF OFFICIAL RECORDS, PAGE 494, AND BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 28:

THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 7, TOWNSHIP 20 NORTH, RANGE 13 EAST, GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS, AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, AND BOOK 25 OF OFFICIAL RECORDS, PAGE 494, AND BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 29:

THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 7, TOWNSHIP 20 NORTH, RANGE 13 EAST, GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA;

EXCEPT 15/16TH INTEREST OF ALL OIL, GAS, HYDROCARBON AND MINERALS, AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, AND BOOK 25 OF OFFICIAL RECORDS, PAGE 494, AND BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 30:

LOTS 1, 5 AND 9, OF POSEN RANCH, A SUBDIVISION OF SECTION 33, TOWNSHIP 20 NORTH, RANGE 14 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA, ACCORDING TO THE PLAT OF RECORD IN THE OFFICE OF THE COUNTY RECORDER OF COCONINO COUNTY, ARIZONA, RECORDED IN BOOK 4 OF SURVEYS, PAGE 95;

EXCEPT 15/16TH INTEREST IN ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL NO. 31:

LOTS 1, 2, 3, 4 AND 8, OF LITTLE RED-GAP RANCH, BEING A PORTION OF SECTION 17, TOWNSHIP 20 NORTH, RANGE 14 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCONINO COUNTY, ARIZONA, ACCORDING TO THE PLAT OF RECORD IN THE OFFICE OF THE COUNTY RECORDER OF COCONINO COUNTY, ARIZONA, RECORDED IN BOOK 5 OF SURVEYS, PAGE 36;

EXCEPT 15/16TH INTEREST IN ALL OIL, GAS, HYDROCARBON AND MINERALS AS RESERVED IN INSTRUMENTS RECORDED IN BOOK 68 OF DEEDS, PAGE 322, BOOK 25 OF OFFICIAL RECORDS, PAGE 494, BOOK 46 OF OFFICIAL RECORDS, PAGE 475, AND IN DOCKET 296, PAGE 57, RECORDS OF COCONINO COUNTY, ARIZONA;  
AND

EXCEPT ALL COAL, OIL, GAS AND MINERALS AS RESERVED IN INSTRUMENT RECORDED APRIL 11, 1968 IN DOCKET 302, PAGE 343, RECORDS OF COCONINO COUNTY, ARIZONA.

PARCEL OF APPROXIMATELY 46.6 ACRES

Lot 5, Section 7, Township 20 North, Range 13 East, of the Gila and Salt River Base and Meridian, Coconino County, Arizona. Parcel # 406-75-003A.

**Exhibit 8.2.1.1D**

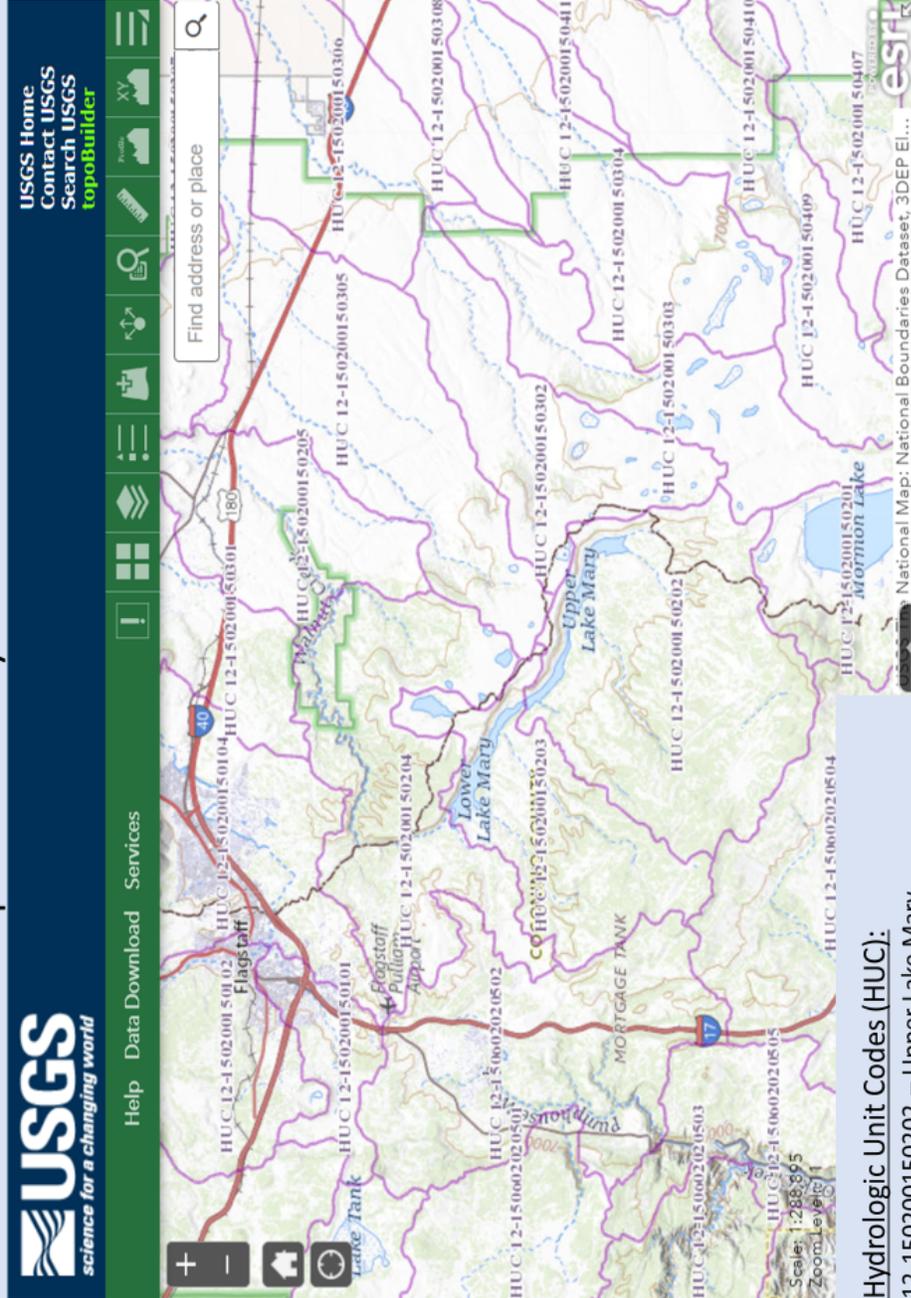
## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Upper & Lower Lake Mary		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	U.S. Forest Service
3.	<b>Completion Date</b>	Lower Lake Mary - December 31, 1903 Upper Lake Mary - December 31, 1941
4.	<b>Statement of Claimant No.(s).</b>	39-03-83948; 39-03-83949
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	Pre-1919; State law; CWRs1984 and 3998; 1974 Water Rights Registration Act Registry No. 36-104752; U.S. Forest Service Special Use Permit October 19, 2004
8.	<b>Beneficial Use</b>	Municipal & Industrial; recreation, fish, wildlife
9.	<b>Priority Date</b>	December 31, 1903
10.	<b>Storage Capacity</b>	Lower Lake Mary: 8,617 AF Upper Lake Mary: 16,575 AF
11.	<b>Quantity</b>	Historic use includes combined operation for continuous fill; maximum diversion 10,035 AFY
12.	<b>Places of Use</b>	City of Flagstaff Service Area
13.	<b>Points of Diversion</b>	NE SE 18 T20N R8E (Lower Lake Mary) SW SE 27, T20N, R8E (Upper Lake Mary)
14.	<b>Source of Water</b>	Surface Water – Lake Mary watershed - Walnut Creek
15.	<b>Comments</b>	Combined Storage Right: 25,192 AF; Lower Lake Mary constructed in 1903; Upper Lake Mary constructed in 1941 and enlarged in 1951



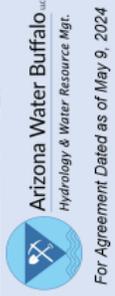
# Northeastern Arizona Indian Water Rights Settlement Abstract for the City of Flagstaff Surface Water

## Map of Lake Mary Watershed



### Hydrologic Unit Codes (HUC):

- 12-150200150202 – Upper Lake Mary
- 12-150200150203 – Lower Lake Mary
- 12-150200150204 – downstream of Lower Lake Mary



Basemap Image from the United States Geological Survey

For Agreement Dated as of May 9, 2024

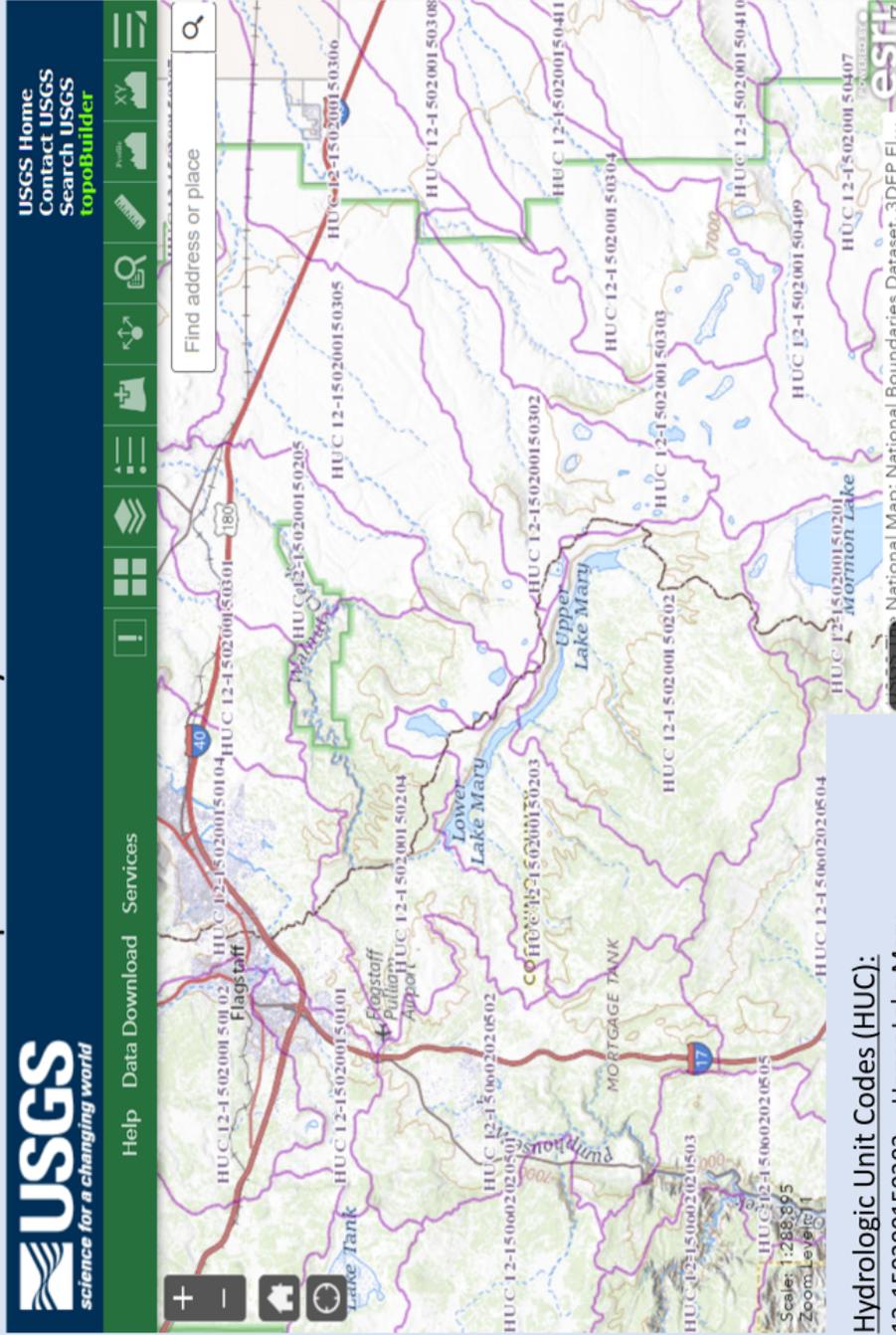
## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Upper Lake Mary		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	U.S. Forest Service
3.	<b>Completion Date</b>	December 31, 1941
4.	<b>Statement of Claimant No.(s).</b>	39-03-83948; 39-03-83949
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	Pre-1919; State law; CWRs 1984 and 3998; 1974 Water Rights Registration Act Registry No. 36-104752; U.S. Forest Service Special Use Permit October 19, 2004
8.	<b>Beneficial Use</b>	Municipal & Industrial; recreational, fish, wildlife
9.	<b>Priority Date</b>	December 31, 1903
10.	<b>Storage Capacity</b>	16,575 AF; continuous fill
11.	<b>Quantity</b>	6,966.3 AFY
12.	<b>Places of Use</b>	City of Flagstaff Service Area
13.	<b>Points of Diversion</b>	SW SE 27 T20N, R8E
14.	<b>Source of Water</b>	Surface Water – Lake Mary watershed - Walnut Creek
15.	<b>Comments</b>	Lower Lake Mary constructed in 1903; Upper Lake Mary constructed in 1941 and enlarged in 1951; Operation of Lower Lake Mary diversions are from Upper Lake Mary

# Northeastern Arizona Indian Water Rights Settlement Abstract for the City of Flagstaff Surface Water



## Map of Lake Mary Watershed



### Hydrologic Unit Codes (HUC):

- 12-150200150202 – Upper Lake Mary
- 12-150200150203 – Lower Lake Mary
- 12-150200150204 – downstream of Lower Lake Mary

Basemap image from the United States Geological Survey



Arizona Water Buffalo  
Hydrology & Water Resource Mgt.

For Agreement Dated as of May 9, 2024

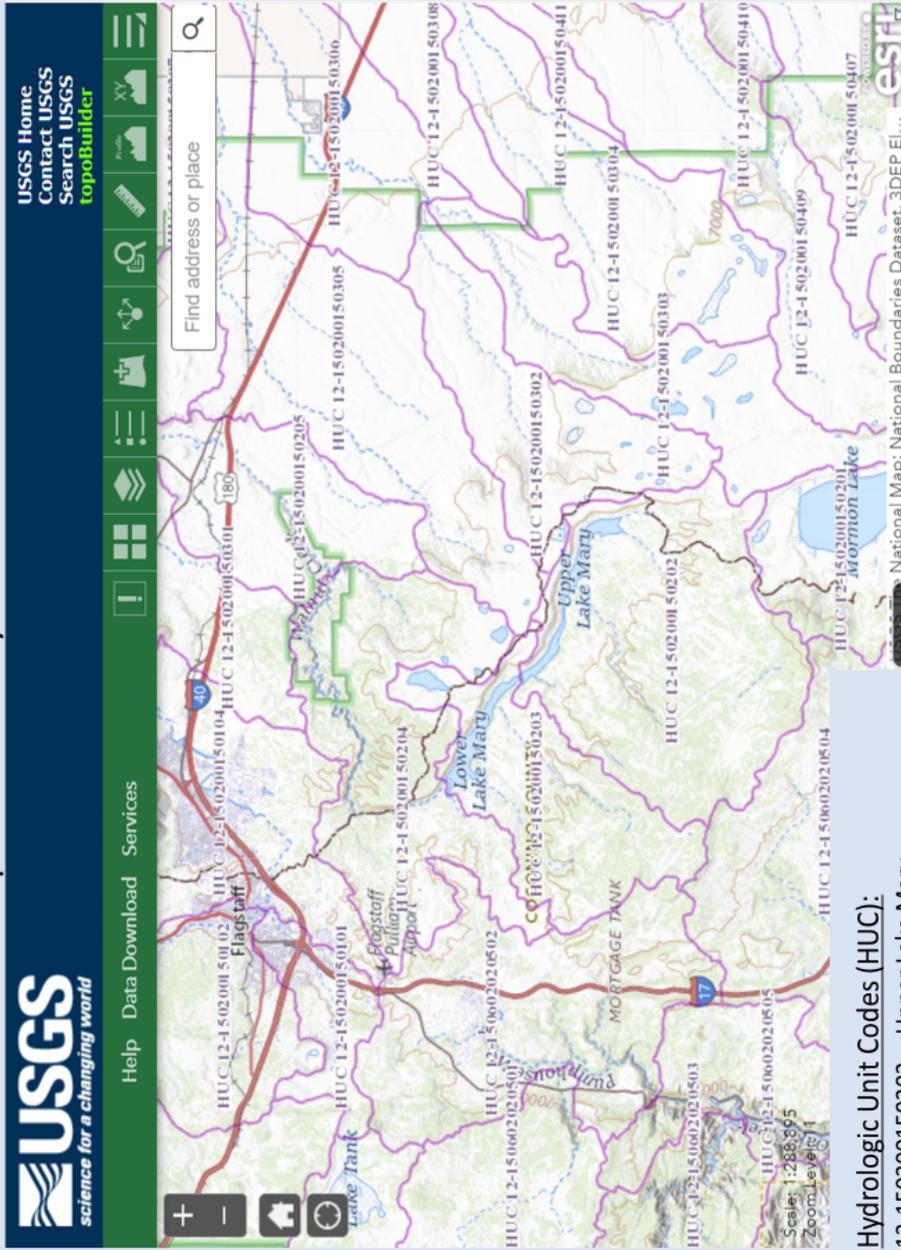
## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Lower Lake Mary		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	U.S. Forest Service
3.	<b>Completion Date</b>	December 31, 1903
4.	<b>Statement of Claimant No.(s).</b>	39-03-83948; 39-03-83949
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	Pre-1919; State law; CWRs 1984 and 3998; 1974 Water Rights Registration Act Registry No. 36-104752; Permit Application 33-87178; U.S. Forest Service Special Use Permit October 19, 2004
8.	<b>Beneficial Use</b>	Municipal & Industrial, recreational, fish, wildlife
9.	<b>Priority Date</b>	December 31, 1903
10.	<b>Storage Capacity</b>	8,617 AF; continuous fill
11.	<b>Quantity</b>	3,068.8 AFY
12.	<b>Places of Use</b>	City of Flagstaff Service Area
13.	<b>Points of Diversion</b>	SE 18 T20N, R8E; Upper Lake Mary
14.	<b>Source of Water</b>	Surface Water – Lake Mary watershed - Walnut Creek
15.	<b>Comments</b>	Lower Lake Mary constructed in 1903; Upper Lake Mary constructed in 1941 and enlarged in 1951; Lower Lake Mary diversions are from Upper Lake Mary

# Northeastern Arizona Indian Water Rights Settlement Abstract for the City of Flagstaff Surface Water



## Map of Lake Mary Watershed



**Hydrologic Unit Codes (HUC):**  
12-150200150202 – Upper Lake Mary  
12-150200150203 – Lower Lake Mary  
12-150200150204 – downstream of Lower Lake Mary

Basemap Image from the United States Geological Survey

Arizona Water Buffalo  
Hydrology & Water Resource Mgt.  
For Agreement Dated as of May 9, 2024

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Arnold Canyon San Francisco Peaks Spring		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	U.S. Forest Service
3.	<b>Priority Date</b>	December 31, 1880
4.	<b>Statement of Claimant No.(s).</b>	39-03-83949
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	Pre-1919; State law; CWR 3922; Water Rights Registration Act Registry No. 36-105002; U.S. Forest Service Special Use Permit October 19, 2004
8.	<b>Beneficial Use</b>	Municipal & Industrial
9.	<b>Quantity Flow Rate/Volume</b>	30.69 AFY
10.	<b>Places of Use</b>	City of Flagstaff Service Area
11.	<b>Points of Diversion</b>	NE NW 28 T22N, R7E
12.	<b>Source of Water</b>	Surface Water
13.	<b>Comments</b>	<p>1880 – The year in which the City of Flagstaff's predecessors-in-interest began developing the San Francisco Peaks watershed as a source of supply, including the appropriation of water sources in the Inner Basin watershed</p> <p>1895 – The year in which the City of Flagstaff furthered plans for a San Francisco Peaks pipeline to provide a municipal water supply</p>

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Beard Canyon San Francisco Peaks Spring		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	U.S. Forest Service
3.	<b>Priority Date</b>	December 31, 1880
4.	<b>Statement of Claimant No.(s).</b>	39-03-83949
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	Pre-1919; State law; CWR 3923; Water Rights Registration Act Registry No. 36-105002; U.S. Forest Service Special Use Permit October 19, 2004
8.	<b>Beneficial Use</b>	Municipal & Industrial
9.	<b>Quantity Flow Rate/Volume</b>	33.45 AFY
10.	<b>Places of Use</b>	City of Flagstaff Service Area
11.	<b>Points of Diversion</b>	NW SW 28 T23N, R7E
12.	<b>Source of Water</b>	Surface Water
13.	<b>Comments</b>	<p>1880 – The year in which the City of Flagstaff's predecessors-in-interest began developing the San Francisco Peaks watershed as a source of supply, including the appropriation of water sources in the Inner Basin watershed</p> <p>1895 – The year in which the City of Flagstaff furthered plans for a San Francisco Peaks pipeline to provide a municipal water supply</p>

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Little Bear Paw San Francisco Peaks Spring		
<b>1.</b>	<b>Owner</b>	City of Flagstaff
<b>2.</b>	<b>Landowner</b>	U.S. Forest Service
<b>3.</b>	<b>Priority Date</b>	December 31, 1880
<b>4.</b>	<b>Statement of Claimant No.(s).</b>	39-03-83949
<b>5.</b>	<b>Statement of Claimant Names</b>	City of Flagstaff
<b>6.</b>	<b>Lessee or Permittee</b>	n/a
<b>7.</b>	<b>Basis of Right</b>	Pre-1919; State law; CWR 3924; Water Rights Registration Act Registry No. 36-105002; U.S. Forest Service Special Use Permit October 19, 2004
<b>8.</b>	<b>Beneficial Use</b>	Municipal & Industrial
<b>9.</b>	<b>Quantity Flow Rate/Volume</b>	85.01 AFY
<b>10.</b>	<b>Places of Use</b>	City of Flagstaff Service Area
<b>11.</b>	<b>Points of Diversion</b>	SE SW 28 T23N, R7E
<b>12.</b>	<b>Source of Water</b>	Surface Water
<b>13.</b>	<b>Comments</b>	<p>1880 – The year in which the City of Flagstaff's predecessors-in-interest began developing the San Francisco Peaks watershed as a source of supply, including the appropriation of water sources in the Inner Basin watershed</p> <p>1895 – The year in which the City of Flagstaff furthered plans for a San Francisco Peaks pipeline to provide a municipal water supply</p>

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Dunnam Canyon San Francisco Peaks Spring		
<b>1.</b>	<b>Owner</b>	City of Flagstaff
<b>2.</b>	<b>Landowner</b>	U.S. Forest Service
<b>3.</b>	<b>Priority Date</b>	December 31, 1880
<b>4.</b>	<b>Statement of Claimant No.(s).</b>	39-03-83949
<b>5.</b>	<b>Statement of Claimant Names</b>	City of Flagstaff
<b>6.</b>	<b>Lessee or Permittee</b>	n/a
<b>7.</b>	<b>Basis of Right</b>	Pre-1919; State law; CWR 3925; Water Rights Registration Act Registry No. 36-105002; U.S. Forest Service Special Use Permit October 19, 2004
<b>8.</b>	<b>Beneficial Use</b>	Municipal & Industrial
<b>9.</b>	<b>Quantity Flow Rate/Volume</b>	26.39 AFY
<b>10.</b>	<b>Places of Use</b>	City of Flagstaff Service Area
<b>11.</b>	<b>Points of Diversion</b>	SE SE 29 T23N, R7E
<b>12.</b>	<b>Source of Water</b>	Surface Water
<b>13.</b>	<b>Comments</b>	<p>1880 – The year in which the City of Flagstaff’s predecessors-in-interest began developing the San Francisco Peaks watershed as a source of supply, including the appropriation of water sources in the Inner Basin watershed</p> <p>1895 – The year in which the City of Flagstaff furthered plans for a San Francisco Peaks pipeline to provide a municipal water supply</p>

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Flagstaff Spring Canyon San Francisco Peaks Spring		
<b>1.</b>	<b>Owner</b>	City of Flagstaff
<b>2.</b>	<b>Landowner</b>	U.S. Forest Service
<b>3.</b>	<b>Priority Date</b>	December 31, 1880
<b>4.</b>	<b>Statement of Claimant No.(s).</b>	39-03-83949
<b>5.</b>	<b>Statement of Claimant Names</b>	City of Flagstaff
<b>6.</b>	<b>Lessee or Permittee</b>	n/a
<b>7.</b>	<b>Basis of Right</b>	Pre-1919; State law; CWR 3926; Water Rights Registration Act Registry No. 36-105002; U.S. Forest Service Special Use Permit October 19, 2004
<b>8.</b>	<b>Beneficial Use</b>	Municipal & Industrial
<b>9.</b>	<b>Quantity Flow Rate/Volume</b>	159.58 AFY
<b>10.</b>	<b>Places of Use</b>	City of Flagstaff Service Area
<b>11.</b>	<b>Points of Diversion</b>	NE NE 32 T23N, R7E
<b>12.</b>	<b>Source of Water</b>	Surface Water
<b>13.</b>	<b>Comments</b>	<p>1880 – The year in which the City of Flagstaff's predecessors-in-interest began developing the San Francisco Peaks watershed as a source of supply, including the appropriation of water sources in the Inner Basin watershed</p> <p>1895 – The year in which the City of Flagstaff furthered plans for a San Francisco Peaks pipeline to provide a municipal water supply</p>

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Snowslide Canyon Diversion No. 1 San Francisco Peaks Spring		
<b>1.</b>	<b>Owner</b>	City of Flagstaff
<b>2.</b>	<b>Landowner</b>	U.S. Forest Service
<b>3.</b>	<b>Priority Date</b>	December 31, 1880
<b>4.</b>	<b>Statement of Claimant No.(s).</b>	39-03-83949
<b>5.</b>	<b>Statement of Claimant Names</b>	City of Flagstaff
<b>6.</b>	<b>Lessee or Permittee</b>	n/a
<b>7.</b>	<b>Basis of Right</b>	Pre-1919; State law; CWR 3927; Water Rights Registration Act Registry No. 36-105002; U.S. Forest Service Special Use Permit October 19, 2004
<b>8.</b>	<b>Beneficial Use</b>	Municipal & Industrial
<b>9.</b>	<b>Quantity Flow Rate/Volume</b>	12.28 AFY
<b>10.</b>	<b>Places of Use</b>	City of Flagstaff Service Area
<b>11.</b>	<b>Points of Diversion</b>	SE NE 32 T23N, R7E
<b>12.</b>	<b>Source of Water</b>	Surface Water
<b>13.</b>	<b>Comments</b>	<p>1880 – The year in which the City of Flagstaff's predecessors-in-interest began developing the San Francisco Peaks watershed as a source of supply, including the appropriation of water sources in the Inner Basin watershed</p> <p>1895 – The year in which the City of Flagstaff furthered plans for a San Francisco Peaks pipeline to provide a municipal water supply</p>

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Doyle Canyon Diversion No. 3 San Francisco Peaks Spring		
<b>1.</b>	<b>Owner</b>	City of Flagstaff
<b>2.</b>	<b>Landowner</b>	U.S. Forest Service
<b>3.</b>	<b>Priority Date</b>	December 31, 1880
<b>4.</b>	<b>Statement of Claimant No.(s).</b>	39-03-83949
<b>5.</b>	<b>Statement of Claimant Names</b>	City of Flagstaff
<b>6.</b>	<b>Lessee or Permittee</b>	n/a
<b>7.</b>	<b>Basis of Right</b>	Pre-1919; State law; CWR 3928; Water Rights Registration Act Registry No. 36-105002; U.S. Forest Service Special Use Permit October 19, 2004
<b>8.</b>	<b>Beneficial Use</b>	Municipal & Industrial
<b>9.</b>	<b>Quantity Flow Rate/Volume</b>	92.07 AFY
<b>10.</b>	<b>Places of Use</b>	City of Flagstaff Service Area
<b>11.</b>	<b>Points of Diversion</b>	SW SE 33 T23N, R7E
<b>12.</b>	<b>Source of Water</b>	Surface Water
<b>13.</b>	<b>Comments</b>	<p>1880 – The year in which the City of Flagstaff's predecessors-in-interest began developing the San Francisco Peaks watershed as a source of supply, including the appropriation of water sources in the Inner Basin watershed</p> <p>1895 – The year in which the City of Flagstaff furthered plans for a San Francisco Peaks pipeline to provide a municipal water supply</p>

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Snowslide Canyon Diversion No. 2 San Francisco Peaks Spring		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	U.S. Forest Service
3.	<b>Priority Date</b>	December 31, 1880
4.	<b>Statement of Claimant No.(s).</b>	39-03-83949
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	Pre-1919; State law; CWR 3929; Water Rights Registration Act Registry No. 36-105002; U.S. Forest Service Special Use Permit October 19, 2004
8.	<b>Beneficial Use</b>	Municipal & Industrial
9.	<b>Quantity Flow Rate/Volume</b>	61.38 AFY
10.	<b>Places of Use</b>	City of Flagstaff Service Area
11.	<b>Points of Diversion</b>	NE SE 32 T23N, R7E
12.	<b>Source of Water</b>	Surface Water
13.	<b>Comments</b>	<p>1880 – The year in which the City of Flagstaff's predecessors-in-interest began developing the San Francisco Peaks watershed as a source of supply, including the appropriation of water sources in the Inner Basin watershed</p> <p>1895 – The year in which the City of Flagstaff furthered plans for a San Francisco Peaks pipeline to provide a municipal water supply</p>

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

San Francisco Mountain Area		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	U.S. Forest Service
3.	<b>Priority Date</b>	December 31, 1880
4.	<b>Statement of Claimant No.(s).</b>	39-03-83949
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	Pre-1919; State law; CWR 1983; Water Rights Registration Act Registry No. 36-105002; U.S. Forest Service Special Use Permit October 19, 2004
8.	<b>Beneficial Use</b>	Municipal & Industrial
9.	<b>Quantity Flow Rate/Volume</b>	1,461.4 AFY
10.	<b>Places of Use</b>	City of Flagstaff Service Area
11.	<b>Points of Diversion</b>	San Francisco Mountain Area includes Hoffman Canyon, Jack Canyon, Snowslide Canyon, Flagstaff Canyon, Little Bear Paw Canyon, Raspberry Canyon, Doyle Canyon, Arnold Canyon, Schultz Fork No. 1 Canyon, Mexican Mine Canyon, Big O'Brien Canyon, Little O'Brien Canyon, South Spruce Canyon, Freidlein Canyon, Freidlein Tank Canyon, Little Friedlein Canyon, Double Freidlein Canyon, East Freidlein Canyon, Powers Draw, Weatherford Canyon, East Weatherford Canyon, South Fork Sheep Dip Canyon, Sheep Dip Canyon, Barrel Canyon, Bear Canyon, Orion Springs, Bear Jaw Canyon, Ree's Canyon, Aubineau Canyon, Schultz Canyon, Brookbank Canyon, O'Hara Spring, Spencer Canyon, Beard Canyon, Dunnam Canyon and Flagstaff Spring Canyon
12.	<b>Source of Water</b>	Surface Water

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

13.	<b>Comments</b>	<p>1880 – The year in which the City of Flagstaff’s predecessors-in-interest began developing the San Francisco Peaks watershed as a source of supply, including the appropriation of water sources in the Inner Basin watershed</p> <p>1895 – The year in which the City of Flagstaff furthered plans for a San Francisco Peaks pipeline to provide a municipal water supply</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;"><u>Diversion Name</u></th> <th style="text-align: left; border-bottom: 1px solid black;"><u>Legal Location (G&amp;SRB&amp;M)</u></th> </tr> </thead> <tbody> <tr><td>Hoffman Canyon</td><td>NESW Sec. 27, T23N, R7E</td></tr> <tr><td>Jack Smith Canyon #1</td><td>NESW Sec. 27, T23N, R7E</td></tr> <tr><td>Jack Smith Canyon #2</td><td>NWSW Sec. 27, T23N, R7E</td></tr> <tr><td>Jack Smith Canyon #3</td><td>SESE Sec. 29, T23N, R7E</td></tr> <tr><td>Little Bear Paw Canyon</td><td>SESW Sec. 28, T23N, R7E</td></tr> <tr><td>Beard Canyon</td><td>SESW Sec. 28, T23N, R7E</td></tr> <tr><td>Flagstaff Canyon #1 &amp; 2</td><td>SESE Sec. 29, T23N, R7E</td></tr> <tr><td>Dunnam Canyon #1</td><td>SESE Sec. 29, T23N, R7E</td></tr> <tr><td>Raspberry Canyon #1</td><td>SWSW Sec. 27, T23N, R7E</td></tr> <tr><td>Raspberry Canyon #2,3 &amp; 4</td><td>SESE Sec. 28, T23N, R7E</td></tr> <tr><td>Doyle Canyon #1 &amp; 2</td><td>NESW Sec. , T23N, R7E</td></tr> <tr><td>Arnold Canyon</td><td>NENW Sec. 28, T22N, R7E</td></tr> <tr><td>Schultz Fork #1</td><td>SESW Sec. 21, T22N, R7E</td></tr> <tr><td>Mexican Mine Canyon</td><td>SESW Sec. 21, T22N, R7E</td></tr> <tr><td>Big O'Brien Canyon</td><td>NWSW Sec. 22, T22N, R7E</td></tr> <tr><td>Little O'Brien Canyon</td><td>NWSW Sec. 22, T22N, R7E</td></tr> <tr><td>South Spruce Canyon</td><td>NENW Sec. 22, T22N, R7E</td></tr> <tr><td>Freidlein Canyon</td><td>SWSE Sec. 7, T22N, R7E</td></tr> <tr><td>Freidlein Tank Canyon</td><td>NWNE Sec. 18, T22N, R7E</td></tr> </tbody> </table>	<u>Diversion Name</u>	<u>Legal Location (G&amp;SRB&amp;M)</u>	Hoffman Canyon	NESW Sec. 27, T23N, R7E	Jack Smith Canyon #1	NESW Sec. 27, T23N, R7E	Jack Smith Canyon #2	NWSW Sec. 27, T23N, R7E	Jack Smith Canyon #3	SESE Sec. 29, T23N, R7E	Little Bear Paw Canyon	SESW Sec. 28, T23N, R7E	Beard Canyon	SESW Sec. 28, T23N, R7E	Flagstaff Canyon #1 & 2	SESE Sec. 29, T23N, R7E	Dunnam Canyon #1	SESE Sec. 29, T23N, R7E	Raspberry Canyon #1	SWSW Sec. 27, T23N, R7E	Raspberry Canyon #2,3 & 4	SESE Sec. 28, T23N, R7E	Doyle Canyon #1 & 2	NESW Sec. , T23N, R7E	Arnold Canyon	NENW Sec. 28, T22N, R7E	Schultz Fork #1	SESW Sec. 21, T22N, R7E	Mexican Mine Canyon	SESW Sec. 21, T22N, R7E	Big O'Brien Canyon	NWSW Sec. 22, T22N, R7E	Little O'Brien Canyon	NWSW Sec. 22, T22N, R7E	South Spruce Canyon	NENW Sec. 22, T22N, R7E	Freidlein Canyon	SWSE Sec. 7, T22N, R7E	Freidlein Tank Canyon	NWNE Sec. 18, T22N, R7E
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Freidlein Tank Canyon	NWNE Sec. 18, T22N, R7E																																									

# ABSTRACT FOR THE CITY OF FLAGSTAFF

## Surface Water

	Little Freidlein Canyon	NENE Sec. 18, T22N, R7E
	Double Freidlein Canyon	NENE Sec. 18, T22N, R7E
	East Freidlein Canyon	SWNW Sec. 17, T22N, R7E
	Powers Draw	SWNW Sec. 14, T22N, R7E
	Weatherford Canyon	NWNW Sec. 14, T22N, R7E
	East Weatherford Canyon	NWNW Sec. 14, T22N, R7E
	South Fork Sheep Dip Canyon	SENW Sec. 2, T22N, R7E
	Sheep Dip Canyon	NENW Sec. 2, T22N, R7E
	Barrel Canyon	NWSE Sec. 35, T23N, R7E
	Bear Canyon	SESW Sec. 26, T23N, R7E
	Orion Springs	SWNE Sec. 15, T22N, R7E
	Bear Paw Canyon	NENW Sec. 21, T23N, R7E
	Ree's Canyon	SWNW Sec. 21, T23N, R7E
	Aubineau Canyon #1,2 & 3	NWNE Sec. 29, T23N, R7E
	Aubineau Canyon #4	SWNE Sec. 29, T23N, R7E
	Aubineau Canyon #5	SWSE Sec. 20, T23N, R7E
	Schultz Canyon #1	NESW Sec. 33, T22N, R7E
	Schultz Canyon #2	NWNE Sec. 28, T22N, R7E
	Schultz Canyon #3	NENW Sec. 22, T22N, R7E
	Schultz Canyon #4	SWSE Sec. 15, T22N, R7E
	Brookbank Canyon	NWNE Sec. 22, T22N, R7E
	O'Hara Spring	SWNE Sec. 15, T22N, R7E
	Spencer Canyon	NESW Sec. 20, T23N, R7E
	Little Bear Paw Canyon	SESW Sec. 28, T23N, R7E

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Pezzonico		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	August 31, 1954
4.	<b>Statement of Claimant No.(s).</b>	39-03-80002
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1977 Stockpond Reg. Act Claim No. 22612
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	1 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	NE SW NE 01 T20N R12E
12.	<b>Source of Water</b>	Surface Water - Atchison Wash
13.	<b>Comments</b>	Stockpond 100-foot maximum length, Filed 11-23-1981

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Frye		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	August 31, 1954
4.	<b>Statement of Claimant No.(s).</b>	39-03-80003
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1977 Stockpond Registration Act Claim No. 22611
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	1.25 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	NE NW 01 T20N R12.5E
12.	<b>Source of Water</b>	Surface Water - Atchison Wash
13.	<b>Comments</b>	Stockpond; 5-foot-high dam; 125 foot maximum length; Filed 11-23-1981

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Armijo Dam		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	December 31, 1910
4.	<b>Statement of Claimant No.(s).</b>	39-03-80004
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1974 Water Rights Registration Act Registry No. 36-22624
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	4 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	SW NE SE 01 T20N R12.5E
12.	<b>Source of Water</b>	Surface Water - Topeka Wash
13.	<b>Comments</b>	Stockpond; 10-foot-high dam; 225 ft maximum length; Book 2 Page 489 County Records; Filed 11-23-1981

**ABSTRACT FOR THE CITY OF FLAGSTAFF**  
**Surface Water**

Double Tanks		
<b>1.</b>	<b>Owner</b>	City of Flagstaff
<b>2.</b>	<b>Landowner</b>	City of Flagstaff
<b>3.</b>	<b>Priority Date</b>	Prior to December 31, 1954
<b>4.</b>	<b>Statement of Claimant No.(s).</b>	39-03-80006
<b>5.</b>	<b>Statement of Claimant Names</b>	City of Flagstaff
<b>6.</b>	<b>Lessee or Permittee</b>	n/a
<b>7.</b>	<b>Basis of Right</b>	1977 Stockponds Reg. Act Claim No. 22613
<b>8.</b>	<b>Beneficial Use</b>	Stock
<b>9.</b>	<b>Quantity Flow Rate/Volume</b>	10 AF
<b>10.</b>	<b>Places of Use</b>	Point of Delivery
<b>11.</b>	<b>Points of Diversion</b>	SE NE 15 T20N R13E
<b>12.</b>	<b>Source of Water</b>	Surface Water - Cow Canyon Wash
<b>13.</b>	<b>Comments</b>	Stockpond; Double Tanks Stockpond (two tanks together 10 ft each); 12-foot-high; maximum length 300 feet; Filed 11-23-1981

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Melbourne Tank		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	October 31, 1910
4.	<b>Statement of Claimant No.(s).</b>	39-03-80007
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1974 Water Rights Registration Act Registry No. 36-22623
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	4 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	NE SE T17 20N R13E
12.	<b>Source of Water</b>	Surface Water - Melbourne Wash
13.	<b>Comments</b>	Stockpond; 10 ft. high; 200 ft. maximum length; Filed 11-23-1981

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

King Folly		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	Arizona State Land Department
3.	<b>Priority Date</b>	August 31, 1954
4.	<b>Statement of Claimant No.(s).</b>	39-03-80008
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1977 Stockpond Reg. Act Claim No. 22610
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	1 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	NE NE 18, 20N, 13E
12.	<b>Source of Water</b>	Surface Water - Lower Sunshine Wash
13.	<b>Comments</b>	Stockpond; height 4 ft; 100 ft maximum length: Filed 11-23-1981

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Sunshine Dam		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	Arizona State Land Department
3.	<b>Priority Date</b>	February 28, 1912
4.	<b>Statement of Claimant No.(s).</b>	39-03-80009
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1977 Stockpond Reg. Act Claim No. 22625
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	10 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	NE NW 18 T20N, R13E
12.	<b>Source of Water</b>	Surface Water – Sunshine Wash
13.	<b>Comments</b>	Stockpond; 16 ft high; 55 ft maximum length; Filed 11-23-1981

**ABSTRACT FOR THE CITY OF FLAGSTAFF**  
**Surface Water**

SOS Tank		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	August 31, 1954
4.	<b>Statement of Claimant No.(s).</b>	39-03-80010
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1977 Stockpond Reg. Act Claim No. 22609
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	0.75 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	NE SW 19 T20N R13E
12.	<b>Source of Water</b>	Surface Water - Lower Sunshine Wash
13.	<b>Comments</b>	Stockpond; SOS Tank; height 3 ft; 75 ft maximum length; Filed 11-23-1981

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Opchurch/Homestead Tank		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	Pre-1919
4.	<b>Statement of Claimant No.(s).</b>	39-03-80011
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1977 Stockpond Reg. Act Claim No. 36-22622
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	12 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	SE SE 21 T20N R13E
12.	<b>Source of Water</b>	Surface Water - Beacon Wash
13.	<b>Comments</b>	Stockpond; 16 ft height 450 ft maximum length; Filed 11-23-1981

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Ambrosia Dam		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	December 31, 1910
4.	<b>Statement of Claimant No.(s).</b>	39-03-80012
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1977 Stockpond Reg. Act Claim No. 22619
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	40 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	SE NE 23 T20N R13E
12.	<b>Source of Water</b>	Surface Water - Dennison Wash
13.	<b>Comments</b>	Stockpond; 4 ft high; 600 ft maximum length; Book 2 Page 487-88 Coconino County; Filed 11-23-1981

**ABSTRACT FOR THE CITY OF FLAGSTAFF**  
**Surface Water**

Sixty Six		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	December 31, 1937
4.	<b>Statement of Claimant No.(s).</b>	39-03-80013
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1977 Stockpond Reg. Act Claim No. 22618
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	1 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	SE SE 28 T20N R13E
12.	<b>Source of Water</b>	Surface Water - Beacon Wash
13.	<b>Comments</b>	Stockpond; 8 ft high' 100 ft maximum length; Filed 11-23-1981

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Denny Tank		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	December 31, 1960
4.	<b>Statement of Claimant No.(s).</b>	39-03-80014
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1977 Stockpond Reg. Act Claim No. 22616
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	0.5 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	SW NE 34 T20N R13E
12.	<b>Source of Water</b>	Surface Water - Beacon Wash
13.	<b>Comments</b>	Stockpond; Beacon Wash; 2 ft high; 50 ft maximum length; Filed 11-23-1981

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Tamarack Tank		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	December 31, 1960
4.	<b>Statement of Claimant No.(s).</b>	39-03-80015
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1977 Stockpond Reg. Act Claim No. 22617
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	0.5 AF
10.	<b>Places of Use</b>	City of Flagstaff
11.	<b>Points of Diversion</b>	SW NW 36 T20N R13E
12.	<b>Source of Water</b>	Surface Water - Dennison Wash
13.	<b>Comments</b>	Stockpond; 2 ft high; 75 ft maximum length; Filed 11-23-1981

**ABSTRACT FOR THE CITY OF FLAGSTAFF**  
**Surface Water**

Corner Tank		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	Prior to December 31, 1954
4.	<b>Statement of Claimant No.(s).</b>	39-03-80016
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1977 Stockpond Reg. Act Claim No. 22605
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	4 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	NE NE 4 T20N R14E
12.	<b>Source of Water</b>	Surface Water - Tucker Mesa Wash
13.	<b>Comments</b>	Stockpond; 12 feet high; 150 ft maximum length; Filed 11-23-1981

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Red Gap Tank		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	Pre-1919
4.	<b>Statement of Claimant No.(s).</b>	39-03-80017
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1974 Water Rights Registration Act Registry No. 36-22621
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	1 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	NE SW 07 T20N R14E
12.	<b>Source of Water</b>	Surface Water – unnamed draw
13.	<b>Comments</b>	Stockpond; 4 ft height; 100 ft maximum length; Filed 11-23-1981

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Duce Tank		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	Prior to December 31, 1954
4.	<b>Statement of Claimant No.(s).</b>	39-03-80019
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1977 Stockpond Reg. Act Claim No. 22608
8.	<b>Beneficial Use</b>	Stockwater
10.	<b>Quantity Flow Rate/Volume</b>	4 AF
11.	<b>Places of Use</b>	Point of Delivery
12.	<b>Points of Diversion</b>	NE NE 19 T20N R14E
13.	<b>Source of Water</b>	Surface Water - Limestone Wash
14.	<b>Comments</b>	Stockpond; 10 ft high; 200 ft maximum length

**ABSTRACT FOR THE CITY OF FLAGSTAFF**  
**Surface Water**

Tom's Well Tank		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	Pre-1919
4.	<b>Statement of Claimant No.(s).</b>	39-03-80020
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1974 Water Rights Registration Act Registry No. 36-22620
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	2 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	SE SW 29 T20N R14E
12.	<b>Source of Water</b>	Surface Water - Tom's Canyon Wash
13.	<b>Comments</b>	Stockpond; 4 ft high; 150 ft maximum length; Filed 11-23-1981

**ABSTRACT FOR THE CITY OF FLAGSTAFF**  
**Surface Water**

Limestone Wash		
<b>1.</b>	<b>Owner</b>	City of Flagstaff
<b>2.</b>	<b>Landowner</b>	City of Flagstaff
<b>3.</b>	<b>Priority Date</b>	December 31, 1960
<b>4.</b>	<b>Statement of Claimant No.(s).</b>	39-03-80022
<b>5.</b>	<b>Statement of Claimant Names</b>	City of Flagstaff
<b>6.</b>	<b>Lessee or Permittee</b>	n/a
<b>7.</b>	<b>Basis of Right</b>	1977 Stockpond Reg. Act Claim No. 22607
<b>8.</b>	<b>Beneficial Use</b>	Stock
<b>9.</b>	<b>Quantity Flow Rate/Volume</b>	12 AF
<b>10.</b>	<b>Places of Use</b>	Point of Delivery
<b>11.</b>	<b>Points of Diversion</b>	SE SW 31 T20N R14E
<b>12.</b>	<b>Source of Water</b>	Surface Water - Limestone Wash
<b>13.</b>	<b>Comments</b>	Stockpond; 6 feet high; 175 feet maximum length; Filed 11-23-1981

**ABSTRACT FOR THE CITY OF FLAGSTAFF**  
**Surface Water**

High Drye		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	December 31, 1960
4.	<b>Statement of Claimant No.(s).</b>	39-03-80023
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1977 Stockpond Reg. Act Claim No. 22606
8.	<b>Beneficial Use</b>	Stock
10.	<b>Quantity Flow Rate/Volume</b>	6 AF
11.	<b>Places of Use</b>	Point of Delivery
12.	<b>Points of Diversion</b>	SW SW 33 T20N R14E
13.	<b>Source of Water</b>	Surface Water - Tom's Canyon Wash
14.	<b>Comments</b>	Stockpond; 4 ft high; 150 ft maximum length; Filed 11-23-1981

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Cheshire Estates – Rio de Flag		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	October 31, 1952
4.	<b>Statement of Claimant No.(s).</b>	CWR 2789
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	CWR 2789
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	6.55 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	NE SE NE 5 T21N R7E
12.	<b>Source of Water</b>	Surface Water – Rio de Flag
13.	<b>Comments</b>	Stockwater; Height 15 ft; 130 ft length on top; length on bottom 50 ft; Permit No R-775 Application No. R-1181; 6.55 AF storage

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Tank No. 7		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	December 27, 1882
4.	<b>Statement of Claimant No.(s).</b>	39-86721
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1974 Water Rights Registration Act - Registry No. 36-21799
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	0.50 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	SW SW 8 T21N R7E
12.	<b>Source of Water</b>	Surface Water-unnamed draw
13.	<b>Comments</b>	Stockpond; Construction-September 1983; Height 5 ft; Maximum length 123 ft; Maximum width 66 ft

**ABSTRACT FOR THE CITY OF FLAGSTAFF**  
**Surface Water**

Lang Tank		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	Prior to December 31, 1884
4.	<b>Statement of Claimant No.(s).</b>	39-86725
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1974 Water Rights Registration Act – Registry No. 36-21799
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	3.7 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	NW SE 12 T21N R6E
12.	<b>Source of Water</b>	Surface Water – Lang Wash
13.	<b>Comments</b>	Stockpond; Construction-December 1951; Maximum height 11.3 ft; Maximum length 240 ft; Maximum width 180 ft

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Lower Lang Tank		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	Prior to December 31, 1884
4.	<b>Statement of Claimant No.(s).</b>	39-86726
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1974 Water Rights Registration Act-Registry Nos. 36-21799; 38-21798
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	1.10 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	SE SW 12 T21N R6E
12.	<b>Source of Water</b>	Surface Water – Lang Wash
13.	<b>Comments</b>	Stockpond; Construction-1951; Maximum height 7.5 ft; Maximum length 126 ft; Maximum width 104 feet

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Tank No. 2		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	December 27, 1882
4.	<b>Statement of Claimant No.(s).</b>	39-86727
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1974 Water Rights Registry Act Registry No. 36-21799; CWR 33-89549
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	0.32 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	SE SE 12 T21N R6E
12.	<b>Source of Water</b>	Surface Water - Lang Draw
13.	<b>Comments</b>	Stockpond; Construction-September 1983; Maximum height 3.6 ft; Maximum length 84 ft; Maximum width 69 ft

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Dollar Mark Tank		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	Prior to December 31, 1884
4.	<b>Statement of Claimant No.(s).</b>	39-86732
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1974 Water Rights Registration Act Registry No. 36-21799
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	0.05 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	NW NE 6 T21N R7E
12.	<b>Source of Water</b>	Surface Water – unnamed draw to Rio de Flag
13.	<b>Comments</b>	Stockpond; Construction June 1952; Maximum height 5 ft; Maximum length 198 ft; Maximum width 114 ft

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

Lowell Tank		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	Prior to December 31, 1884
4.	<b>Statement of Claimant No.(s).</b>	39-86733
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1974 Water Rights Registration Act Registry No. 36-21799
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	0.20 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	NW SE NE 18 T21N R7E
12.	<b>Source of Water</b>	Surface Water-unnamed draw to Lowell Wash
13.	<b>Comments</b>	Stockpond; Construction December 1951; Maximum height 4.3 ft; Maximum length 132 ft; Maximum width 75 ft

## ABSTRACT FOR THE CITY OF FLAGSTAFF Surface Water

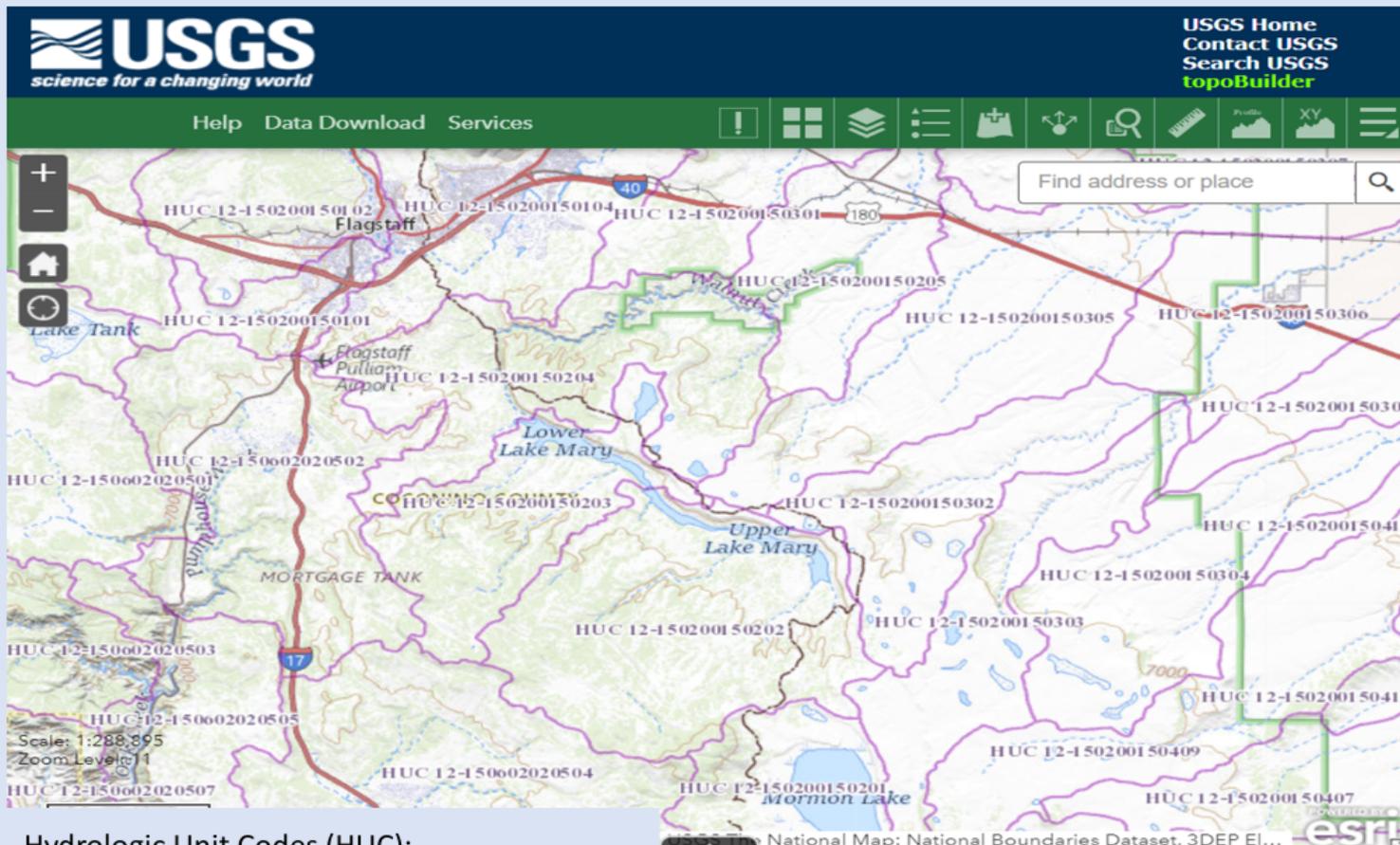
Tunnel Spring Tank		
1.	<b>Owner</b>	City of Flagstaff
2.	<b>Landowner</b>	City of Flagstaff
3.	<b>Priority Date</b>	Prior to December 31, 1884
4.	<b>Statement of Claimant No.(s).</b>	39-86735
5.	<b>Statement of Claimant Names</b>	City of Flagstaff
6.	<b>Lessee or Permittee</b>	n/a
7.	<b>Basis of Right</b>	1974 Water Rights Registration Act Registry No. 36-21799
8.	<b>Beneficial Use</b>	Stock
9.	<b>Quantity Flow Rate/Volume</b>	0.50 AF
10.	<b>Places of Use</b>	Point of Delivery
11.	<b>Points of Diversion</b>	SE SE SE 18 T21N R7E
12.	<b>Source of Water</b>	Surface Water-unnamed draw to Sante Fe Wash
13.	<b>Comments</b>	Stockpond; Construction 1951; Maximum height 6.5 ft; Maximum length 165 ft; Maximum width 57 ft

**Exhibit 8.8.3**

# Northeastern Arizona Indian Water Rights Settlement

## EXHIBIT 8.8.3

### Map of Lake Mary Watershed



#### Hydrologic Unit Codes (HUC):

- 12-150200150202 – Upper Lake Mary
- 12-150200150203 – Lower Lake Mary
- 12-150200150204 – downstream of Lower Lake Mary

Basemap Image from the United States Geological Survey



For Agreement Dated as of May 9, 2024

**ATTACHMENT B**

**ATTACHMENT B TO RESOLUTION NO. 2024-\_\_\_\_\_**

**CITY OF FLAGSTAFF EXISTING WELLS AT RED GAP RANCH**

With Pumping Capacity or Casing Size from Table in NAIWRSA Subparagraph 9.4.1

**LOCATION**

**Buffer Zone 1:**

Well Name	55#	Casing Diameter (inches)	Capacity Acre Feet/Year	Buffer Zone
RGR Well 1	590153	12	784	1
RGR Well 7	601271	5	136	1
Sunshine Well	601277	9	544	1
Outpost Well	597831	5	136	1
Lake Tank Well	590957	6	196	1
Twin Tanks Well	597832	5	136	1
Stone 1	601273	6	196	1
Stone 2	601274	6	196	1
Stone 3	601275	6	196	1
Stone 4	601272	6	196	1
Stone 5	809401	6	196	1
			<hr/> 2,912 AFY	

**Buffer Zone 2:**

RGR Well 2	590823	12	1,210	2
RGR Well 3	590338	12	1,193	2
RGR SW Well 1	912928	16	1,400	2
RGR SW Well 2	912929	16	1,400	2
RGR SW Well 3	912930	16	1,400	2
RGR SW Well 4	912931	16	1,400	2
RGR SW Well 5	912932	16	1,400	2
RGR SW Well 6	912933	16	1,400	2
RGR SW Well 7	913556	24	1,400	2
RGR SW Well 8	913557	24	1,400	2
RGR SW Well 10	913561	24	1,400	2
Red Sands Well	601276	6	up to 800	2
Cedar Well	597833	5	up to 800	2
Headquarters Well	601278	6	up to 800	2
MW-2W	590821	5	up to 800	2
MW-2S	590822	5	up to 800	2
			<hr/> 19,003 AFY	

**South of Buffer Zone 2:**

RGR SW Well 9	913560	24	Not limited	Outside
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*Agreement Dated as of May 9, 2024*

## **Northeastern Arizona Indian Water Rights**

### **Settlement Agreement**

## **1.0 INTRODUCTION**

The purpose of this Agreement is to resolve, fully and finally, any and all claims to Water from any source in the State by: the Navajo Nation on behalf of the Navajo Nation and the Members of the Navajo Nation; the Hopi Tribe on behalf of the Hopi Tribe and the Members of the Hopi Tribe; the San Juan Southern Paiute Tribe on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe; the United States acting as trustee for the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Members of the Navajo Nation, the Members of the Hopi Tribe and the Members of the San Juan Southern Paiute Tribe; and the United States acting as trustee for Navajo Allottees and Hopi Allottees.

## **2.0 PARTIES**

This Agreement dated as of this \_\_\_ day of \_\_\_\_\_, 2024, is entered into among: the United States of America; the State of Arizona; the Navajo Nation; the Hopi Tribe; the San Juan Southern Paiute Tribe; the Central Arizona Water Conservation District; the Salt River Project Agricultural Improvement and Power District; the Salt River Valley Water Users' Association; the Arizona cities and towns of Flagstaff, Winslow, Holbrook, Taylor, Snowflake, Show Low, Eagar, Springerville, and St. Johns; Arizona Public Service Co.; Bar T Bar Ranch, Inc.; Bar T Bar Ranch Company, LLP; Meteor Crater Enterprises, Inc.; Crater Ranch, LLC; Flying M Ranch, Inc.; Aztec Land and Cattle Company, Limited; Aztec Land Company, LLC; Arizona State Land Department; Arizona Game and Fish Commission; Arizona Department of Transportation; Grover's Hill Irrigation District; J. Albert Brown

Ranches, Inc.; Pioneer Irrigation Company; Show Low/Pinetop-Woodland Irrigation Company; Silver Creek Irrigation District; Lakeside Irrigation Company; Little Colorado Water Conservation District; Forest Lakes Domestic Water Improvement District; Pinetop-Lakeside Sanitary District; Porter Springs, LLC; and Atkinson Trading Company, Inc.

### **3.0 GENERAL PROVISIONS**

#### **3.1 DEFINITIONS**

For purposes of this Agreement only, the terms set forth below shall have the meanings ascribed to them in this Subparagraph.

3.1.1 “1934 Act Case” shall mean *Honyoama v. Shirley, Jr.*, Case No. CIV 74-842-PHX-EHC (D. Ariz. 2006).

3.1.2 “AFY” shall mean acre-feet per Year.

3.1.3 “Abstract” shall mean a summary of Water Rights or Uses held or owned by any Person, as represented in a form substantially similar to the one attached as Exhibit 3.1.3.

3.1.4 “Act” shall mean the Northeastern Arizona Indian Water Rights Settlement Act of 2024, a copy of which is attached hereto as Exhibit 3.1.4.

3.1.5 “Agreement” shall mean this Northeastern Arizona Indian Water Rights Settlement Agreement and the Exhibits attached hereto.

3.1.6 “Akchin” shall mean traditional water capture practices which include Low Technology Watershed Restoration and practices which are traditionally used to improve soil health and moisture levels, increase forage, improve habitat, prevent erosion and otherwise facilitate sediment retention, slow water flow, induce sediment deposition, increase water spreading over floodplain, induce meandering and mitigate erosive forces, increase base flow, or increase groundwater recharge.

3.1.7 “Arizona Department of Water Resources” or “ADWR” shall mean the agency of the State established pursuant to A.R.S. § 45-102, *et seq.*, or its successor agency or entity.

3.1.8 “Arizona State Land Department” or “ASLD” shall mean the agency of the State established pursuant to A.R.S. § 37-101, *et seq.*, or its successor agency or entity.

3.1.9 “ASLD Lands” shall mean land owned by the State acting through ASLD and held in trust pursuant to the Arizona-New Mexico Enabling Act of June 20, 1910, ch. 310, 36 Stat. 557, as amended. ASLD has charge and control of ASLD Land pursuant to A.R.S. § 37-101, *et seq.*

3.1.10 “Bar T Bar” shall mean, collectively, Bar T Bar Ranch, Inc., Bar T Bar Ranch Company, LLP, and Meteor Crater Enterprises, Inc.

3.1.11 “Betterment” shall mean any water control measures or practices to optimize Water Use, including project reconfiguration, as long as the Diversion capacity, surface storage capacity, or irrigated acreage is not increased.

3.1.12 “Buffer Zone 1” shall mean the lands generally within two sections of the western and southern boundary of the Navajo Reservation bounded on the east by the Arizona-New Mexico state line and extending west thence extending north, but excluding: (a) Twin Arrows; (b) Turquoise Ranch; (c) Public Domain Allotments outside the Navajo Reservation; (d) lands managed by the United States National Park Service; (e) lands managed by the United States Forest Service; (f) fee lands owned by the Zuni Tribe; (g) lands excluded from Buffer Zone 1 in Exhibit 9.10; and (h) all ASLD Land as of the Effective Date in Sections 6 and 12, T20N R11E, and Section 36, T21N R10E. Buffer Zone 1 is depicted on the map attached hereto as Exhibit 3.1.12. In the case of a conflict between this definition and Exhibit 3.1.12, this definition shall control. Notwithstanding Subparagraph 3.1.112, Navajo Reservation, as used in this Subparagraph 3.1.12, shall not include lands taken into trust as part of the Navajo Reservation subsequent to the Effective Date.

3.1.13 “Buffer Zone 2” shall mean the lands generally within six sections of the western and southern boundary of the Navajo Reservation, bounded on the east by the Arizona-New Mexico state line and extending west thence extending north, but excluding: (a) Twin Arrows; (b) Turquoise Ranch; (c) Public Domain Allotments outside the Navajo Reservation; (d) lands managed by the United States National Park Service; (e) lands managed by the United States Forest Service; (f) fee lands owned by the Zuni Tribe; (g) lands excluded from Buffer Zone 2 in Exhibit 9.10; and (h) all lands within Buffer Zone 1. All ASLD Land as of the Effective Date in Sections 6 and 12, T20N R11E, and Section 36, T21N R10E, shall be treated as though they are in Buffer Zone 2. Buffer Zone 2 is depicted on the

map attached hereto as Exhibit 13.1.12. In the case of a conflict between this definition and Exhibit 13.1.12, this definition shall control. Notwithstanding Subparagraph 3.1.112, Navajo Reservation, as used in this Subparagraph 3.1.13, shall not include lands taken into trust as part of the Navajo Reservation subsequent to the Effective Date.

3.1.14 “Buffer Zones” shall mean Buffer Zone 1 and Buffer Zone 2, collectively.

3.1.15 “CAP Repayment Contract” shall mean: (a) the contract dated December 1, 1988 (Contract No. 14-06-W-245, Amendment No. 1), between the United States and the Central Arizona Water Conservation District for the delivery of water and the repayment of costs of the Central Arizona Project; and (b) any amendment to, or revision of, that contract.

3.1.16 “CAP System” shall mean: (a) the Mark Wilmer Pumping Plant; (b) the Hayden-Rhodes Aqueduct; (c) the Fannin-McFarland Aqueduct; (d) the Tucson Aqueduct; (e) any pumping plant or appurtenant work of a feature described in (a), (b), (c), or (d); and (f) any extension of, addition to, or replacement for a feature described in (a), (b), (c), (d), or (e).

3.1.17 “Central Arizona Project” or “CAP” shall mean the federal reclamation project authorized and constructed by the United States in accordance with Title III of the Colorado River Basin Project Act (43 U.S.C. § 1521, *et seq.*).

3.1.18 “Central Arizona Water Conservation District” or “CAWCD” shall mean the political subdivision of the State that is the contractor under the CAP Repayment Contract.

3.1.19 “Cibola Water” shall mean the Hopi Tribe’s entitlement to the Diversion of up to 4,278 AFY of the Fourth Priority Water described in the Hopi Tribe Existing Cibola Contract.

3.1.20 “Claimant” shall mean a Person who has filed a Statement of Claimant in the LCR Adjudication.

3.1.21 “Closed Basin” shall mean those Surface Water subwatersheds within the LCR Watershed depicted on the maps attached as Exhibits 3.1.21A and 3.1.21B.

3.1.22 “Colorado River Compact” shall mean the Colorado River Compact of 1922, as ratified and reprinted at Title 45, Chapter 7, Article 2 of the Arizona Revised Statutes.

3.1.23 “Colorado River Water” shall mean the waters of the Colorado River authorized for use within the State by: the Boulder Canyon Project Act of 1928, 43 U.S.C. §§ 617c and 617d, as amended; the Upper Colorado River Basin Compact of 1948, as ratified and reprinted in Title 45, Chapter 7, Article 3 of the Arizona Revised Statutes; the Colorado River Basin Project Act of 1968, 43 U.S.C. § 1501, *et seq.*, as amended; the Contract for Delivery of Water Between the United States and the State of Arizona dated February 9, 1944; and the Decree. The definition of Colorado River Water in this Agreement and the Act shall not be used for any interpretation of: the Boulder Canyon Project Act of 1928, 43 U.S.C. §§ 617c and 617d, as amended; the Upper Colorado River Basin Compact of 1948, as ratified and reprinted in Title 45, Chapter 7, Article 3 of the Arizona Revised Statutes; the Colorado River Basin Project Act of 1968, 43 U.S.C. § 1501, *et seq.*, as

amended; the Contract for Delivery of Water Between the United States and the State of Arizona dated February 9, 1944; or the Decree.

3.1.24 “Confined Aquifer” shall mean any location at which the static water level in a Well completed in the N-Aquifer rises 10 feet or more above the top of the geologic formation known as the Navajo Sandstone at the time the Well is drilled, as generally depicted on Exhibit 3.1.24. In the case of a conflict between this definition and Exhibit 3.1.24, Exhibit 3.1.24 shall control.

3.1.25 “Decree”, when used without a modifying adjective, shall mean collectively the decree of the Supreme Court of the United States in *Arizona v. California*, 376 U.S. 340 (1964), the Consolidated Decree entered on March 27, 2006, in that case, 547 U.S. 150, and any modifications thereof.

3.1.26 “De Minimis Use” shall mean a Surface Water Use for: (a) domestic purposes not to exceed one AFY; (b) stockwatering purposes; (c) wildlife purposes; or (d) an Impoundment having a storage capacity of not more than fifteen acre-feet that is used primarily for watering livestock or wildlife.

3.1.27 “Deplete” shall mean an action or process that leads to a Depletion.

3.1.28 “Depletion” shall mean: (a) in the Lower Basin, Diversions less return flows; and (b) in the Upper Basin, the quantity of consumptive use measured by human-made decreases of the virgin flow at Lee Ferry.

3.1.29 “Director” shall mean the Director of the Arizona Department of Water Resources.

3.1.30 “Diversion” shall mean an act to Divert.

3.1.31 “Divert,” “Diverting,” and “Diverted” shall mean to receive, withdraw, develop, produce or capture Water using: (a) a ditch, canal, flume, bypass, pipeline, pit, collection or infiltration gallery, conduit, Well, pump, turnout, dam, or any other mechanical device; or (b) any other human act.

3.1.32 “Domestic Use” shall mean the Diversion of Water by one or more individuals or households for purposes of: (a) drinking, cooking, laundering, and other personal comforts or necessities; (b) the irrigation of a family garden, orchard, or yard less than two acres in size per family unit or household; (c) livestock watering using tanks with a storage capacity not to exceed 5,000 gallons; or (d) the crafting of articles such as jewelry, pottery, or other traditional items by a household resident for personal use or sale.

3.1.33 “Effective Date” shall mean the date as of which this Agreement has been executed by no less than 30 of the Parties including all of the following: the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, the State of Arizona, the Arizona State Land Department, the Central Arizona Water Conservation District, the Salt River Project Agricultural Improvement and Power District, and the Salt River Valley Water Users’ Association.

3.1.34 “Effluent” shall mean Water that: (a) has been used in the State for domestic, municipal, or industrial purposes, other than solely for hydropower generation; and (b) is available for re-use for any purpose, regardless of whether the Water has been treated to improve the quality of the Water.

3.1.35 “Enactment Date” shall mean the date as of which the legislation approving this Agreement has been enacted by Congress.

3.1.36 “Enforceability Date” shall mean the date on which the Secretary publishes in the Federal Register the statement of findings described in section 16 of the Act and Paragraph 14.0 of this Agreement.

3.1.37 “Exempt Well” shall mean a Well having a pump with a maximum capacity of not more than 35 GPM. For purposes of determining whether a Well is an Exempt Well, a series of Wells serving the same facility shall be considered a single Well.

3.1.38 “Exhibit” shall mean an exhibit to this Agreement as enumerated in Subparagraph 3.2.

3.1.39 “Existing Reservoir” shall mean: (a) before the final judgment and decree entered by the LCR Adjudication Court, a Reservoir existing on or before the Effective Date that is the subject of a Statement of Claimant; and (b) after the final judgment and decree entered by the LCR Adjudication Court, any Reservoir included in that decree with a priority date earlier than the Effective Date.

3.1.40 “Existing Surface Water Use” shall mean: (a) before the final judgment and decree entered by the LCR Adjudication Court, any Use of Surface Water initiated on or before the Effective Date that is the subject of a Statement of Claimant; and (b) after the final judgment and decree entered by the LCR Adjudication Court, any Use of Surface Water included in that decree with a priority date earlier than the Effective Date.

3.1.41 “Existing Well” shall mean a Non-Exempt Well that was completed or substantially completed on or before the Effective Date for the purpose of withdrawing Underground Water, and that has not been abandoned by filling or sealing the Well so as to prevent the Well, including the annular space outside the casing, from being a channel allowing the vertical movement of Underground Water.

3.1.42 “Fifth Priority Water” shall mean Fifth Priority Water as that term is defined in the Hopi Tribe Existing Cibola Contract.

3.1.43 “Fourth Priority Water” shall mean Colorado River Water available for delivery within the State for satisfaction of entitlements: (a) in accordance with contracts, Secretarial reservations, perfected rights, and other arrangements between the United States and water users in the State entered into or established subsequent to September 30, 1968, for use on federal, State, or privately owned lands in the State, in a total quantity not greater than 164,652 AFY of Diversions; and (b) after first providing for the delivery of Colorado River Water for the CAP System, including for use on Indian land, under Section 304(e) of the Colorado River Basin Project Act (43 U.S.C. § 1524(e)), in accordance with the CAP Repayment Contract.

3.1.44 “GPM” shall mean gallons per minute.

3.1.45 “Gila River Adjudication” shall mean that action pending in the Superior Court of the State, in and for the County of Maricopa, In re the General Adjudication of All Rights To Use Water in The Gila River System and Source, W-1 (Salt), W-2 (Verde), W-3 (Upper Gila), W-4 (San Pedro) (Consolidated).

3.1.46 “Gila River Adjudication Court” shall mean the Superior Court of the State, in and for the County of Maricopa, exercising jurisdiction over the Gila River Adjudication.

3.1.47 “Gila River Adjudication Decree” shall mean the judgment or decree entered by the Gila River Adjudication Court in substantially the same form as the form of judgment attached hereto as Exhibit 3.1.47.

3.1.48 “Groundwater” shall mean all water beneath the surface of the earth within the State that is not: (a) Surface Water; (b) Colorado River Water; or (c) Effluent.

3.1.49 “Historic Irrigation Diversion Capacity” shall mean Water Diverted from the Managed Washes that is determined from historical records or evidence.

3.1.50 “Hopi Allotment” shall mean any of the eleven (11) parcels allotted pursuant to Section 4 of the General Allotment Act of 1887, 24 Stat. 389, ch. 119 (formerly codified at 25 U.S.C. § 334) that are: (a) located within the exterior boundaries of the Hopi Reservation; and (b) held in trust by the United States for the benefit of one or more individual Indians under allotment record numbers AR-39, -40, -41, -42, -43, -44, -45, -46, -47, -48, and -49.

3.1.51 “Hopi Allottee” shall mean an individual Indian holding a beneficial interest in a Hopi Allotment, or an Indian Tribe holding an undivided fractional beneficial interest in a Hopi Allotment.

3.1.52 [Intentionally Omitted]

3.1.53 “Hopi Fee Land” shall mean land, other than Hopi Trust Land, that: (a) is located in the State outside the exterior boundaries of the Hopi Reservation; and (b) as of the Enforceability Date, is owned by the Hopi Tribe, whether in its own name or through an entity wholly owned or controlled by the Hopi Tribe.

3.1.54 “Hopi Industrial Park” shall mean those lands held in trust by the United States for the Hopi Tribe as provided in the Act of May 22, 1970, Pub. L. No. 91-264, § 1, 84 Stat. 260 (1970).

3.1.55 “Hopi Land” shall mean, collectively, the Hopi Reservation, Hopi Trust Land, and Hopi Fee Land.

3.1.56 “Hopi Reservation” shall mean those lands within the exterior boundaries of the “Hopi Indian Reservation” defined as District 6, and all lands withdrawn by the Executive Order of Dec. 16, 1882 and partitioned to the Hopi Tribe in accordance with the Act of Dec. 22, 1974, Pub. L. 93-531, § 4, 88 Stat. 1713 (formerly codified as amended at 25 U.S.C. § 640d-3), by Judgment of Partition, Feb. 10, 1977, *Sekaquaptewa v. MacDonald*, Case No. CIV-579-PCT-JAW (D. Ariz.), *aff’d*, 626 F.2d 113 (9th Cir. 1980), and all lands recognized as part of the Hopi Reservation in the 1934 Act Case. The foregoing definition is

more particularly set forth on the map attached as Exhibit 3.1.56. In case of a conflict between this definition and Exhibit 3.1.56, Exhibit 3.1.56 shall be demonstrative only, and this definition shall control.

3.1.57 “Hopi Tribe” shall mean the Hopi Tribe, a tribe of Hopi Indians organized under Section 16 of the Indian Reorganization Act of June 18, 1934, 48 Stat. 987 (25 U.S.C. § 476), and duly recognized by the Secretary (89 Fed. Reg. 944, 945 (Jan. 8, 2024)).

3.1.58 “Hopi Tribe Agricultural Conservation Trust Fund Account” shall mean the account created pursuant to section 11 of the Act and described in Subparagraph 12.3.3.

3.1.59 “Hopi Tribe Cibola Water” shall mean the Fourth, Fifth, and Sixth Priority Colorado River Water to which the Hopi Tribe is entitled pursuant to Subparagraphs 5.8.2 and 5.8.3.

3.1.60 “Hopi Tribe Existing Cibola Contract” shall mean Contract No. 04-XX-30-W0432 between the United States and the Hopi Tribe, as amended and in full force and effect as of the Effective Date.

3.1.61 “Hopi Tribe Groundwater Projects” shall mean the projects described in Subparagraph 12.3.1.

3.1.62 “Hopi Tribe Groundwater Projects Trust Fund Account” shall mean the account created pursuant to section 11 of the Act and described in Subparagraph 12.3.1.

3.1.63 “Hopi Tribe Lower Basin Colorado River Water Acquisition Trust Fund Account” shall mean the account created pursuant to section 11 of the Act and described in Subparagraph 12.3.4.

3.1.64 “Hopi Tribe OM&R Trust Fund Account” shall mean the account created pursuant to section 11 of the Act and described in Subparagraph 12.3.2.

3.1.65 “Hopi Tribe Settlement Cibola Contract” shall mean the contract entered into between the United States and the Hopi Tribe pursuant to this Agreement and the Act for delivery of Hopi Tribe Cibola Water after the Enforceability Date.

3.1.66 “Hopi Tribe Upper Basin Colorado River Water” shall mean the 2,300 AFY of Upper Basin Colorado River Water allocated to the Hopi Tribe as provided in Subparagraphs 5.7 and 11.1.1 and pursuant to section 6 of the Act.

3.1.67 “Hopi Tribe Water Delivery Contract” shall mean one or more contracts entered into by the Secretary and the Hopi Tribe in accordance with this Agreement and the Act for the delivery of Hopi Tribe Upper Basin Colorado River Water or Hopi Tribe Cibola Water.

3.1.68 “Hopi Trust Land” shall mean land that: (a) is located in the State outside the exterior boundaries of the Hopi Reservation; and (b) as of the Enforceability Date, is held in trust by the United States for the benefit of the Hopi Tribe.

3.1.69 “iiná bá - paa tuwaqat’si pipeline” shall mean the Water project described in Subparagraph 12.1 and section 8 of the Act.

3.1.70 “iiná bá – paa tuwaqat’si pipeline Implementation Fund Account” shall mean the account created in the Treasury of the United States pursuant to section 9 of the Act and described in Subparagraph 12.1.1.

3.1.71 “Impoundment” shall mean a human-made structure used to store Water.

3.1.72 “Industrial Use” shall mean the use of Water by any Person engaged in generating electrical energy, or making, converting, or extracting objects or materials into commercially valuable products by machinery or any other mechanical process, including the extraction, conversion, or transportation of any materials.

3.1.73 “Injury to Rights to Surface Water” shall mean, for purposes of Paragraph 8.0 only, a direct Diversion of Surface Water, other than from a Well, that materially diminishes the flows and flood flows of Surface Water on the Navajo Reservation or on a Navajo Allotment.

3.1.74 “Injury to Water Rights” shall mean an interference with, diminution of, or deprivation of Water Rights under federal, State, or other law. The term “Injury to Water Rights” does not include any injury to water quality.

3.1.75 “Injury to Water” shall mean injury to Water based on changes in or degradation of the salinity or concentration of naturally occurring chemical constituents contained in Water.

3.1.76 “Irrigation” shall mean the Use of Water on two (2) or more acres of land to produce plants or parts of plants for sale or human consumption, or for use as feed for livestock, range livestock, or poultry.

3.1.77 “Kerley Valley Project” shall mean an irrigation project that is south and southwest of Tuba City that serves both Navajo and Hopi farmers (as described in the November 28, 2000, Kerley Valley and Lower Kerley Valley report).

3.1.78 “Lake Mary Reservoirs” shall mean those Reservoirs described in the City of Flagstaff’s Abstracts set forth in Exhibit 8.2.1.1D.

3.1.79 “LCR” shall mean the Little Colorado River.

3.1.80 “LCR Adjudication” shall mean that action pending in the Superior Court of the State, in and for the County of Apache, In re: the General Adjudication of All Rights to Use Water in the Little Colorado River System and Source, CIV No. 6417.

3.1.81 “LCR Adjudication Court” shall mean the Superior Court of the State, in and for the County of Apache, exercising jurisdiction over the LCR Adjudication.

3.1.82 “LCR Decree” shall mean the judgment or decree entered by the LCR Adjudication Court in substantially the same form as the form of judgment attached hereto as Exhibit 3.1.82.

3.1.83 “LCR Watershed” shall mean lands located within the Surface Water drainage of the LCR and its tributaries in the State, as shown on the map attached as Exhibit 3.1.83.

3.1.84 “Little Colorado River Plateau Groundwater Basin” shall mean the ‘Little Colorado river plateau groundwater basin’ as that term is used in A.R.S. § 45-544.

3.1.85 “Low Technology Watershed Restoration” shall mean installation, construction, maintenance, repair, replacement, and relocation of low technology structures (for example, one-rock dams, wicker weirs, rock or picket baffles, post vanes, check dams, gully plugs, bagged earth, straw bales or baffles, media lunas, Zuni bowls, berms, and trincheras) in the Managed Washes and Minor Tributary Washes for Watershed Restoration purposes.

3.1.86 “Lower Basin” shall mean the ‘Lower Basin’ as defined in Article II(g) of the Colorado River Compact.

3.1.87 “Lower LCR Watershed” shall mean that portion of the LCR Watershed that is depicted as the “Lower LCR Watershed” on the map attached hereto as Exhibit 3.1.83, excluding the Navajo Reservation and the Hopi Reservation. Notwithstanding Subparagraph 3.1.112, Navajo Reservation, as used in this Subparagraph 3.1.87 shall not include lands taken into trust as part of the Navajo Reservation subsequent to the Effective Date.

3.1.88 “Main Washes” shall mean the mainstem of the five washes north of, and tributary to, the Little Colorado River, which flow across both the Navajo Reservation and the Hopi Reservation: Moenkopi, Dinnebito, Oraibi, Polacca, and Jeddito (also known as Jadito per the United States Geological Survey).

3.1.89 “Major Tributary Washes” shall mean the mainstem of Shonto, Begashibito, and Wepo washes, which are tributary to the Main Washes.

3.1.90 “Managed Washes” shall mean the mainstems of the Main Washes and the Major Tributary Washes. These Managed Washes are shown on the map attached hereto as Exhibit 7.1.1.2D.

3.1.91 “McHood Reservoir”, also known as “Clear Creek Reservoir”, shall mean that Reservoir located on Clear Creek owned by the City of Winslow, as described in the City of Winslow’s Abstract set forth in Exhibit 8.2.1.1J.

3.1.92 “Member” or “Members” shall mean any person or persons duly enrolled as a member or members of the Navajo Nation, the Hopi Tribe, or the San Juan Southern Paiute Tribe.

3.1.93 “Minor Tributary Washes” shall mean all washes tributary to the Managed Washes, other than the Major Tributary Washes.

3.1.94 “Municipal Use” shall mean all non-Irrigation Uses of Water supplied by a Municipal Water Provider.

3.1.95 “Municipal Water Provider” shall mean a city, town, private water company, specially designated homeowners association, any special taxing district established pursuant to Title 48 of the Arizona Revised Statutes, or a Tribe or any of its entities or enterprises, that supplies Water for Municipal Use.

3.1.96 “N-Aquifer” shall mean the Navajo Aquifer depicted on Exhibit 3.1.96.

3.1.97 “Navajo Allotment” shall mean a parcel of land patented pursuant to Section 1 of the General Allotment Act of 1887, 24 Stat. 388, ch. 119 (formerly codified at 25 U.S.C. § 331): (a) originally allotted to an individual identified in the allotting document as a Navajo Indian; (b) located within the exterior boundaries of the Navajo Reservation; and (c) held in trust by the United States for the benefit of one or more individual Indians.

3.1.98 “Navajo Allottee” shall mean an individual Indian holding a beneficial interest in a Navajo Allotment, or an Indian Tribe holding an undivided fractional beneficial interest in a Navajo Allotment.

3.1.99 “Navajo Fee Land” shall mean land, other than Navajo Trust Land, that: (a) is located in the State; (b) is located outside the exterior boundaries of the Navajo Reservation; and (c) as of the Enforceability Date, is owned by the Navajo Nation, whether in its own name or through an entity wholly owned or controlled by the Navajo Nation.

3.1.100 “Navajo Land” shall mean, collectively, the Navajo Reservation, Navajo Trust Land, and Navajo Fee Land.

3.1.101 “Navajo Nation” shall mean the Navajo Nation, a body politic and federally recognized Indian nation, 89 Fed. Reg.944, 945 (Jan. 8, 2024), also known variously as the ‘Navajo Tribe’, the ‘Navajo Tribe of Arizona, New Mexico & Utah’, the ‘Navajo Tribe of Indians’, and other similar names, and includes all bands of Navajo Indians and chapters of the Navajo Nation.

3.1.102 “Navajo Nation Agricultural Conservation Trust Fund Account” shall mean the account created pursuant to section 10 of the Act and described in Subparagraph 12.2.4.

3.1.103 “Navajo Nation Cibola Water” shall mean the Navajo Nation’s entitlement to the diversion of up to 100 AFY of Fourth Priority Water at the same location and for the same Uses described in the Hopi Tribe Existing Cibola Contract or the delivery and consumptive use of up to 71.5 AFY at locations and for uses within the State other than as described in the Existing Hopi Tribe Cibola Contract, which shall have been assigned and transferred by the Hopi Tribe from its Cibola Water under the Hopi Tribe Existing Cibola Contract to the Navajo Nation.

3.1.104 “Navajo Nation Fourth Priority Water” shall mean the Diversion right to 3,500 AFY of Fourth Priority Water reserved for use in a Navajo-Hopi Indian water rights settlement under Paragraph 11.3 of the Arizona Water Settlement Agreement among the United States, the State of Arizona, and the Central Arizona Water Conservation District, as authorized by Section 106(a)(1) and (2) of Public Law 108-451, and allocated to the Navajo Nation as provided in Subparagraphs 4.9 and 10.1 and pursuant to section 6 of the Act.

3.1.105 “Navajo Nation Lower Basin Colorado River Water Acquisition Trust Fund Account” shall mean the account created pursuant to section 10 of the Act and described in Subparagraph 12.2.5.

3.1.106 “Navajo Nation OM&R Trust Fund Account” shall mean the account created pursuant to section 10 of the Act and described in Subparagraph 12.2.2.

3.1.107 “Navajo Nation Renewable Energy Trust Fund Account” shall mean the account created pursuant to section 10 of the Act and described in Subparagraph 12.2.3.

3.1.108 “Navajo Nation Upper Basin Colorado River Water” shall mean the 44,700 AFY of Upper Basin Colorado River Water allocated to the Navajo Nation as provided in Subparagraphs 4.7 and 10.1 and pursuant to section 6 of the Act.

3.1.109 “Navajo Nation Water Delivery Contract” shall mean one or more contracts entered into by the Secretary and the Navajo Nation in accordance with this Agreement and the Act for the delivery of Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, or Navajo Nation Fourth Priority Water.

3.1.110 “Navajo Nation Water Projects” shall mean the projects described in Subparagraph 12.2.1.

3.1.111 “Navajo Nation Water Projects Trust Fund Account” shall mean the account created pursuant to section 10 of the Act and described in Subparagraph 12.2.1.

3.1.112 “Navajo Reservation” shall mean those lands shown on the map attached hereto as Exhibit 3.1.112a, which are: within the exterior boundaries of the “Navajo Indian

Reservation” in the State, defined by the Act of June 14, 1934, ch. 521, 48 Stat. 960; all lands withdrawn by the Executive Order of Dec. 16, 1882 and partitioned to the Navajo Nation in accordance with the Act of Dec. 22, 1974, Pub. L. 93-531, § 8(b), 88 Stat. 1713 (previously codified as amended at 25 U.S.C. § 640d-7(b)), by Judgment of Partition, Feb. 10, 1977, *Sekaquaptewa v. MacDonald*, Case No. CIV-579-PCT-JAW (D. Ariz.), *aff’d*, 626 F.2d 113 (9th Cir. 1980); all lands taken into trust as a part of the Navajo Reservation pursuant to the Act of Dec. 22, 1974, Pub. L. No. 93-531, § 11, 88 Stat. 1713, as amended (previously codified at 25 U.S.C. § 640d-10, a copy of which is attached as Exhibit 3.1.112b); and excepting all lands within the Hopi Reservation as defined in Subparagraph 3.1.56 and the San Juan Southern Paiute Reservation as defined in Subparagraph 3.1.148; provided, however, that if lands are taken in to trust as part of the Navajo Reservation pursuant to the Act of December 22, 1974, subsequent to the Effective Date, such lands shall be considered part of the Navajo Reservation as if they had been reservation lands prior to the Effective Date, except as provided in Subparagraphs 3.1.12, 3.1.13, 3.1.87, 3.1.170, 4.1.5, 4.1.6, 4.6.1, and 8.1.1. In the case of a conflict between this definition and Exhibit 3.1.112a, Exhibit 3.1.112a shall be demonstrative only, and this definition shall control.

3.1.113 “Navajo Tribal Utility Authority” or “NTUA” shall mean the enterprise established by the Navajo Nation found at 21 N.N.C. § 1 *et seq.*, or its successor agency or entity.

3.1.114 “Navajo Trust Land” shall mean land that: (a) is located in the State; (b) is located outside the exterior boundaries of the Navajo Reservation; and (c) as of the Enforceability Date, is held in trust by the United States for the benefit of the Navajo Nation.

3.1.115 “New Reservoir” means a Reservoir that is constructed after the Effective Date, including any additional storage capacity constructed in a Reservoir after the Effective Date. A “New Reservoir” shall not include a Reservoir that is modified, reconstructed, or replaced after the Effective Date as provided in Subparagraphs 8.6.4, 8.8.2, and 8.8.3, or an Impoundment that is modified or enlarged as provided in Subparagraph 8.6.5.

3.1.116 “New Surface Water Use” shall mean a Use of Surface Water initiated after the Effective Date.

3.1.117 “New Well” shall mean a Non-Exempt Well that is completed after the Effective Date for the purpose of withdrawing Underground Water, excluding a replacement Well drilled pursuant to Subparagraph 9.4.2.

3.1.118 “Non-Exempt Well” shall mean a Well with a maximum capacity greater than 35 GPM.

3.1.119 “Norviel Decree” shall mean the final decree of the Superior Court of the State, in and for the County of Apache, in *The St. John's Irrigation Company and the Meadows Reservoir Irrigation Company, et al. v. Round Valley Water Storage & Ditch*

Company, Eagar Irrigation Company, Springerville Water Right and Ditch Company, et al., Case No. 569 (Apr. 29, 1918), and any modifications thereof.

3.1.120 “Off-Reservation” shall mean lands located in the State outside the exterior boundaries of the Navajo Reservation, the Hopi Reservation, and the San Juan Southern Paiute Reservation.

3.1.121 “OM&R” shall mean operation, maintenance, and replacement.

3.1.122 “Paragraph” shall mean a numbered paragraph of this Agreement, including all Subparagraphs in such Paragraph.

3.1.123 “Party” or “Parties” shall mean a Person who is a signatory or Persons who are signatories to this Agreement.

3.1.124 "Pasture Canyon" shall mean the incised wash tributary to Moenkopi wash that extends approximately 4.5 miles in length. Approximately 3.0 miles of the canyon, beginning from Highway 160 (NW ¼ SW ¼ Section 27 T32N R11E) and moving north, are located within the external boundaries of the Hopi Reservation. The north most 1.5-mile section of the canyon (ending in the NE ¼ Section 3 T32N R11E) is located on the Navajo Reservation. Pasture Canyon, including the portion located within the external boundaries of the Hopi Reservation, and the portion located on the Navajo Reservation, is labeled and generally identified on Exhibit 7.2.3.5.4.

3.1.125 “Peabody Impoundments” shall mean the Impoundments described and depicted in Exhibit 3.1.125.

3.1.126 “Permanent Surface Water Control Structure” shall mean any water control structure: (a) over fifteen feet in height, as measured from the lowest elevation of the downstream toe at its intersection with the natural ground surface to either the spillway crest, or the crest of dam if a spillway is not present; or (b) with active storage of more than seventy-five acre-feet.

3.1.127 “Person” shall mean: an individual; public or private corporation; company; partnership; joint venture; firm; association; society; estate or trust; any other private organization or enterprise; the United States; any Indian tribe; any state, territory, or country; any governmental entity; and any political subdivision or municipal corporation organized under or subject to the constitution and laws of the State. This definition includes the officers, directors, agents, insurers, representatives, employees, attorneys, assigns, subsidiaries, affiliates, enterprises, legal representatives, assigns, predecessors, and successors in interest and their heirs, of any Person.

3.1.128 “Points of Access” shall mean one or more locations where the City of Flagstaff provides access to Water delivered from the Red Gap Ranch Regional Pipeline Project.

3.1.129 “Prior Written Consent” shall mean ‘Prior Written Consent’ as provided in Subparagraph 7.5.1.

3.1.130 “Public Domain Allottee” shall mean an individual Indian or an Indian tribe holding a beneficial interest in a Public Domain Allotment outside the Navajo Reservation or a Public Domain Allotment within the Navajo Reservation.

3.1.131 “Public Domain Allotments within the Navajo Reservation” shall mean lands allotted to individual Indians from the public domain that are (1) held in trust by the United States for the benefit of one or more individual Indians or Indian tribes and (2) located within the exterior boundaries of the Navajo Reservation. A list of Public Domain Allotments within the Navajo Reservation is attached hereto as Exhibit 3.1.131.

3.1.132 “Public Domain Allotments outside the Navajo Reservation” shall mean the 51 parcels of land allotted to individual Indians from the public domain pursuant to Section 4 of the General Allotment Act of 1887, 24 Stat. 388, ch. 119 that are (1) held in trust by the United States for the benefit of one or more individual Indians or Indian tribes and (2) located outside the exterior boundaries of the Navajo Reservation and the Hopi Reservation, as depicted on the map attached hereto as Exhibit 3.1.132A. Abstracts for the 51 Public Domain Allotments outside the Navajo Reservation are attached hereto as Exhibit 3.1.132B.

3.1.133 “Reclamation” shall mean the United States Bureau of Reclamation.

3.1.134 “Red Gap Ranch” shall mean those fee lands owned by the City of Flagstaff, located approximately 35 miles east of the City of Flagstaff along Interstate 40, as depicted in Exhibit 3.1.134A, and more particularly described in Exhibit 3.1.134B. In

case of a conflict between the map in Exhibit 3.1.134A and the legal description in Exhibit 3.1.134B, the legal description in Exhibit 3.1.134B shall control.

3.1.135 “Red Gap Ranch Regional Pipeline Project” shall mean the City-owned and operated infrastructure, pumping and storage facilities, treatment facilities, and Points of Access necessary for the City of Flagstaff to withdraw and deliver Water from Red Gap Ranch or from locations south of Red Gap Ranch to the City of Flagstaff and Points of Access for Municipal Use.

3.1.136 “Rehabilitation” shall mean the replacement in kind with comparable works, including on-farm or system water conservation measures and technologically improved components, so long as the Diversion capacity, surface storage capacity, or irrigated acreage is not increased.

3.1.137 “Reservoir” shall mean an Impoundment of Surface Water that is not a De Minimis Use.

3.1.138 “Restricted Zone” shall mean lands depicted on the map attached hereto as Exhibit 3.1.138 within one-half mile of either side of the boundary line between the Hopi Reservation and the Navajo Reservation. In the case of conflict between this definition and Exhibit 3.1.138, Exhibit 3.1.138 shall control.

3.1.139 “San Juan Southern Paiute Fee Land” shall mean land, other than San Juan Southern Paiute Trust Land, that: (a) is located in the State; (b) is located outside the exterior boundaries of the San Juan Southern Paiute Reservation; and (c) as of the

Enforceability Date, is owned by the San Juan Southern Paiute Tribe, whether in its own name or through an entity wholly owned or controlled by the San Juan Southern Paiute Tribe.

3.1.140 “San Juan Southern Paiute Groundwater Projects” shall mean the projects described in Subparagraph 12.4.1 and section 12 of the Act.

3.1.141 “San Juan Southern Paiute Land” shall collectively mean the San Juan Southern Paiute Southern Area, San Juan Southern Paiute Trust Land, and San Juan Southern Paiute Fee Land.

3.1.142 “San Juan Southern Paiute Tribe Agricultural Conservation Trust Fund Account” shall mean the account created pursuant to section 12 of the Act and described in Subparagraph 12.4.3.

3.1.143 “San Juan Southern Paiute Tribe Groundwater Project Trust Fund Account” shall mean the account created pursuant to section 12 of the Act and described in Subparagraph 12.4.1.

3.1.144 “San Juan Southern Paiute Tribe OM&R Trust Fund Account” shall mean the account created pursuant to section 12 of the Act and described in Subparagraph 12.4.2.

3.1.145 “San Juan Southern Paiute Trust Land” shall mean land that: (a) is located in the State; (b) is located outside the exterior boundaries of the San Juan Southern Paiute Reservation; and (c) as of the Enforceability Date, is held in trust by the United States for the benefit of the San Juan Southern Paiute Tribe.

3.1.146 “San Juan Southern Paiute Northern Area” shall mean the land depicted on the map attached hereto as Exhibit 3.1.146.

3.1.147 “San Juan Southern Paiute Southern Area” shall mean the land depicted on the map attached hereto as Exhibit 3.1.147.

3.1.148 “San Juan Southern Paiute Reservation” shall mean the approximately 5,400 acres of land described in Paragraph 6.0 as the San Juan Southern Paiute Northern Area and the San Juan Southern Paiute Southern Area, as depicted in the maps attached hereto as Exhibit 3.1.146 and Exhibit 3.1.147.

3.1.149 “San Juan Southern Paiute Tribe” shall mean the San Juan Southern Paiute Tribe, a body politic and federally recognized Indian tribe, 89 Fed. Reg. 944, 946 (Jan. 8, 2024).

3.1.150 “Secretary” shall mean the Secretary of the United States Department of the Interior or the Secretary’s authorized designee.

3.1.151 “Sixth Priority Water” shall mean Sixth Priority Water as that term is defined in the Hopi Tribe Existing Cibola Contract.

3.1.152 “State” shall mean the State of Arizona.

3.1.153 “Statement of Claimant” shall mean a statement of claimant filed in the LCR Adjudication and bearing a file number beginning with the number ‘39’.

3.1.154 “Subparagraph” shall mean a numbered subparagraph of this Agreement.

3.1.155 “Surface Water” shall mean all water in the State that is appropriable under State law. “Surface Water” shall not include Colorado River Water.

3.1.156 “Three Canyon Area” shall mean the Clear Creek, Chevelon Creek, and Jacks Canyon subwatersheds of the LCR Watershed, as depicted on the map attached hereto as Exhibit 3.1.156. In the case of a conflict between this definition and Exhibit 3.1.156, Exhibit 3.1.156 shall control.

3.1.157 “Treaty” shall mean the Articles of Treaty and Agreement entered into by the Navajo Nation and the San Juan Southern Paiute Tribe to settle land claims and other disputes, as executed on March 18, 2000.

3.1.158 “Treaty Addendum” shall mean the Addendum to the Treaty entered into by the Navajo Nation and the San Juan Southern Paiute Tribe on May 7, 2004.

3.1.159 “Tribe” shall mean the Navajo Nation, the Hopi Tribe, or the San Juan Southern Paiute Tribe.

3.1.160 “Tribes” shall mean the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe.

3.1.161 “Turquoise Ranch” shall mean the 373.73 acres of land in Coconino County as described in Exhibit 3.1.161.

3.1.162 “Twin Arrows” shall mean the 405.61 acres of land in Coconino County as described in Exhibit 3.1.162.

3.1.163 “Underground Water” shall mean all water beneath the surface of the Earth, within the State, other than Effluent and Colorado River Water, regardless of its legal characterization as appropriable or non-appropriable under federal, State, or other law.

3.1.164 “United States” or “United States of America” shall mean the United States acting as trustee for the Tribes, their Members, Hopi Allottees, and Navajo Allottees, except as otherwise expressly provided. When the term ‘United States’ or ‘United States of America’ is used in reference to a particular agreement or contract, the term shall mean the United States acting in the capacity as set forth in such agreement or contract.

3.1.165 “Upper Basin” shall mean ‘Upper Basin’ as defined in Article II(f) of the Colorado River Compact.

3.1.166 “Upper Basin Colorado River Water” shall mean the 50,000 AFY of consumptive use of Colorado River Water apportioned to the State in the Upper Colorado River Basin Compact of 1948, as ratified and reprinted in Title 45, Chapter 7, Article 3 of the Arizona Revised Statutes.

3.1.167 “Use” shall mean any beneficial use, including instream flow, recharge, storage, recovery, or any other use recognized as beneficial under applicable law.

3.1.168 “Water”, when used without a modifying adjective, shall mean Groundwater, Surface Water, Colorado River Water, or Effluent.

3.1.169 “Water Right” shall mean any right in or to Groundwater, Surface Water, Colorado River Water, or Effluent under federal, State or other law.

3.1.170 “Watershed of the LCR” shall mean the Silver Creek watershed, the upper Little Colorado River watershed or the Lower LCR Watershed, as depicted on the map in Exhibit 3.1.83, but excluding the Navajo Reservation and the Hopi Reservation.

Notwithstanding Subparagraph 3.1.112, Navajo Reservation, as used in this Subparagraph 3.1.170, shall not include lands taken into trust as part of the Navajo Reservation subsequent to the Effective Date.

3.1.171 “Water Supply Contract” shall mean any agreement for Water service required by the City of Flagstaff that will address and include the operation, maintenance, energy, replacement, treatment, and capital expenses for the Red Gap Ranch Regional Pipeline Project, and other agreements regarding scheduling, capacity, reciprocal service, Water treatment, conveyance, temporary or permanent shortages, and other components for Water delivery.

3.1.172 “Watershed Restoration” shall mean efforts to: (a) support Akchin and flood-water farming; (b) improve soil health and moisture levels; (c) increase forage; (d) improve habitat; (e) prevent erosion and otherwise facilitate sediment retention; (f) slow Water flow; (g) induce sediment deposition; (h) increase Water spreading over floodplain; (i) induce meandering and mitigate erosive forces; (j) increase base flow; or (k) increase Underground Water recharge.

3.1.173 “Well” shall mean a human-made opening in the Earth through which Underground Water may be withdrawn or obtained.

3.1.174 “Year” shall mean a calendar year.

3.1.175 “Zuni Indian Tribe” or “Zuni Tribe” shall mean the body politic and federally recognized Indian tribe of that name, 89 Fed. Reg. 944, 947 (Jan. 8, 2024).

### 3.2 EXHIBITS

<b>Exhibit #</b>	<b>Description</b>
<b>3.1.3</b>	Form of Abstract
<b>3.1.4</b>	The legislation or the “Act”
<b>3.1.12</b>	Map of Buffer Zone 1 and Buffer Zone 2
<b>3.1.21A</b>	Map of Closed Basins Off-Reservation
<b>3.1.21B</b>	Map of Closed Basins On-Reservation
<b>3.1.24</b>	Map of N-Aquifer showing the Confined portion and the Shonto recharge zone
<b>3.1.47</b>	Form of Gila River Judgment and Decree
<b>3.1.56</b>	Map of Hopi Reservation
<b>3.1.82</b>	Form of LCR Judgment and Decree
<b>3.1.83</b>	Map of LCR Watershed
<b>3.1.96</b>	Map of N-Aquifer
<b>3.1.112a</b>	Map of Navajo Nation Reservation
<b>3.1.112b</b>	The Act of Dec. 22, 1974, Pub. Law 93-531
<b>3.1.125</b>	Map of Peabody Impoundments
<b>3.1.131</b>	List of Public Domain Allotments within the Navajo Reservation
<b>3.1.132a</b>	Map of 51 Public Domain Allotments outside the Navajo Reservation
<b>3.1.132b</b>	Abstracts of 51 Public Domain Allotments outside the Navajo Reservation
<b>3.1.134a</b>	Map of Red Gap Ranch fee lands owned by City of Flagstaff
<b>3.1.134b</b>	Legal Description of Red Gap Ranch fee lands owned by City of Flagstaff
<b>3.1.138</b>	Map of N-Aquifer Restricted Buffer Zone
<b>3.1.146</b>	Map of San Juan Southern Paiute Northern Area
<b>3.1.147</b>	Map of San Juan Southern Paiute Southern Area
<b>3.1.156</b>	Map of Three Canyon Area
<b>3.1.161</b>	Turquoise Ranch Legal Description
<b>3.1.162</b>	Twin Arrows Legal Description
<b>4.6.2</b>	LCR Mainstem Historic Irrigation Projects
<b>4.11.1A</b>	Map of Navajo Nation land in fee located outside the exterior boundaries of the Navajo Reservation within the LCR Watershed
<b>4.11.1B</b>	Abstracts of Navajo Nation Off-Reservation fee lands (Surface Water)

<b>Exhibit #</b>	<b>Description</b>
<b>4.11.1C</b>	Abstracts of Navajo Nation Off-Reservation fee lands (Underground Water)
<b>4.14.1A</b>	Map of Navajo Nation Off-Reservation land within the Gila River watershed
<b>4.14.1B</b>	Abstract of land within the Gila River watershed for Navajo Nation Off-Reservation Surface Water
<b>4.14.1C</b>	Abstract of land within the Gila River watershed for Navajo Nation Off-Reservation Underground Water
<b>5.9</b>	Abstracts of Hopi Allotments
<b>5.10.1A</b>	Map of 26 Bar Ranch
<b>5.10.1B</b>	Map of DoBell Ranch
<b>5.10.1C</b>	Map of Aja Ranch fee lands
<b>5.10.1D</b>	Map of Homolovi fee lands
<b>5.10.1E</b>	Hart Ranch fee lands
<b>5.10.1F</b>	Map of Clear Creek Ranch fee lands
<b>5.10.1G</b>	Map of Hart Ranch
<b>5.10.1H</b>	Map of Twin Arrows trust land
<b>5.10.1I</b>	Map of Drye Ranch
<b>5.10.1J</b>	Map of Aja Ranch trust lands
<b>5.10.1K</b>	Map of Clear Creek Ranch trust lands
<b>5.10.1L</b>	Map of Hopi Industrial Park
<b>5.10.1AA</b>	Hopi Abstracts for 26 Bar Ranch
<b>5.10.1BB</b>	Hopi Abstracts for DoBell Ranch
<b>5.10.1CC</b>	Hopi Abstracts for Aja Ranch fee lands
<b>5.10.1DD</b>	Hopi Abstracts for Homolovi fee lands
<b>5.10.1EE</b>	Hopi Abstracts for Hart Ranch fee lands
<b>5.10.1FF</b>	Hopi Abstracts for Clear Creek Ranch fee lands
<b>5.10.1GG</b>	Hopi Abstracts for Hart Ranch
<b>5.10.1HH</b>	Hopi Abstracts for Twin Arrows trust land
<b>5.10.1II</b>	Hopi Abstracts for Drye Ranch
<b>5.10.1JJ</b>	Hopi Abstracts for Aja Ranch trust lands
<b>5.10.1KK</b>	Hopi Abstracts for Clear Creek Ranch trust lands
<b>5.10.1LL</b>	Hopi Abstracts for Hopi Industrial Park
<b>6.4.1A</b>	Map of SJSP Tuba City Fee Lands
<b>6.4.1B</b>	Map of SJSP Belmont Parcel Fee Lands
<b>6.4.1AA</b>	Abstract for SJSP Fee Lands – Southern Area
<b>6.4.1BB</b>	Abstract for SJSP Lands – Northern Area
<b>7.1.1.1A</b>	Inventory of All irrigation uses (Navajo)
<b>7.1.1.1B</b>	Inventory of All irrigation uses (Hopi)
<b>7.1.1.2A</b>	Table of All Navajo Nation Designated Historic Irrigation Projects
<b>7.1.1.2B</b>	Table of All Hopi Tribe Designated Historic Irrigation Projects

<b>Exhibit #</b>	<b>Description</b>
<b>7.1.1.2C</b>	Table of All Joint Navajo Nation and Hopi Tribe Historic Irrigation Projects
<b>7.1.1.2D</b>	Map of Designated Historic Irrigation Projects
<b>7.1.2.3</b>	Table of Aggregate Capacity of Surface Water Impoundments by Main Wash Drainage
<b>7.2.3.5.3</b>	Map of N-Aquifer Boundary Springs
<b>7.2.3.5.4</b>	Map of Pasture Canyon Springs buffer zone
<b>8.2.1.1A</b>	Abstract of Surface Water Uses – AZ Game & Fish, Chevelon Cr. Wildlife Area, Chevelon Canyon Lake
<b>8.2.1.1B</b>	Abstracts of Existing Surface Water Uses – Bar T Bar Ranch
<b>8.2.1.1C</b>	Abstracts of Existing Surface Water Uses – Flying M Ranch
<b>8.2.1.1D</b>	Abstracts of Existing Surface Water Uses – City of Flagstaff
<b>8.2.1.1E</b>	Abstracts of Existing Surface Water Uses – Grover Hill Irrigation
<b>8.2.1.1F</b>	Abstract of Existing Surface Water Uses – SRP C.C. Cragin Reservoir
<b>8.2.1.1G</b>	Abstracts of Existing Surface Water Uses – City of Show Low
<b>8.2.1.1H</b>	Abstracts of Existing Surface Water Uses– Show Low Pinetop Woodland Irrigation Co.
<b>8.2.1.1I</b>	Abstracts of Existing Surface Water Uses – Silver Creek Irrigation District
<b>8.2.1.1J</b>	Abstracts of Existing Surface Water Uses – City of Winslow
<b>8.3A</b>	Abstracts of Surface Water Uses for Zuni Lands
<b>8.3B</b>	Zuni Indian Tribe Water Rights Settlement Judgment and Decree
<b>8.5.2</b>	Map of two Wells located on Atkinson Trading Company Inholding
<b>8.5.3</b>	The Balleau groundwater rebuttal report
<b>8.5.4</b>	Abstract for the withdrawal and Use of Water from two Wells located on Atkinson Trading Company Inholding
<b>8.8.2</b>	Map of LCR HUC
<b>8.8.3</b>	Map of City of Flagstaff Lake Mary Reservoirs within Lake Mary Watershed
<b>9.10</b>	Side Agreement between Navajo, Hopi, and the US as Trustee, Bar T Bar, and ASLD
<b>12.5.3</b>	Map of Side Rock-Moenkopi Groundwater Project right-of-way
<b>12.5.4</b>	Map of NTUA (Questar) right-of-way
<b>13.1</b>	Waiver, Release, and Retention of Claims for Water Rights and Injury to Water Rights and Injury to Water by the Navajo Nation on Behalf of the Navajo Nation and The Members of the Navajo Nation (but not Members in the Capacity of the Members as Navajo Allottees), and the United States, Acting as Trustee for the Navajo Nation and the Members of the Navajo Nation (but not the Members in the Capacity of the Members as Navajo Allottees)
<b>13.2</b>	Waiver, Release, and Retention of Claims for Water Rights, Injury to Water Rights, and Injury to Water by the United States, Acting as Trustee for the Navajo Allottees

<b>Exhibit #</b>	<b>Description</b>
<b>13.3</b>	Waiver, Release, and Retention of Claims for Water Rights, Injury to Water Rights, and Injury to Water by the Navajo Nation, on Behalf of the Navajo Nation and the Members of the Navajo Nation (but not Members I the Capacity of the Members as Navajo Allottees), against the United States
<b>13.4</b>	Waiver, Release, and Retention of Claims by the United States in all Capacities (Except as Trustee for an Indian Tribe other than the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe) against the Navajo Nation and the Members of the Navajo Nation
<b>13.5</b>	Waiver, Release, and Retention of Claims by parties, other than the Navajo Nation on behalf of the Navajo Nation and the Member of the Navajo Nation, and the United States acting as Trustee for the Navajo Nation, the Members of the Navajo Nation and the Navajo Allottees
<b>13.6</b>	Waiver, Release, and Retention of Claims for Water Rights, Injury to Water Rights, and Injury to Water by the Hopi Tribe, on behalf of the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), and the United States, acting as Trustee for the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees)
<b>13.7</b>	Waiver, Release, and Retention of Claims for Water Rights, Injury to Water Rights, and Injury to Water by the United States, acting as Trustee for the Hopi Allottees
<b>13.8</b>	Waiver, Release, and Retention of Claims for Water Rights, Injury to Water Rights, and Injury to Water by the Hopi Tribe, on behalf of the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the Capacity of the Members as Hopi Allottees), against the United States
<b>13.9</b>	Waiver, Release, and Retention of Claims by the United States in all capacities (except as Trustee for an Indian Tribe other than the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe) against the Hopi Tribe and the Members of the Hopi Tribe
<b>13.10</b>	Waiver, Release, and Retention of Claims by the Parties, other than the Hopi Tribe on behalf of the Hopi Tribe and the Members of the Hopi Tribe, and the United States Acting as Trustee for the Hopi Tribe, the Members of the Hopi Tribe and the Hopi Allottees
<b>13.11</b>	Waiver, Release, and Retention of Claims for Water Rights, Injury to Water Rights, and Injury to Water by the San Juan Southern Paiute Tribe, on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, and the United States, acting as Trustee for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe

<b>Exhibit #</b>	<b>Description</b>
<b>13.12</b>	Waiver, Release, and Retention of Claims for Water Rights, Injury to Water Rights, and Injury to Water by the San Juan Southern Paiute Tribe, on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, against the United States
<b>13.13</b>	Waiver, Release, and Retention of Claims by the United States in all capacities (except as Trustee for an Indian Tribe other than the Navajo Nation, The Hopi Tribe, and the San Juan Southern Paiute Tribe) against the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe
<b>13.14</b>	Waiver, Release, and Retention of Claims by parties other than the San Juan Southern Paiute Tribe on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, and the United States acting as Trustee for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe
<b>15.7.1</b>	Motion for Stay of Litigation
<b>15.7.2</b>	Stipulation Regarding Withdrawal of Objections and Agreements to not Object
<b>15.18</b>	Form Notice

**4.0 NAVAJO NATION WATER RIGHTS**

The Navajo Nation, Navajo Allottees, and the United States acting as trustee for the Navajo Nation and Navajo Allottees, shall have the rights to use Water as described in this Paragraph.

**4.1 GENERALLY APPLICABLE PROVISIONS**

4.1.1 The Navajo Nation’s Water Rights described in this Paragraph 4.0 may be used for any purpose consistent with this Agreement, the LCR Decree, and the Gila River Adjudication Decree.

4.1.2 The United States shall enter into contracts with the Navajo Nation, as necessary, for delivery of any of the Water Rights described in this Paragraph 4.0.

4.1.3. The Navajo Nation shall provide ADWR with a copy of any proposed contract for the Off-Reservation lease, exchange or storage of Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water at least sixty (60) days prior to execution to allow ADWR to determine whether the contract complies with the terms of this Agreement and the Act. The proposed contract may have financial information redacted.

4.1.4 Water Rights Held in Trust. The Water Rights described in Subparagraphs 4.2, 4.4, 4.5, 4.6, 4.7, and 4.9 shall be held in trust by the United States for the benefit of the Navajo Nation and Navajo Allottees. Water Rights held in trust by the United States for the benefit of the Navajo Nation and Navajo Allottees shall not be subject to loss through non-use, forfeiture, or abandonment.

4.1.5 The Navajo Nation shall have the right to store in a Reservoir on the Navajo Reservation any Water supply that it has a right to use, in accordance with applicable tribal and federal laws and subject to this Agreement. Notwithstanding Subparagraph 3.1.112, Navajo Reservation, as used in this Subparagraph 4.1.5, shall not include lands taken into trust as part of the Navajo Reservation subsequent to the Effective Date.

4.1.6 Except as provided in Paragraph 7.0, nothing in this Agreement shall be construed to prohibit the Navajo Nation from initiating New Surface Water Uses for Irrigation by means of direct Diversion of Surface Water on the Navajo Reservation. Notwithstanding Subparagraph 3.1.112, Navajo Reservation, as used in this Subparagraph 4.1.6, shall not include lands taken into trust as part of the Navajo Reservation subsequent to the Effective Date.

## **4.2 UNDERGROUND WATER**

The Navajo Nation, and the United States acting as trustee for the Navajo Nation and the Navajo Allottees, shall have the right to all Underground Water on the Navajo Reservation, subject to the provisions on the Use of the N-Aquifer described in Subparagraph 7.2.

## **4.3 EFFLUENT**

4.3.1 The Navajo Nation shall have the right to Effluent developed on the Navajo Reservation, which may be used for such purposes as the Navajo Nation may determine.

4.3.2 Effluent developed by the Navajo Nation on lands held in trust by the United States for the benefit of the Navajo Nation, but located outside of the Navajo Reservation, or on Public Domain Allotments outside the Navajo Reservation may be used on the Navajo Reservation or on lands held in trust by the United States for the benefit of the Navajo Nation or on Public Domain Allotments outside the Navajo Reservation for such purposes as the Navajo Nation may determine, subject to applicable law.

4.3.3 Effluent developed by the Navajo Nation on land owned in fee by the Navajo Nation, but located outside of the Navajo Reservation, may be used by the Navajo Nation for such purposes as the Navajo Nation may determine, subject to State law.

## **4.4 SPRINGS**

The Navajo Nation, and the United States acting as trustee for the Navajo Nation and the Navajo Allottees, shall have the right to all springs on the Navajo Reservation, subject to the provisions in Paragraph 7.0.

#### **4.5 LITTLE COLORADO RIVER TRIBUTARIES**

4.5.1 The Navajo Nation shall have the right to Divert and Deplete all Surface Water that flows within the Navajo Reservation in water courses north of and tributary to the LCR, subject to the provisions of Subparagraph 7.1, and provided that such Diversions and Depletions shall not interfere with or diminish Existing Surface Water Uses.

4.5.2 The Navajo Nation shall have the right to Divert and Deplete all Surface Water that reaches the Navajo Reservation in water courses south or west of and tributary to the LCR, provided that such Diversions and Depletions shall not interfere with or diminish Existing Surface Water Uses.

#### **4.6 LITTLE COLORADO RIVER MAINSTEM**

4.6.1 The Navajo Nation shall have the right to Divert and Deplete any Surface Water of the LCR mainstem that reaches the Navajo Reservation. The physical withdrawal of Water from the alluvium of the LCR on the Navajo Reservation by the Navajo Nation, Navajo Allottees, or the United States acting as trustee for the Navajo Nation and Navajo Allottees, shall be considered to be a Diversion of Surface Water. Between 2001 and 2021, the average United States Geological Survey gage flow of the LCR near Winslow, Arizona, that reached the Navajo Reservation was approximately 122,000 AFY. Nothing in this Subparagraph shall be construed as a guarantee that such quantity will reach the Navajo Reservation. Notwithstanding Subparagraph 3.1.112, Navajo Reservation, as used in this Subparagraph 4.6.1, shall not include lands taken into trust as part of the Navajo Reservation subsequent to the Effective Date.

4.6.2 The Navajo Nation shall have the right to Divert and Deplete up to 40,780 AFY of Surface Water from the LCR in the quantities and with the priorities described below:

<b>HISTORIC PROJECT (Locations described in Exhibit 4.6.2)</b>	<b>ACREAGE (acres)</b>	<b>DIVERSION QUANTITY (AFY)</b>	<b>PRIORITY</b>
Beaver Farms	99	495	Nov. 14, 1901
Bird Springs	1673	8365	Nov. 14, 1901
Black Falls	1460	7300	Jan. 8, 1900
Cameron Farms	154	770	Jan. 8, 1900
	20	100	May 7, 1917
	5	20	July 14, 1934
Grand Falls	191	955	Nov. 14, 1901
Leupp Farms	1900	9500	Nov. 14, 1901
North Leupp	69	345	Nov. 14, 1901
Sunrise Fields	407	2035	Nov. 14, 1901
	1019	5095	July 14, 1934
Tolchico	359	1795	Nov. 14, 1901
Scattered Fields	318	1590	Jan. 8, 1900
	370	1850	Nov. 14, 1901
	113	565	July 14, 1934

4.6.3 Neither the Navajo Nation, nor the United States acting as trustee for the Navajo Nation or Navajo Allottees, shall make calls or exercise rights of priority, in the LCR

Adjudication or any other judicial or administrative proceeding, against upstream or downstream Off-Reservation Uses of Water in the LCR Watershed with priority dates earlier than the Effective Date to satisfy the Navajo Nation's historic, existing, and future Uses.

4.6.4 In order to protect its right to the flows of the LCR that reach the Navajo Reservation, as set forth in Subparagraph 4.6.2, and except as provided in Paragraph 8.0, the Navajo Nation or the United States acting as trustee for the Navajo Nation or Navajo Allottees, and in consultation with the Navajo Nation, may make calls and exercise rights of priority against upstream or downstream Off-Reservation New Surface Water Uses in the LCR Watershed.

4.6.5 Neither the Navajo Nation, nor the United States acting as trustee for the Navajo Nation or Navajo Allottees, shall make calls or exercise rights of priority for instream flow Uses.

4.6.6 For Water described in Subparagraph 4.6.2, the Navajo Nation may forbear its senior priority to junior users Off-Reservation pursuant to State law.

#### **4.7 NAVAJO NATION UPPER BASIN COLORADO RIVER WATER**

4.7.1 The State expressly agrees to the allocation of Upper Basin Colorado River Water to the Navajo Nation as provided in this Subparagraph 4.7 and pursuant to section 6 of the Act.

4.7.2 The Navajo Nation shall have the right to 44,700 AFY of Upper Basin Colorado River Water.

4.7.3 The Navajo Nation shall have the right to Divert Navajo Nation Upper Basin Colorado River Water in Arizona, Utah, and New Mexico and to transport Navajo Nation Upper Basin Colorado River Water for Use only within the State.

4.7.4 The Navajo Nation shall have the right to Navajo Nation Upper Basin Colorado River Water for Use in the Upper Basin and the Lower Basin in the State.

4.7.5 The Navajo Nation shall have the right to store Navajo Nation Upper Basin Colorado River Water in the Navajo Reservoir and the Frank Chee Willetto, Sr. Reservoir, in New Mexico, for Use in the State. Any storage of Navajo Nation Upper Basin Colorado River Water in the Navajo Reservoir and the Frank Chee Willetto, Sr. Reservoir shall be credited against the State's Upper Basin apportionment in the year in which the Diversion for storage in the Reservoir occurs. Such Water shall be accounted for and reported by the Secretary separately from any other Water stored in the Navajo Reservoir and the Frank Chee Willetto Sr. Reservoir.

4.7.6 The Navajo Nation may store Navajo Nation Upper Basin Colorado River Water at underground storage facilities or Groundwater savings facilities located: (a) within the Navajo Reservation in accordance with Navajo law, or State law if mutually agreed to by the Navajo Nation and the State; (b) on any other Indian reservation located in the State in accordance with applicable law; and (c) within the State and outside of any Indian reservation in accordance with State law. The Navajo Nation may assign any long-term storage credits accrued as a result of storage under this Subparagraph in accordance with applicable law. Any Water stored pursuant to tribal law may only be recovered on the Indian reservation where the Water was stored.

4.7.7 The Navajo Nation shall have the right to use the Colorado River and the San Juan River as a conveyance mechanism to convey Navajo Nation Upper Basin Colorado River Water from the Upper Basin to the Lower Basin for Use within the State.

4.7.8 With the approval of the Secretary, the Navajo Nation may lease or exchange any portion of Navajo Nation Upper Basin Colorado River Water for Use in the Upper Basin or Lower Basin in the State. Such leased or exchanged Navajo Nation Upper Basin Colorado River Water shall be deemed a federal resource held in trust for the benefit of the Navajo Nation to which the lessee or exchanging party shall acquire only a leasehold or limited interest for the term of the lease or exchange agreement. By leasing or exchanging such Water, the Navajo Nation shall not forfeit or abandon or lose to non-use its rights to Navajo Nation Upper Basin Colorado River Water. A lease or exchange agreement under this Subparagraph shall provide that the Water received from the Navajo Nation shall be used in accordance with applicable law. The non-use of all or any portion of Navajo Nation Upper Basin Colorado River Water by a lessee or exchange party shall not result in the loss through non-use, forfeiture, or abandonment of any portion of the Navajo Nation Upper Basin Colorado River Water.

4.7.9 The Navajo Nation, or any Person who leases or exchanges Navajo Nation Upper Basin Colorado River Water, may transport such Water through the CAP System in accordance with all laws of the United States and the agreements between the United States and CAWCD governing the use of the CAP System to transport water other than CAP water.

#### **4.8 NAVAJO NATION CIBOLA WATER**

4.8.1 Pursuant to the assignment, transfer, and assumption of rights, interests, and obligations described in this Subparagraph 4.8.1, the Navajo Nation shall have the right to Divert and consumptively use: (a) 100 AFY of Cibola Water at the location and for the same Use as exists in the Hopi Tribe Existing Cibola Contract; or (b) 71.5 AFY of Cibola Water at locations and for uses other than as described in the Hopi Tribe Existing Cibola Contract. Effective as of the Enforceability Date:

4.8.1.1 The Hopi Tribe hereby assigns and transfers to the Navajo Nation all rights, interests, and obligations under the Hopi Tribe Existing Cibola Contract for a Diversion of up to 100 AFY of Cibola Water;

4.8.1.2 The Hopi Tribe hereby relinquishes all of the Hopi Tribe's rights, interests, and obligations under the Hopi Tribe Existing Cibola Contract for a Diversion of up to 100 AFY of Cibola Water; and

4.8.1.3 The Navajo Nation hereby assumes all of the Hopi Tribe's rights to, interests in, and obligations for 100 AFY of Cibola Water, which equates to: (a) a volume of 100 AFY when the Navajo Nation Diverts the Water at the same location and for the same Use as exists in the Hopi Tribe Existing Cibola Contract; or (b) 71.5 AFY of Navajo Nation Cibola Water, at locations and for uses other than as described in the Existing Hopi Tribe Cibola Contract.

4.8.1.4 The Hopi Tribe and the Navajo Nation shall further memorialize the assignment, transfer, and assumption described in this Subparagraph by executing and delivering such further documentation as may reasonably be required by

Reclamation, including an assignment and transfer of a portion of the entitlement relating to the Hopi Tribe Existing Cibola Contract.

4.8.2 Pursuant to Subparagraph 4.8 and as authorized in section 6 of the Act, the State recommends the allocation to the Navajo Nation of 100 AFY of Cibola Water, which equates to a volume of: (a) 100 AFY when the Navajo Nation Diverts the Water at the same location and for the same Use as exists in the Hopi Tribe Existing Cibola Contract; or (b) 71.5 AFY of Navajo Nation Cibola Water at locations and for Uses other than as described in the Hopi Tribe Existing Cibola Contract.

4.8.3 The Navajo Nation shall have the right to Navajo Nation Cibola Water for Use in the Upper Basin and the Lower Basin in the State. The Navajo Nation shall have the right to Divert Navajo Nation Cibola Water in Arizona, Utah, and New Mexico, and to transport Navajo Nation Cibola Water for Use only within the State pursuant to the Navajo Nation Water Delivery Contracts to be included as exhibits to this Agreement pursuant to Subparagraph 14.1.1.2.

4.8.4 The Navajo Nation shall have the right to store Navajo Nation Cibola Water in the Navajo Reservoir and the Frank Chee Willetto, Sr. Reservoir in New Mexico, for Use in the State. Any storage of Navajo Nation Cibola Water in the Navajo Reservoir or the Frank Chee Willetto, Sr. Reservoir shall be credited against the State's Lower Basin apportionment in the year in which the Diversion for storage in the Navajo Reservoir and Frank Chee Willetto, Sr. Reservoir occurs. Such Navajo Nation Cibola Water shall be accounted for and reported by the Secretary separately from any other water stored in the Navajo Reservoir and the Frank Chee Willetto, Sr. Reservoir.

4.8.5 The Navajo Nation may store Navajo Nation Cibola Water at underground storage facilities or Groundwater savings facilities located: (a) within the Navajo Reservation in accordance with Navajo law, or State law if mutually agreed to by the Navajo Nation and the State; (b) on any other Indian reservation located in the State in accordance with applicable law; and (c) within the State and outside of any Indian reservation in accordance with State law. The Navajo Nation may assign any long-term storage credits accrued as a result of storage under this Subparagraph in accordance with applicable law. Any Water stored pursuant to tribal law may only be recovered on the Indian reservation where the Water was stored.

4.8.6 With approval of the Secretary, the Navajo Nation may lease or exchange any portion of Navajo Nation Cibola Water for Use in the Upper Basin and Lower Basin of the State, to which the lessee or exchange party shall acquire only a leasehold or limited interest for the term of the lease or exchange agreement. By leasing or exchanging Navajo Nation Cibola Water, the Navajo Nation shall not forfeit, abandon, or lose to non-use its rights to Navajo Nation Cibola Water. The non-use of all or any portion of Navajo Nation Cibola Water by a lessee or exchange party shall not result in the loss through non-use, forfeiture, or abandonment of any portion of Navajo Nation Cibola Water. A lease or exchange agreement under this Subparagraph shall provide that Navajo Nation Cibola Water shall be used in accordance with applicable law.

4.8.7 The Navajo Nation, or any Person who leases or exchanges Navajo Nation Cibola Water, may transport such Water through the CAP System in accordance with all

laws of the United States and the agreements between the United States and CAWCD governing the use of CAP System to transport water other than CAP water.

#### **4.9 NAVAJO NATION FOURTH PRIORITY WATER**

4.9.1 The State recommends the allocation of Fourth Priority Colorado River Water to the Navajo Nation as provided in this Subparagraph 4.9 and pursuant to section 6 of the Act.

4.9.2 The Navajo Nation shall have the right to Divert up to 3,500 AFY of Fourth Priority Water. The Navajo Nation shall have the right to Divert Navajo Nation Fourth Priority Water in Arizona, Utah, and New Mexico and to transport Navajo Nation Fourth Priority Water for Use only within the State.

4.9.3 The Navajo Nation shall have the right to Navajo Nation Fourth Priority Water for Use in the Upper Basin and the Lower Basin in the State.

4.9.4 The Navajo Nation shall have the right to store Navajo Nation Fourth Priority Water in the Navajo Reservoir and the Frank Chee Willetto, Sr. Reservoir in New Mexico, for Use in the State. Any storage of Navajo Nation Fourth Priority Water shall be credited against the State's Lower Basin apportionment in the year in which the Diversion for storage in the Navajo Reservoir or the Frank Chee Willetto, Sr. Reservoir occurs. Such Navajo Nation Fourth Priority Water shall be accounted for and reported by the Secretary separately from any other water stored in the Navajo Reservoir and Frank Chee Willetto, Sr. Reservoir.

4.9.5 The Navajo Nation may store Navajo Nation Fourth Priority Water at underground storage facilities or Groundwater savings facilities located: (a) within the Navajo Reservation in accordance with Navajo law, or State law if mutually agreed to by the Navajo Nation and the State; (b) on any other Indian reservation located in the State in accordance with applicable law; and (c) within the State and outside of any Indian reservation in accordance with State law. The Navajo Nation may assign any long-term storage credits accrued as a result of storage under this Subparagraph in accordance with applicable law. Any Water stored pursuant to tribal law may only be recovered on the Indian reservation where the Water was stored.

4.9.6 With approval of the Secretary, the Navajo Nation may lease or exchange any portion of Navajo Nation Fourth Priority Water for Use in the Upper Basin or Lower Basin in the State. Such leased or exchanged Navajo Nation Fourth Priority Water shall be deemed a federal resource held in trust for the benefit of the Navajo Nation to which the lessee or exchanging parties shall acquire only a leasehold or limited interest for the term of the lease or exchange agreement. By leasing or exchanging such Water, the Navajo Nation shall not forfeit or abandon or lose to non-use its rights to Navajo Nation Fourth Priority Water. A lease or exchange agreement under this Subparagraph shall provide that the Water received from the Navajo Nation shall be used in accordance with applicable law. The non-use of all or any portion of Navajo Nation Fourth Priority Water by a lessee or exchange party shall not result in the loss through non-use, forfeiture, or abandonment of any portion of the Navajo Nation Fourth Priority Water.

4.9.7 The Navajo Nation, or any Person who leases or exchanges Navajo Nation Fourth Priority Water, may transport such Water through the CAP System in accordance with all laws of the United States and the agreements between the United States and CAWCD governing the use of the CAP System to transport water other than CAP water.

#### **4.10 RIGHTS OF NAVAJO ALLOTTEES**

4.10.1 The rights of Navajo Allottees, and the United States acting as trustee for Navajo Allottees, to use Water on Navajo Allotments located on the Navajo Reservation shall be satisfied solely from the Water Rights described in this Paragraph 4.0 and be subject to the terms thereof.

4.10.2 The provisions of section 7 of the Act of February 8, 1877, 24 Stat. 390, ch. 119; 25 U.S.C. § 381, shall apply to the Water Rights identified in Subparagraph 4.1.2.

4.10.3 The rights of Navajo Allottees shall be enforceable as follows:

4.10.3.1 Before asserting any claim against the United States under section 7 of the Act of February 8, 1887, 24 Stat. 390, ch. 199; 25 U.S.C. § 381, or any other applicable law, a Navajo Allottee shall exhaust remedies available under the Navajo Nation Water Code or other applicable Navajo law.

4.10.3.2 After the exhaustion of all remedies available under the Navajo Nation Water Code or other applicable Navajo law, a Navajo Allottee may seek relief under section 7 of the Act of February 8, 1887, 24 State. 390, ch. 119; 25 USC § 381, or other applicable law.

4.10.3.3 The Secretary shall have authority to protect the rights of Navajo Allottees in accordance with this Subparagraph.

4.10.4 To the extent necessary, and subject to the approval of the Secretary, the Navajo Nation shall amend the Navajo Nation Water Code to provide:

4.10.4.1 that use of Water by Navajo Allottees shall be satisfied with Water from the Water Rights described in Subparagraph 4.1.4;

4.10.4.2 a process by which a Navajo Allottee may request that the Navajo Nation provide Water in accordance with this Agreement, including the provision of Water under any Navajo Allottee lease under section 4 of the Act of June 25, 1910, 36 Stat. 856, ch. 431; 25 U.S.C. § 403;

4.10.4.3 a due process system for the consideration and determination by the Navajo Nation of any request of a Navajo Allottee (or a successor in interests to a Navajo Allottee) for an allocation of Water on a Navajo Allotment, including a process for:

4.10.4.3.1 appeal and adjudication of any denied or disputed distribution of Water; and

4.10.4.3.2 resolution of any contested administrative decision.

4.10.4.4 a requirement that any Navajo Allottee asserting a claim relating to the enforcement of rights of the Navajo Allottee under the Navajo Nation Water Code, including to the quantity of Water allocated to land of the Navajo Allottee,

shall exhaust all remedies available to the Navajo Allottee under Navajo law before initiating an action against the United States or petitioning the Secretary pursuant to subparagraph 4.10.3.

4.10.5 During the period beginning on the Enactment Date and ending on the date on which a Navajo Nation Water Code is amended as described in Subparagraphs 4.10.3 and 4.10.4, the Secretary shall administer, with respect to the rights of the Navajo Allottees, the Water Rights identified in Subparagraph 4.1.3.

4.10.6 The Navajo Nation Water Code amendments described in Subparagraph 4.10.4 shall not be valid unless the provisions of the Navajo Nation Water Code required by Subparagraph 4.10.4 are approved by the Secretary.

4.10.7 Each subsequent amendment to the Navajo Nation Water Code that affects the rights of a Navajo Allottee shall also be approved by the Secretary.

4.10.8 The Secretary shall approve or disapprove the Navajo Nation Water Code amendments described in Subparagraphs 4.10.4 and 4.10.6 not later than 180 days after the date on which the amendments are submitted to the Secretary. This deadline may be extended by the Secretary after consultation with the Navajo Nation.

#### **4.11 WATER RIGHTS AND USES OF WATER FOR LANDS OWNED IN FEE BY THE NAVAJO NATION AS OF THE EFFECTIVE DATE—LCR WATERSHED**

4.11.1 As of the Effective Date, the Navajo Nation owns lands in fee that are located outside the exterior boundaries of the Navajo Reservation within the LCR Watershed, as set forth in Exhibit 4.11.1A. Subject to the terms of this Agreement, the Navajo Nation shall

continue to have all Water Rights and Uses of Water existing under State law as of the Effective Date that are appurtenant to or associated with such fee lands, as described in the Abstracts attached as Exhibits 4.11.1B and 4.11.1C. Such Water Rights and Uses of Water shall not be subject to objection, dispute, or challenge by the Parties in the LCR Adjudication or in any other judicial or administrative proceeding. After incorporation in the LCR Decree, such Water Rights and Uses shall be binding on all parties to the LCR Adjudication. Exhibits 4.11.1A, 4.11.1B, and 4.11.1C may be supplemented upon application to the LCR Adjudication Court before the Enforceability Date to correct errors and omissions.

4.11.2 In addition to the Water Rights and Uses of Water for the lands described in Subparagraph 4.11.1, after the Effective Date but before the Enforceability Date, the Navajo Nation may obtain new Water Rights and initiate new Uses of Water for such fee lands, including changing the manner or place of Use of Water Rights, as permitted by State law and this Agreement. The Navajo Nation shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands after the Effective Date but before the Enforceability Date. All such Abstracts must be completed on or before the Enforceability Date. The Navajo Nation shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

4.11.3 After the Enforceability Date, the Navajo Nation may obtain new Water Rights or initiate new Uses of Water for the lands described in Subparagraph 4.11.1, including changing manner or place of Use of Water Rights, as permitted by State law and this Agreement. The Navajo Nation shall complete Abstracts for all Water Rights and Uses of

Water obtained or initiated for such fee lands by the Navajo Nation after the Enforceability Date and shall promptly move to supplement the LCR Decree to include the Abstracts for such additional or modified Water Rights and Uses of Water.

4.11.4 If the Abstracts described in Subparagraphs 4.11.1, 4.11.2, and 4.11.3 are agreed to by all of the Parties before being submitted to the LCR Adjudication Court for approval (which agreement shall not be unreasonably withheld, conditioned, or delayed), the Water Rights and Uses of Water described in such Abstracts shall not be subject to objection, dispute, or challenge by the Parties in the LCR Adjudication or any other judicial or administrative proceeding. If the Abstracts described in Subparagraphs 4.11.1, 4.11.2, and 4.11.3 are not agreed to by all of the Parties before their submission to the LCR Adjudication Court for approval, the Parties who are not in agreement may object to the incorporation of all or portions of such Abstracts in the LCR Decree. After the incorporation of the Abstracts described in Subparagraphs 4.11.1, 4.11.2, and 4.11.3 in the LCR Decree, such Abstracts shall be binding on all parties to the LCR Adjudication.

**4.12 WATER RIGHTS AND USES OF WATER FOR LANDS ACQUIRED BY THE NAVAJO NATION IN FEE, OR TAKEN INTO TRUST BY THE UNITED STATES FOR THE BENEFIT OF THE NAVAJO NATION, AFTER THE EFFECTIVE DATE BUT BEFORE THE ENFORCEABILITY DATE—LCR WATERSHED**

4.12.1 Lands within the LCR Watershed acquired by the Navajo Nation in fee, or taken into trust by the United States for the benefit of the Navajo Nation, after the Effective Date but before the Enforceability Date, shall be subject to any applicable limitations imposed by this Agreement and are entitled to any applicable benefits provided by this Agreement, including Water Rights and Uses of Water appurtenant to or associated with

the lands that were held by the grantor or transferor of the lands and included in the transaction. The Navajo Nation shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such fee lands acquired by the Navajo Nation, unless previously decreed by the LCR Adjudication Court. The United States shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such trust lands, unless previously decreed by the LCR Adjudication Court. All such Abstracts must be completed on or before the Enforceability Date. The Navajo Nation or the United States, whichever completed the Abstracts, shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional Water Rights and Uses of Water.

4.12.2 The Navajo Nation, or the United States acting as trustee for the Navajo Nation in consultation with and upon the agreement of the Navajo Nation, may obtain new Water Rights or initiate new Uses of Water for the lands described in Subparagraph 4.12.1, including changing the manner or place of Use of Water Rights, after the date of their acquisition but before the Enforceability Date as follows: (a) for lands acquired by the Navajo Nation in fee, as permitted by State law and this Agreement; and (b) for lands taken into trust by the United States for the benefit of the Navajo Nation, in accordance with applicable law and this Agreement. The Navajo Nation shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands. The United States shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such trust lands. All such Abstracts must be completed on or before the Enforceability Date. The Navajo Nation or the United States, whichever completed the Abstracts, shall

promptly move to supplement the LCR Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

4.12.3 The Navajo Nation, or the United States acting as trustee for the Navajo Nation in consultation with and upon the agreement of the Navajo Nation, may obtain new Water Rights or initiate new Uses of Water, including changing the manner or place of Use of Water Rights, after the Enforceability Date for the lands described in Subparagraph 4.12.1 as follows: (a) for lands acquired by the Navajo Nation in fee, as permitted by State law and this Agreement; and (b) for lands taken into trust by the United States for the benefit of the Navajo Nation, in accordance with applicable law and this Agreement. The Navajo Nation shall promptly complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands. The United States shall promptly complete Abstracts for all Water Rights and Uses of Water for such trust lands. The Navajo Nation or the United States, whichever completed the Abstract, shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

4.12.4 If the Abstracts described in Subparagraphs 4.12.1, 4.12.2, and 4.12.3 are agreed to by all of the Parties before being submitted to the LCR Adjudication Court for approval (which agreement shall not be unreasonably withheld, conditioned, or delayed), the Water Rights and Uses of Water described in such Abstracts shall not be subject to objection, dispute, or challenge by the Parties in the LCR Adjudication or any other judicial or administrative proceeding. If the Abstracts described in Subparagraphs 4.12.1, 4.12.2, and 4.12.3 are not agreed to by all of the Parties before being submitted to the LCR

Adjudication Court for approval, the Parties who are not in agreement may object to the incorporation of all or portions of such Abstracts in the LCR Decree. After the incorporation of the Abstracts described in Subparagraphs 4.12.1, 4.12.2, and 4.12.3 in the LCR Decree, such Abstracts shall be binding on all parties to the LCR Adjudication.

**4.13 WATER RIGHTS AND USES OF WATER FOR LANDS ACQUIRED BY THE NAVAJO NATION IN FEE, OR TAKEN INTO TRUST BY THE UNITED STATES FOR THE NAVAJO NATION, AFTER THE ENFORCEABILITY DATE—LCR WATERSHED**

4.13.1 Lands within the LCR Watershed acquired by the Navajo Nation in fee, or taken into trust by the United States for the benefit of the Navajo Nation, after the Enforceability Date shall be subject to any applicable limitations imposed by this Agreement, and are entitled to any applicable benefits provided by this Agreement, including Water Rights and Uses of Water appurtenant to or associated with the lands that were held by the grantor or transferor of the lands and included in the transaction. The Navajo Nation shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such fee lands, unless previously decreed by the LCR Adjudication Court. The United States shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such trust lands, unless previously decreed by the LCR Adjudication Court. The Navajo Nation or the United States, whichever completed the Abstract, shall promptly move to supplement the LCR Decree to include the Abstracts for such additional Water Rights and Uses of Water.

4.13.2 The Navajo Nation, or the United States acting as trustee for the Navajo Nation in consultation with and upon the agreement of the Navajo Nation, may obtain new Water Rights or initiate new Uses of Water for the lands described in Subparagraph 4.13.1,

including changing the manner or place of Use of Water Rights, after the Enforceability Date as follows: (a) for lands acquired by the Navajo Nation in fee, as permitted by State law and this Agreement; and (b) for lands taken into trust by the United States for the benefit of the Navajo Nation, in accordance with applicable law and this Agreement. The Navajo Nation shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands. The United States shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such trust lands. The Navajo Nation or the United States, whichever completed the Abstract, shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

4.13.3 If the Abstracts described in Subparagraphs 4.13.1 and 4.13.2 are agreed to by all of the Parties before being submitted by the Navajo Nation to the LCR Adjudication Court for approval (which agreement shall not be unreasonably withheld, conditioned, or delayed), the Water Rights and Uses of Water described in such Abstracts shall not be subject to objection, dispute, or challenge by the Parties in the LCR Adjudication or any other judicial or administrative proceeding. If the Abstracts described in Subparagraphs 4.13.1 and 4.13.2 are not agreed to by all of the Parties before being submitted to the LCR Adjudication Court for approval, the Parties who are not in agreement may object to the incorporation of all or portions of such Abstracts in the LCR Decree. After the incorporation of the Abstracts described in Subparagraphs 4.13.1 and 4.13.2 in the LCR Decree, such Abstracts shall be binding on all parties to the LCR Adjudication.

**4.14 WATER RIGHTS AND USES OF WATER FOR LANDS OWNED IN FEE BY THE NAVAJO NATION AS OF THE EFFECTIVE DATE—VERDE RIVER SUBWATERSHED IN GILA RIVER ADJUDICATION**

4.14.1 As of the Effective Date, the Navajo Nation owns lands in fee that are located outside the exterior boundaries of the Navajo Reservation within the Verde River subwatershed in the Gila River Adjudication, as set forth in Exhibit 4.14.1A. Subject to the terms of this Agreement, the Navajo Nation shall continue to have all Water Rights and Uses of Water existing as of the Effective Date that are appurtenant to or associated with such fee lands, as described in the Abstracts attached as Exhibits 4.14.1B and 4.14.1C. Such Water Rights and Uses of Water shall not be subject to objection, dispute, or challenge by the Parties in the Gila River Adjudication or any other judicial or administrative proceeding. After incorporation in the Gila River Adjudication Decree, such Water Rights and Uses shall be binding on all parties to the Gila River Adjudication. Exhibits 4.14.1A, 4.14.1B, and 4.14.1C may be supplemented upon application to the Gila River Adjudication Court before the Enforceability Date to correct errors and omissions.

4.14.2 In addition to the Water Rights and Uses of Water for the lands described in Subparagraph 4.14.1, after the Effective Date but before the Enforceability Date, the Navajo Nation may obtain new Water Rights and initiate new Uses of Water for such fee lands, including changing the manner or place of Use, as permitted by State law and this Agreement. The Navajo Nation shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such lands after the Effective Date but before the Enforceability Date. All such Abstracts must be completed on or before the Enforceability Date. The Navajo Nation shall promptly move to supplement the Gila River Adjudication

Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

4.14.3 After the Enforceability Date, the Navajo Nation may obtain new Water Rights or initiate new Uses of Water for the lands described in Subparagraph 4.14.1, including changing manner or place of Use of Water Rights, as permitted by State law and this Agreement. The Navajo Nation shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands by the Navajo Nation after the Enforceability Date and shall promptly move to supplement the Gila River Adjudication Decree to include the Abstracts for such additional or modified Water Rights and Uses of Water.

4.14.4 If the Abstracts described in Subparagraphs 4.14.1, 4.14.2, and 4.14.3 are agreed to by all of the Parties before being submitted to the Gila River Adjudication Court for approval (which agreement shall not be unreasonably withheld, conditioned, or delayed), the Water Rights and Uses of Water described in such Abstracts shall not be subject to objection, dispute, or challenge by the Parties in the Gila River Adjudication or any other judicial or administrative proceeding. If the Abstracts described in Subparagraphs 4.14.1, 4.14.2, and 4.14.3 are not agreed to by all of the Parties before their submission to the Gila River Adjudication Court for approval, the Parties who are not in agreement may object to the incorporation of all or portions of such Abstracts in the Gila River Adjudication Decree. After the incorporation of the Abstracts described in Subparagraphs 4.14.1, 4.14.2, and 4.14.3 in the Gila River Adjudication Decree, such Abstracts shall be binding on all parties to the Gila River Adjudication.

**4.15 WATER RIGHTS AND USES OF WATER FOR LANDS ACQUIRED BY THE NAVAJO NATION IN FEE, OR TAKEN INTO TRUST FOR THE BENEFIT OF THE NAVAJO NATION, AFTER THE EFFECTIVE DATE BUT BEFORE THE ENFORCEABILITY DATE— VERDE RIVER SUBWATERSHED IN GILA RIVER ADJUDICATION**

4.15.1 Lands within the Verde River subwatershed in the Gila River Adjudication acquired by the Navajo Nation in fee, or taken into trust by the United States for the benefit of the Navajo Nation, after the Effective Date but before the Enforceability Date, shall be subject to any applicable limitations imposed by this Agreement and are entitled to any applicable benefits provided by this Agreement, including Water Rights and Uses of Water appurtenant to or associated with the lands that were held by the grantor or transferor of the lands and included in the transaction. The Navajo Nation shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such fee lands acquired by the Navajo Nation, unless previously decreed by the Gila River Adjudication Court. The United States shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such trust lands, unless previously decreed by the Gila River Adjudication Court. All such Abstracts must be completed on or before the Enforceability Date. The Navajo Nation or the United States, whichever completed the Abstracts, shall promptly move to supplement the Gila River Adjudication Decree to include the Abstracts for any such additional Water Rights and Uses of Water.

4.15.2 The Navajo Nation, or the United States acting as trustee for the Navajo Nation, and in consultation with and upon the agreement of the Navajo Nation, may obtain new Water Rights or initiate new Uses of Water described in Subparagraph 4.15.1, including changing the manner or place of Use of Water Rights, after the date of their acquisition but before the Enforceability Date as follows: (a) for lands acquired by the Navajo Nation in fee,

as permitted by State law and this Agreement; and (b) for lands taken into trust by the United States for the benefit of the Navajo Nation, in accordance with applicable law and this Agreement. The Navajo Nation shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands. The United States shall complete Abstracts for all such Water Rights and Uses of Water for such trust lands. All such Abstracts must be completed on or before the Enforceability Date. The Navajo Nation or the United States, whichever completed the Abstract, shall promptly move to supplement the Gila River Adjudication Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

4.15.3 The Navajo Nation, or the United States acting as trustee for the Navajo Nation, and in consultation with and upon the agreement of the Navajo Nation, may obtain new Water Rights or initiate new Uses of Water, including changing the manner or place of Use of Water Rights, after the Enforceability Date for the lands described in Subparagraph 4.15.1 as follows: (a) for lands acquired by the Navajo Nation in fee, as permitted by State law and this Agreement; and (b) for lands taken into trust by the United States for the benefit of the Navajo Nation, in accordance with applicable law and this Agreement. The Navajo Nation shall promptly complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands. The United States shall promptly complete Abstracts for all Water Rights and Uses of Water for such trust lands. The Navajo Nation or the United States, whichever completed the Abstracts, shall promptly move to supplement the Gila River Adjudication Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

4.15.4 If the Abstracts described in Subparagraphs 4.15.1, 4.15.2, and 4.15.3 are agreed to by all of the Parties before being submitted to the Gila River Adjudication Court for approval (which agreement shall not be unreasonably withheld, conditioned, or delayed), the Water Rights and Uses of Water described in such Abstracts shall not be subject to objection, dispute, or challenge by the Parties in the Gila River Adjudication or any other judicial or administrative proceeding. If the Abstracts described in Subparagraphs 4.15.1, 4.15.2, and 4.15.3 are not agreed to by all the Parties before being submitted to the Gila River Adjudication Court for approval, the Parties who are not in agreement may object to the incorporation of all or portions of such Abstracts in the Gila River Adjudication Decree. After the incorporation of the Abstracts described in Subparagraphs 4.15.1, 4.15.2, and 4.15.3 in the Gila River Adjudication Decree, such Abstracts shall be binding on all parties to the Gila River Adjudication.

**4.16 WATER RIGHTS AND USES OF WATER FOR LANDS ACQUIRED BY THE NAVAJO NATION IN FEE, OR TAKEN INTO TRUST BY THE UNITED STATES FOR THE NAVAJO NATION, AFTER THE ENFORCEABILITY DATE—VERDE RIVER SUBWATERSHED IN GILA RIVER ADJUDICATION**

4.16.1 Lands within the Verde River subwatershed in the Gila River Adjudication acquired by the Navajo Nation in fee, or taken into trust by the United States for the benefit of the Navajo Nation, after the Enforceability Date shall be subject to any applicable limitations imposed by this Agreement, are entitled to any applicable benefits provided by this Agreement, including Water Rights and Uses of Water appurtenant to or associated with the lands that were held by the grantor or transferor of the lands and included in the transaction. The Navajo Nation shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such fee lands, unless previously decreed by the

Gila River Adjudication Decree. The United States shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such trust lands, unless previously decreed in the Gila River Adjudication Decree. The Navajo Nation or the United States, whichever completed the Abstracts, shall promptly move to supplement the Gila River Adjudication Decree to include the Abstracts for such additional Water Rights and Uses of Water.

4.16.2 The Navajo Nation, or the United States acting as trustee for the Navajo Nation, and in consultation with and upon the agreement of the Navajo Nation, may obtain new Water Rights or initiate new Uses of Water for the lands described in Subparagraph 4.16.1, including changing the manner or place of Use of Water Rights, after the Enforceability Date as follows: (a) for lands acquired by the Navajo Nation in fee, as permitted by State law and this Agreement; and (b) for lands taken into trust by the United States for the benefit of the Navajo Nation, in accordance with applicable law and this Agreement. The Navajo Nation shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands. The United States shall complete Abstracts for all Water Rights and Uses of Water obtained for such trust lands. The Navajo Nation or the United States, whichever completed the Abstracts, shall promptly move to supplement the Gila River Adjudication Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

4.16.3 If the Abstracts described in Subparagraphs 4.16.1 and 4.16.2 are agreed to by all of the Parties before being submitted by the Navajo Nation to the Gila River Adjudication Court before being submitted for approval (which agreement shall not be

unreasonably withheld, conditioned, or delayed), the Water Rights and Uses of Water described in such Abstracts shall not be subject to objection, dispute, or challenge by the Parties in the Gila River Adjudication or any other judicial or administrative proceeding. If the Abstracts described in Subparagraphs 4.16.1 and 4.16.2 are not agreed to by all the Parties before being submitted to the Gila River Adjudication Court for approval, the Parties who are not in agreement may object to the incorporation of all or portions of such Abstracts in the Gila River Adjudication Decree. After the incorporation of the Abstracts described in Subparagraphs 4.16.1 and 4.16.2 in the Gila River Adjudication Decree, such Abstracts shall be binding on all parties to the Gila River Adjudication.

#### **4.17 AGREEMENT NOT TO OBJECT, DISPUTE, OR CHALLENGE**

Except as provided in Paragraph 7.0, the Parties shall not object to, dispute, or challenge the withdrawal or Use of Underground Water from any Well located on the Navajo Reservation, or the drilling or replacement of any Well for the withdrawal and Use of Underground Water on the Navajo Reservation, in the LCR Adjudication or any other judicial or administrative proceeding.

#### **4.18 PLACE OF USE FOR WATER RIGHTS AND USES OF WATER SUBJECT TO SETTLEMENT AGREEMENT**

4.18.1 The rights of the Navajo Nation, or the United States acting as trustee for the Navajo Nation, to the Water described in Subparagraphs 4.2, 4.4, 4.5, and 4.6 may be used anywhere on the Navajo Reservation, but may not be sold, leased, transferred, or in any way used off of the Navajo Reservation or off of Off-Reservation land held in trust by the United States for the benefit of the Navajo Nation.

4.18.2 Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, and Navajo Nation Fourth Priority Water may be used on the Navajo Reservation, or off of the Navajo Reservation within the State, but may not be used, leased, exchanged, forborne, or otherwise transferred in any way by the Navajo Nation or the United States acting as trustee for the Navajo Nation, for Use directly or indirectly outside of the State, except for storage as provided in Subparagraphs 4.7.5, 4.8.4, and 4.9.4.

4.18.3 Water Use on Off-Reservation lands taken into trust by the United States for the benefit of the Navajo Nation shall be governed by Subparagraphs 4.12, 4.13, 4.15, and 4.16. The Water referred to in the preceding sentence may be used only on lands held in trust by the United States for the benefit of the Navajo Nation.

4.18.4 Water Use on lands owned in fee by the Navajo Nation shall be governed by Subparagraphs 4.11, 4.12, 4.13, 4.14, 4.15, and 4.16.

4.18.5 The rights of a Navajo Allottee, or the United States acting as trustee for a Navajo Allottee, to use Water described in Subparagraph 4.10.1 on a Navajo Allotment may not be sold, leased, transferred, or in any way used off of the Navajo Allotment, except for Use on the Navajo Reservation pursuant to the Nation Water Code.

4.18.6 Notwithstanding Subparagraphs 4.18.1, 4.18.3, and 7.2, the Navajo Nation may provide water for Municipal Use off of the Navajo Reservation from facilities that are physically connected to facilities on the Navajo Reservation.

## **4.19 REPORTING**

Beginning on March 1 of the first Year following the Year in which the Enforceability Date occurs, and on March 1 of each Year thereafter, the Navajo Nation shall submit a report to ADWR showing: (a) the annual Diversion amount, point of Diversion, and places of Use of Navajo Nation Upper Basin Colorado River Water; (b) the annual Diversion amount, point of Diversion, and places of Use of Navajo Nation Cibola Water; (c) the annual Diversion amount, point of Diversion, and places of Use of Navajo Nation Fourth Priority Water; (d) the location and annual amount of any Off-Reservation storage of Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water; (e) the amount of an Off-Reservation exchange involving Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water; and (f) the location and annual amount of Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water leased Off-Reservation. In order to accurately measure the flow of Water Diverted in the Upper Basin for Use by the Navajo Nation in the State, the Navajo Nation shall install suitable measuring devices at or near each point of Diversion of Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water from the Colorado River's mainstem in the Upper Basin and the San Juan River in the Upper Basin. The Navajo Nation shall notify ADWR in writing of any annual reporting conflicts between Reclamation, the Navajo Nation, or the Upper Colorado River Commission prior to the completion of Reclamation's annual "Colorado River Accounting and Water Use Report for the Lower Basin."

## **5.0 WATER RIGHTS OF THE HOPI TRIBE AND HOPI ALLOTTEES**

The Hopi Tribe, and the United States acting as trustee for the Hopi Tribe, shall have the rights to use Water described in Subparagraphs 5.1 through 5.8, and 5.10 through 5.15 below. The Hopi Allottees, and the United States acting as trustee for Hopi Allottees, shall have the rights to use Water described in Subparagraphs 5.9 and 5.15 below.

### **5.1 GENERALLY APPLICABLE PROVISIONS**

5.1.1 The Water Rights of the Hopi Tribe described in this Paragraph 5.0 may be used for any purpose consistent with this Agreement and the LCR Decree.

5.1.2 The United States shall enter into contracts with the Hopi Tribe, as necessary, for delivery of any of the Water Rights of the Hopi Tribe described in this Paragraph 5.0.

5.1.3. The Hopi Tribe shall provide ADWR with a copy of any proposed contract for the Off-Reservation lease, exchange or storage of Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water at least sixty (60) days prior to execution to allow ADWR to determine whether the contract complies with the terms of this Agreement and the Act. The proposed contract may have financial information redacted.

5.1.4 Water Rights Held in Trust. Except for Effluent, Hopi Tribe Cibola Water, Water Rights pertaining exclusively to Hopi Fee Land, and Water Rights of Hopi Allottees, all Water Rights described in this Paragraph 5.0 shall be held in trust by the United States for the benefit of the Hopi Tribe. Water Rights held in trust by the United States for the benefit of the Hopi Tribe shall not be subject to loss through non-use, forfeiture, or abandonment.

5.1.5 The Hopi Tribe shall have the right to store in a Reservoir on the Hopi Reservation any Water supply that it has a right to use, in accordance with applicable tribal and federal laws and subject to this Agreement.

## **5.2 UNDERGROUND WATER**

The Hopi Tribe, and the United States acting as trustee for the Hopi Tribe, shall have the right to all Underground Water on the Hopi Reservation, subject to the provisions on the Use of the N-Aquifer described in Subparagraph 7.2.

## **5.3 EFFLUENT**

5.3.1 The Hopi Tribe shall have the right to Effluent developed on the Hopi Reservation, which may be used for such purposes as the Hopi Tribe may determine.

5.3.2 Effluent developed by the Hopi Tribe on lands held in trust by the United States for the benefit of the Hopi Tribe may be used on the Hopi Reservation or on lands held in trust by the United States for the benefit of the Hopi Tribe for such purposes as the Hopi Tribe may determine, subject to applicable law.

5.3.3 Effluent developed by the Hopi Tribe on land owned in fee by the Hopi Tribe may be used by the Hopi Tribe for such purposes as the Hopi Tribe may determine subject to State law.

## **5.4 SURFACE WATER**

Subject to the provisions of Subparagraph 7.1, the Hopi Tribe, and the United States acting as trustee for the Hopi Tribe, shall have the right to Divert and Deplete all Surface Water that reaches or flows within the Hopi Reservation.

## **5.5 SPRINGS**

The Hopi Tribe, and the United States acting as trustee for the Hopi Tribe, shall have the right to all springs on the Hopi Reservation, subject to the provisions in Paragraph 7.0 and Subparagraph 5.9.

**5.6** [Intentionally Omitted]

## **5.7 HOPI TRIBE UPPER BASIN COLORADO RIVER WATER**

5.7.1 The State expressly agrees to the allocation of Upper Basin Colorado River Water to the Hopi Tribe as provided in this Subparagraph 5.7 and pursuant to section 6 of the Act.

5.7.2 The Hopi Tribe shall have the right to 2,300 AFY of Upper Basin Colorado River Water. The Hopi Tribe shall have the right to Divert Hopi Tribe Upper Basin Colorado River Water in Arizona only, and to transport Hopi Tribe Upper Basin Colorado River Water for Use only within the State.

5.7.3 The Hopi Tribe shall have the right to Hopi Tribe Upper Basin Colorado River Water for Use in the Upper Basin and the Lower Basin in the State.

5.7.4 The Hopi Tribe may store Hopi Tribe Upper Basin Colorado River Water at underground storage facilities or Groundwater savings facilities located: (a) within the Hopi

Reservation in accordance with Hopi law, or State law if mutually agreed to by the Hopi Tribe and the State; (b) on any other Indian reservation located in the State in accordance with applicable law; and (c) within the State and outside of any Indian reservation in accordance with State law. The Hopi Tribe may assign any long-term storage credits accrued as a result of storage under this Subparagraph in accordance with applicable law. Any Water stored pursuant to tribal law may only be recovered on the Indian reservation where the Water was stored.

5.7.5 The Hopi Tribe shall have the right to use the Colorado River as a conveyance mechanism to convey Hopi Tribe Upper Basin Colorado River Water from the Upper Basin to the Lower Basin for Use within the State.

5.7.6 With the approval of the Secretary, the Hopi Tribe may lease or exchange any portion of Hopi Tribe Upper Basin Colorado River Water for Use in the Upper Basin or Lower Basin in the State. Such leased or exchanged Hopi Tribe Upper Basin Colorado River Water shall be deemed a federal resource held in trust for the benefit of the Hopi Tribe to which the lessee or exchanging party shall acquire only a leasehold or limited interest for the term of the lease or exchange agreement. By leasing or exchanging such Water, the Hopi Tribe shall not forfeit or abandon or lose to non-use its rights to Hopi Tribe Upper Basin Colorado River Water. A lease or exchange agreement under this Subparagraph shall provide that the Water received from the Hopi Tribe shall be used in accordance with applicable law. The non-use of all or any portion of the Hopi Tribe Upper Basin Colorado River Water by a lessee or exchange party shall not result in the loss through non-use, forfeiture or abandonment of any portion of the Hopi Tribe Upper Basin Colorado River Water.

5.7.7 The Hopi Tribe, or any Person who leases or exchanges Hopi Tribe Upper Basin Colorado River Water may transport such Hopi Tribe Upper Basin Colorado River Water through the CAP System in accordance with all laws of the United States and the agreements between the United States and CAWCD governing the use of the CAP System to transport water other than CAP water.

## **5.8 HOPI TRIBE CIBOLA WATER**

5.8.1 The State recommends the allocation of Hopi Tribe Cibola Water to the Hopi Tribe as provided in this Subparagraph 5.8 and as authorized in section 6 of the Act.

5.8.2 Subject to Subparagraph 5.8.3, the Hopi Tribe shall have the right to 4,178 AFY of Fourth Priority Water, 750 AFY of Fifth Priority Water, and 1,000 AFY of Sixth Priority Water. The Hopi Tribe shall have the right to Divert Hopi Tribe Cibola Water in Arizona only, and to transport Hopi Tribe Cibola Water for Use only within the State pursuant to the Hopi Tribe Settlement Cibola Contract.

5.8.3 Any use of Hopi Tribe Cibola Water on land not described in the Hopi Tribe Existing Cibola Contract, or for a use not described in the Hopi Tribe Existing Cibola Contract, shall be subject to a consumptive use calculation by the Secretary utilizing consumptive use methodologies employed by the Secretary for calculating consumptive use of Colorado River Water at land described in the Hopi Tribe Existing Cibola Contract and other comparable locations on the mainstem in the Lower Basin. Such consumptive use volume shall be established by the Secretary at the time of a change in place of use or change in purpose of use of Hopi Tribe Cibola Water. Such consumptive use volume as

established by the Secretary shall remain in effect for as long as such change in place of use or change in purpose of use of Hopi Tribe Cibola Water continues. Notwithstanding (a) any prior use of Hopi Tribe Cibola Water on land not described in the Hopi Tribe Existing Cibola Contract, (b) any prior use not described in the Hopi Tribe Existing Cibola Contract, (c) any prior consumptive use calculation by the Secretary, or (d) any history of consumptive use on land not described in the Hopi Tribe Existing Cibola Contract, or for a use not described in the Hopi Tribe Existing Cibola Contract, the Hopi Tribe shall have the right to Divert and consumptively use up to 4,178 AFY of Fourth Priority Water, 750 AFY of Fifth Priority Water, and 1,000 AFY of Sixth Priority Water on land described in the Hopi Tribe Existing Cibola Contract for the use described in the Hopi Tribe Existing Cibola Contract.

5.8.4 The Hopi Tribe may store Hopi Tribe Cibola Water at underground storage facilities or Groundwater savings facilities located: (a) within the Hopi Reservation in accordance with Hopi law, or State law if mutually agreed to by the Hopi Tribe and the State; (b) on any other Indian reservation located in the State in accordance with applicable law; and (c) within the State and outside of any Indian reservation in accordance with State law. The Hopi Tribe may assign any long-term storage credits accrued as a result of storage under this Subparagraph in accordance with applicable law. Any such Hopi Tribe Cibola Water stored pursuant to tribal law may only be recovered on the Indian reservation where such Hopi Tribe Cibola Water was stored.

5.8.5 With approval of the Secretary, the Hopi Tribe may lease or exchange any portion of Hopi Tribe Cibola Water for Use in the State, to which the lessee or exchange party shall acquire only a leasehold or limited interest for the term of the lease or exchange

agreement. By leasing or exchanging Hopi Tribe Cibola Water, the Hopi Tribe shall not forfeit, abandon, or lose to non-use its rights to Hopi Tribe Cibola Water. The non-use of all or any portion of the Hopi Tribe Cibola Water by a lessee or exchange party shall not result in the loss through non-use, forfeiture, or abandonment of any portion of the Hopi Tribe Cibola Water. A lease or exchange agreement under this Subparagraph shall provide that such Hopi Tribe Cibola Water shall be used in accordance with applicable law.

5.8.6 The Hopi Tribe, or any Person who leases or exchanges Hopi Tribe Cibola Water, may transport such Hopi Tribe Cibola Water through the CAP System in accordance with all laws of the United States and the agreements between the United States and CAWCD governing the use of the CAP System to transport water other than CAP water.

## **5.9 HOPI ALLOTTEES**

Subject to the terms of this Agreement, a Hopi Allottee, and the United States acting as trustee for a Hopi Allottee, shall have all Water Rights and uses of Water that are described in the Abstracts attached as Exhibit 5.9. Such rights and uses shall not be subject to objection, dispute, or challenge by the Parties, in the LCR Adjudication or in any other judicial or administrative proceeding, and, after incorporation in the LCR Decree, shall be binding on all parties to the LCR Adjudication. All Water Rights for each Hopi Allotment shall be held in trust by the United States for the benefit of Hopi Allottees for such Hopi Allotment, and shall not be subject to loss through non-use, forfeiture, or abandonment. The Hopi Tribe Water Code shall provide Hopi Allottees a process to enforce the Water Rights abstracted in Exhibit 5.9 against the Hopi Tribe.

**5.10 WATER RIGHTS AND USES OF WATER FOR LANDS OWNED IN FEE BY THE HOPI TRIBE, OR HELD IN TRUST BY THE UNITED STATES FOR THE BENEFIT OF THE HOPI TRIBE, AS OF THE EFFECTIVE DATE—LCR WATERSHED**

5.10.1 As of the Effective Date: (1) the Hopi Tribe owns lands in fee that are located outside the exterior boundaries of the Hopi Reservation within the LCR Watershed, including the 26 Bar Ranch, DoBell Ranch, Aja Ranch fee lands, Homolovi fee lands, Hart Ranch fee lands, and Clear Creek Ranch fee lands as set forth in Exhibits 5.10.1A, 5.10.1B, 5.10.1C, 5.10.1D, 5.10.1E, and 5.10.1F; and (2) the United States holds lands in trust for the benefit of the Hopi Tribe that are located outside the exterior boundaries of the Hopi Reservation within the LCR watershed, including the Hart Ranch, Twin Arrows trust land, Drye Ranch, Aja Ranch trust lands, Clear Creek Ranch trust lands, and the Hopi Industrial Park as set forth in Exhibits 5.10.1G, 5.10.1H, 5.10.1I, 5.10.1J, 5.10.1K, and 5.10.1L. Subject to the terms of this Agreement, the Hopi Tribe shall continue to have all Water Rights and Uses of Water existing under State law as of the Effective Date that are appurtenant to or associated with such fee lands, as described in the Abstracts attached as Exhibits 5.10.1AA, 5.10.1BB, 5.10.1CC, 5.10.1DD, 5.10.1EE, and 5.10.1FF. Subject to the terms of this Agreement, the Hopi Tribe, and the United States acting as trustee for the Hopi Tribe, shall continue to have all Water Rights and Uses of Water existing as of the Effective Date that are described in the Abstracts attached as Exhibits 5.10.1GG 5.10.1HH, 5.10.1II, 5.10.1JJ, 5.10.1KK, and 5.10.1LL. Such Water Rights and Uses of Water shall not be subject to objection, dispute, or challenge by the Parties, in the LCR Adjudication or any other judicial or administrative proceeding. After incorporation in the LCR Decree, such Water Rights and Uses shall be binding on all parties to the LCR Adjudication. Exhibits

5.10.1A – 5.10.1L and Exhibits 5.10.1AA – 5.10.1LL may be supplemented upon application to the LCR Adjudication Court before the Enforceability Date, to correct errors and omissions.

5.10.2 In addition to the Water Rights and Uses of Water for the lands described in Subparagraph 5.10.1, after the Effective Date but before the Enforceability Date, the Hopi Tribe, or the United States acting as trustee for the Hopi Tribe in consultation with and upon the agreement of the Hopi Tribe, may obtain new Water Rights or initiate new Uses of Water for such lands, including changing the manner or place of Use of Water Rights:

(a) for so long as the lands are held in fee status, as permitted by State law and this Agreement;

(b) for lands that are held in trust as of the Effective Date, other than the Hopi Industrial Park, in accordance with Public Law No. 104-301, 110 Stat. 3649, and this Agreement; and

(c) for Hopi Industrial Park, in accordance with applicable law and this Agreement.

The Hopi Tribe shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated after the Effective Date but before the Enforceability Date for such fee lands. The United States shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated after the Effective Date but before the Enforceability Date for such trust lands. All such Abstracts must be completed on or before the Enforceability Date. The Hopi Tribe or the United States, whichever prepared the Abstract, shall promptly move to supplement

the LCR Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

5.10.3 After the Enforceability Date, the Hopi Tribe, or the United States acting as trustee for the Hopi Tribe in consultation with and upon the agreement of the Hopi Tribe, may obtain new Water Rights or initiate new Uses of Water for the lands described in Subparagraph 5.10.1, including changing the manner or place of Use of Water Rights:

(a) for so long as such lands are in fee status, as permitted by State law, and this Agreement;

(b) for lands that are held in trust as of the Effective Date, other than the Hopi Industrial Park, in accordance with Public Law No. 104-301, 110 Stat. 3649, and this Agreement; and

(c) for Hopi Industrial Park, in accordance with applicable law and this Agreement.

The Hopi Tribe shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated after the Enforceability Date for such fee lands. The United States shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated after the Enforceability Date for such trust lands. The Hopi Tribe or the United States, whichever prepared the Abstract, shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

5.10.4 If the Abstracts described in Subparagraphs 5.10.1, 5.10.2 and 5.10.3 are agreed to by all of the Parties before being submitted to the LCR Adjudication Court for approval (which agreement shall not be unreasonably withheld, conditioned, or delayed), the Water Rights and Uses of Water described in such Abstracts shall not be subject to objection, dispute, or challenge by the Parties in the LCR Adjudication or any other judicial or administrative proceeding. If the Abstracts described in Subparagraphs 5.10.1, 5.10.2, and 5.10.3 are not agreed to by all of the Parties before their submission to the LCR Adjudication Court for approval, the Parties who are not in agreement may object to the incorporation of all or portions of such Abstracts in the LCR Decree. After the incorporation of the Abstracts described in Subparagraphs 5.10.1, 5.10.2, and 5.10.3 in the LCR Decree, such Abstracts shall be binding on all parties to the LCR Adjudication.

**5.11 WATER RIGHTS AND USES OF WATER FOR LANDS ACQUIRED BY THE HOPI TRIBE IN FEE, OR TAKEN INTO TRUST BY THE UNITED STATES FOR THE BENEFIT OF THE HOPI TRIBE, AFTER THE EFFECTIVE DATE BUT BEFORE THE ENFORCEABILITY DATE—  
LCR WATERSHED**

5.11.1 Lands within the LCR Watershed acquired by the Hopi Tribe in fee, or taken into trust by the United States for the benefit of the Hopi Tribe pursuant to Public Law No. 104-301, 110 Stat. 3649, or taken into trust by the United States for the benefit of the Hopi Tribe other than pursuant to Public Law No. 104-301, 110 Stat. 3649, after the Effective Date but before the Enforceability Date shall be subject to any applicable limitations imposed by this Agreement and are entitled to any applicable benefits provided by this Agreement, including Water Rights and Uses of Water appurtenant to or associated with the lands that were held by the grantor or transferor of the lands and included in the transaction. The Hopi Tribe shall complete Abstracts for all Water Rights and Uses of Water

appurtenant to or associated with such fee lands acquired by the Hopi Tribe, unless previously decreed by the LCR Adjudication Court. The United States shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such trust lands, unless previously decreed by the LCR Adjudication Court. All such Abstracts must be completed on or before the Enforceability Date. The Hopi Tribe and the United States, whichever completed the Abstract, shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional Water Rights and Uses of Water.

5.11.2 The Hopi Tribe, or the United States acting as trustee for the Hopi Tribe in consultation with and upon the agreement of the Hopi Tribe, may obtain new Water Rights and initiate new Uses of Water for the lands described in Subparagraph 5.11.1, including changing the manner or place of Use of Water Rights, after the date of their acquisition but before the Enforceability Date as follows: (a) for lands acquired by the Hopi Tribe in fee, as permitted by State law and this Agreement; (b) for lands taken into trust pursuant to Public Law No. 104-301, 110 Stat. 3649, in accordance with this Agreement and Public Law No. 104-301, 110 Stat. 3649; and (c) for lands taken into trust by the United States for the benefit of the Hopi Tribe other than pursuant to Public Law No. 104-301, 110 Stat. 3649, in accordance with applicable law and this Agreement. The Hopi Tribe shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands. The United States shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such trust lands. All such Abstracts must be completed on or before the Enforceability Date. The Hopi Tribe or the United States, whichever completed the

Abstract, shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

5.11.3 The Hopi Tribe, or the United States acting as trustee for the Hopi Tribe in consultation with and upon the agreement of the Hopi Tribe, may obtain new Water Rights or initiate new Uses of Water, including changing the manner or place of Use of Water Rights, after the Enforceability Date for the lands described in Subparagraph 5.11.1 as follows: (a) for lands acquired by the Hopi Tribe in fee, as permitted by State law and this Agreement; (b) for lands taken into trust pursuant to Public Law No. 104-301, 110 Stat. 3649, in accordance with this Agreement and Public Law No. 104-301, 110 Stat. 3649; and (c) for lands taken into trust by the United States for the benefit of the Hopi Tribe other than pursuant to Public Law No. 104-301, 110 Stat. 3649, in accordance with applicable law and this Agreement. The Hopi Tribe shall promptly complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands. The United States shall promptly complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such trust lands. The Hopi Tribe or the United States, whichever completed the Abstract, shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

5.11.4 If the Abstracts described in Subparagraphs 5.11.1, 5.11.2 and 5.11.3 are agreed to by all of the Parties before being submitted to the LCR Adjudication Court for approval (which agreement shall not be unreasonably withheld, conditioned, or delayed), the Water Rights and Uses of Water described in such Abstracts shall not be subject to objection, dispute, or challenge by the Parties in the LCR Adjudication or any other judicial

or administrative proceeding. If the Abstracts described in Subparagraphs 5.11.1, 5.11.2 and 5.11.3 are not agreed to by all of the Parties before being submitted to the LCR Adjudication Court for approval, the Parties who are not in agreement may object to the incorporation of all or portions of such Abstracts in the LCR Decree. After the incorporation of the Abstracts described in Subparagraphs 5.11.1, 5.11.2, and 5.11.3 in the LCR Decree, such Abstracts shall be binding on all parties to the LCR Adjudication.

**5.12 WATER RIGHTS AND USES OF WATER FOR LANDS ACQUIRED BY THE HOPI TRIBE IN FEE, OR TAKEN INTO TRUST BY THE UNITED STATES FOR THE BENEFIT OF THE HOPI TRIBE, AFTER THE ENFORCEABILITY DATE—LCR WATERSHED**

5.12.1 Lands within the LCR Watershed acquired by the Hopi Tribe in fee, or taken into trust by the United States for the benefit of the Hopi Tribe pursuant to Public Law No. 104-301, 110 Stat. 3649, or taken into trust by the United States for the benefit of the Hopi Tribe other than pursuant to Public Law No. 104-301, 110 Stat. 3649, after the Enforceability Date shall be subject to any applicable limitations imposed by this Agreement, and are entitled to any applicable benefits provided by this Agreement, including Water Rights and Uses of Water appurtenant to or associated with the lands that were held by the grantor or transferor of the lands and included in the transaction. The Hopi Tribe shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such fee lands, unless previously decreed by the LCR Adjudication Court. The United States shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such trust lands, unless previously decreed by the LCR Adjudication Court. The Hopi Tribe or the United States, whichever completed the Abstract,

shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional Water Rights and Uses of Water.

5.12.2 The Hopi Tribe, or the United States acting as trustee for the Hopi Tribe in consultation with and upon the agreement of the Hopi Tribe, may obtain new Water Rights or initiate new Uses of Water for the lands described in Subparagraph 5.12.1, including changing the manner or place of Use of Water Rights, after the Enforceability Date, as follows: (a) for lands acquired by the Hopi Tribe in fee, as permitted by State law and this Agreement; (b) for lands taken into trust pursuant to Public Law No. 104-301, 110 Stat. 3649, in accordance with this Agreement and Public Law No. 104-301, 110 Stat. 3649; and (c) for lands taken into trust by the United States for the benefit of the Hopi Tribe other than pursuant to Public Law No. 104-301, 110 Stat. 3649, in accordance with applicable law and this Agreement. The Hopi Tribe shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands. The United States shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such trust lands. The Hopi Tribe or the United States, whichever completed the Abstract, shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

5.12.3 If the Abstracts described in Subparagraphs 5.12.1 and 5.12.2 are agreed to by all of the Parties before being submitted by the Hopi Tribe to the LCR Adjudication Court for approval (which agreement shall not be unreasonably withheld, conditioned, or delayed), the Water Rights and Uses of Water described in such Abstracts shall not be subject to objection, dispute, or challenge by the Parties in the LCR Adjudication or any

other judicial or administrative proceeding. If the Abstracts described in Subparagraphs 5.12.1 and 5.12.2 are not agreed to by all of the Parties before being submitted to the LCR Adjudication Court for approval, the Parties who are not in agreement may object to the incorporation of all or portions of such Abstracts in the LCR Decree. After the incorporation of the Abstracts described in Subparagraphs 5.12.1 and 5.12.2 in the LCR Decree, such Abstracts shall be binding on all parties to the LCR Adjudication.

### **5.13 NEW SURFACE WATER USES**

Subject to Paragraph 8.0, and conditioned upon compliance with the Abstract requirements of Subparagraphs 5.10, 5.11, and 5.12 and incorporation of the Abstracts in the LCR Decree, the Hopi Tribe, and the United States acting as trustee for the Hopi Tribe in consultation with and upon the agreement of the Hopi Tribe, shall have the right to make any further Use of Surface Water on lands that are held in trust as set forth in Pub. L. No. 104-301, 110 Stat. 3649 which was unappropriated on the date that each parcel was taken into trust pursuant to Pub. L. No. 104-301, 110 Stat. 3649. The priority date for the right described in the immediately preceding sentence shall be the date the lands are taken into trust.

### **5.14 AGREEMENTS NOT TO OBJECT, DISPUTE OR CHALLENGE**

5.14.1 Subject to the terms of Exhibit 9.10, the Parties shall not object to, dispute, or challenge, in the LCR Adjudication or any other judicial or administrative proceeding, the withdrawal or Use of Underground Water by the Hopi Tribe, or the United States acting as trustee for the Hopi Tribe, from any Off-Reservation Well located on lands owned by the

Hopi Tribe in fee or held in trust by the United States for the benefit of the Hopi Tribe, or the drilling or replacement of any Off-Reservation Well by the Hopi Tribe, or the United States acting as trustee for the Hopi Tribe, located on lands owned by the Hopi Tribe in fee or lands held in trust by the United States for the benefit of the Hopi Tribe. The Parties also shall not object to, dispute, or challenge, in the LCR Adjudication or any other judicial or administrative proceeding, the withdrawal or Use of Underground Water by the Hopi Tribe in a manner described in the Abstracts attached as Exhibits 5.10.1AA, et seq.

5.14.2 Except as provided in Paragraph 7.0, the Parties shall not object to, dispute, or challenge the withdrawal or Use of Underground Water from any Well located on the Hopi Reservation, or the drilling or replacement of any Well for the withdrawal and Use of Underground Water on the Hopi Reservation in the LCR Adjudication or any other judicial or administrative proceeding.

**5.15 PLACE OF USE FOR WATER RIGHTS AND USES OF WATER SUBJECT TO SETTLEMENT AGREEMENT; OTHER PROVISIONS**

5.15.1 The rights of the Hopi Tribe, or the United States acting as trustee for the Hopi Tribe, to the Water described in Subparagraphs 5.2, 5.4, and 5.5 may be used anywhere on the Hopi Reservation, but may not be sold, leased, transferred or in any way used off of the Hopi Reservation or off of Off-Reservation land held in trust by the United States for the benefit of the Hopi Tribe.

5.15.2 Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water may be used on or off of the Hopi Reservation within the State, but may not be used, leased, exchanged, forborne, or otherwise transferred in any way by the Hopi Tribe or the

United States acting as trustee for the Hopi Tribe for Use directly or indirectly outside of the State.

5.15.3 Water Use on Off-Reservation lands held in trust by the United States for the benefit of the Hopi Tribe shall be governed by Subparagraphs 5.10, 5.11, 5.12, and 5.13. The Water referred to in the preceding sentence may be used only on lands held in trust by the United States for the benefit of the Hopi Tribe.

5.15.4 Water Use on lands owned in fee by the Hopi Tribe shall be governed by Subparagraphs 5.10, 5.11, and 5.12.

5.15.5 The rights of a Hopi Allottee, or the United States acting as trustee for a Hopi Allottee, to use Water described in Subparagraph 5.9 on a Hopi Allotment may not be sold, leased, transferred, or in any way used off of the Hopi Allotment.

5.15.6 Notwithstanding Subparagraph 5.15.1, 5.15.3, and 7.2, the Hopi Tribe may provide water for Municipal Use off of the Hopi Reservation from facilities owned by the Hopi Tribe or its entities or enterprises which are physically connected to their facilities on the Hopi Reservation.

5.15.7 The Hopi Tribe may subordinate its senior priority under the Norviel Decree to junior users.

## **5.16 REPORTING**

Beginning on March 1 of the first Year following the Year in which the Enforceability Date occurs, and on March 1 of each Year thereafter, the Hopi Tribe shall submit a report to ADWR showing: (a) the annual Diversion amount, point of Diversion, and places of Use

of Hopi Tribe Upper Basin Colorado River Water; (b) the annual Diversion amount, point of Diversion, and places of Use of Hopi Tribe Cibola Water; (c) the location and annual amount of any Off-Reservation storage of Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water; (d) the amount of an Off-Reservation exchange involving Hopi Tribe Upper Basin Colorado River Water or Hopi Tribe Cibola Water; and (e) the location and annual amount of Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water leased Off-Reservation. In order to accurately measure the flow of Water Diverted in the Upper Basin for Use by the Hopi Tribe in the State, the Hopi Tribe shall install suitable measuring devices at or near each point of Diversion of Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water from the Colorado River's mainstem in the Upper Basin. The Hopi Tribe shall notify ADWR in writing of any annual reporting conflicts between Reclamation, the Hopi Tribe, or the Upper Colorado River Commission prior to the completion of Reclamation's annual "Colorado River Accounting and Water Use Report for the Lower Basin."

## **6.0 SAN JUAN SOUTHERN PAIUTE TRIBE LAND AND WATER RIGHTS**

### **6.1 THE SAN JUAN SOUTHERN PAIUTE RESERVATION**

6.1.1 There is hereby approved, as set forth in section 19 of the Act, the Treaty and the Treaty Addendum.

6.1.2 There is hereby proclaimed, as set forth in section 19 of the Act, all right, title and interest, including Water Rights, to the approximately 5,400 acres of land within the Navajo Indian Reservation that are described in the Treaty as the San Juan Paiute Northern

Area and the San Juan Paiute Southern Area, as the San Juan Southern Paiute Reservation and such lands shall be held by the United States in trust as a reservation for the exclusive benefit of the San Juan Southern Paiute Tribe, subject to the rights of access under the Treaty.

6.1.3 The Treaty and the Treaty Addendum shall be approved on the Enactment Date.

6.1.4 Once the Treaty and Treaty Addendum are approved, no subsequent action or inaction related to this Agreement shall alter the effectiveness of the Treaty or the Treaty Addendum.

6.1.5 Subparagraphs 6.2 through 6.6 of this Agreement satisfy and do not conflict with Article XV of the Treaty concerning Water Rights.

6.1.6 Section 9 of Public Law 93–531 (88 Stat. 1716, formerly codified at 25 U.S.C. 640d–8) shall be repealed in the Act.

6.1.7 In the course of implementing the Treaty, the United States shall provide advance notice to the Tribes of any ground disturbance that may disturb or damage archaeological or cultural sites. The Tribes and the United States shall work together to avoid or mitigate damage to those sites.

## **6.2 SAN JUAN SOUTHERN PAIUTE SOUTHERN AREA WATER RIGHTS**

6.2.1 The San Juan Southern Paiute Tribe, and the United States acting as trustee for the San Juan Southern Paiute Tribe, shall have the Water Rights described in this

Subparagraph 6.2 for Use on the San Juan Southern Paiute Southern Area. The Water Rights described in this Subparagraph 6.2 may be used for any purpose consistent with this Agreement and the LCR Decree.

6.2.2 Except for Effluent, the Water Rights described in this Subparagraph 6.2 shall be held in trust by the United States for the benefit of the San Juan Southern Paiute Tribe. Water Rights held in trust by the United States for the benefit of the San Juan Southern Paiute Tribe shall not be subject to loss through non-use, forfeiture, or abandonment.

6.2.3 The San Juan Southern Paiute Tribe, and the United States acting as trustee for the San Juan Southern Paiute Tribe, shall have the right to all Underground Water on the San Juan Southern Paiute Southern Area.

6.2.4 The San Juan Southern Paiute Tribe, and the United States acting as trustee for the San Juan Southern Paiute Tribe, shall have the right to Divert and Deplete all Surface Water that reaches or flows within the San Juan Southern Paiute Southern Area.

6.2.5 Effluent.

6.2.5.1 The San Juan Southern Paiute Tribe shall have the right to Effluent developed on the San Juan Southern Paiute Southern Area, which may be used for such purposes as the San Juan Southern Paiute Tribe may determine.

6.2.5.2 Effluent developed by the San Juan Southern Paiute Tribe on lands held in trust by the United States for the benefit of the San Juan Southern Paiute Tribe, but located outside of the San Juan Southern Paiute Southern Area, may be

used on the San Juan Southern Paiute Southern Area or on lands held in trust by the United States for the benefit of the San Juan Southern Paiute Tribe for such purposes as the San Juan Southern Paiute Tribe may determine, subject to applicable law.

6.2.5.3 Effluent developed by the San Juan Southern Paiute Tribe on land owned in fee by the San Juan Southern Paiute Tribe may be used by the San Juan Southern Paiute Tribe for such purposes as the San Juan Southern Paiute Tribe may determine subject to State law.

6.2.6 The San Juan Southern Paiute Tribe, and the United States acting as trustee for the San Juan Southern Paiute Tribe, shall have the right to all springs on the San Juan Southern Paiute Southern Area.

### **6.3 SAN JUAN SOUTHERN PAIUTE WATER DELIVERY**

6.3.1 Pursuant to a water services agreement between the San Juan Southern Paiute Tribe and NTUA, the Navajo Nation shall deliver Water to the San Juan Southern Paiute Southern Area in an amount determined by the San Juan Southern Paiute Tribe but not to exceed 350 AFY. The water services agreement shall include the following provisions:

6.3.1.1 The San Juan Southern Paiute Tribe members presently using the community water system serviced by the NTUA, and their heirs and assigns, may, at their option, remain connected to that system and shall be served by it on a nondiscriminatory basis from the Water described in Subparagraph 6.3.1.

6.3.1.2 The Navajo Nation shall deliver on a nondiscriminatory basis, through NTUA, the Water described in Subparagraph 6.3.1 to additional San Juan Southern Paiute Tribe members who connect to the community water system. Connection to the community water system shall not be denied.

6.3.1.3 All rates, terms, and surcharges for retail water service shall be applied the same to all NTUA individual customers regardless of tribal affiliation.

6.3.1.4 At the San Juan Southern Paiute Tribe's option, the Navajo Nation, through NTUA, shall deliver the Water described in Subparagraph 6.3.1 to the San Juan Southern Paiute Southern Area pursuant to an amendment to the water services agreement, described below, providing for bulk water delivery, which may include delivery through the iiná bá – paa tuwaqat'si pipeline.

6.3.1.4.1 Upon written notice by the San Juan Southern Paiute Tribe calling for bulk delivery, the Navajo Nation shall cause NTUA to enter into the amendment.

6.3.1.4.2 The amendment shall specify the quantity of bulk water to be delivered and ensure bulk water delivery is available within twelve (12) months of receiving notice, or at a later time as agreed upon in writing by the San Juan Southern Paiute Tribe and the Navajo Nation.

6.3.1.4.3 The rate for such bulk water service will be determined by an independent cost of service and rate design expert, to be selected by mutual agreement of the San Juan Southern Paiute Tribe and the Navajo Nation. If an

expert cannot be agreed upon a mediator shall be retained for the sole purpose of selecting an expert from a list of candidates identified by the San Juan Southern Paiute Tribe and the Navajo Nation.

6.3.1.4.4 The San Juan Southern Paiute Tribe shall be responsible for the cost of constructing and maintaining facilities necessary to bring water from any points of delivery to the San Juan Southern Paiute Tribe's facilities, as well as for the cost of constructing and maintaining the San Juan Southern Paiute Tribe's facilities to accept bulk water deliveries.

6.3.1.4.5 Terms and conditions of the amendment to the water services agreement providing for bulk water delivery shall contain industry standard terms.

6.3.2 The San Juan Southern Paiute Tribe shall own any water infrastructure (wells, treatment, distribution pipelines, etc.) it funds or constructs on the San Juan Southern Paiute Reservation.

6.3.3 The San Juan Southern Paiute Tribe will have the option to acquire any portion of NTUA's facilities which may be located on the San Juan Southern Paiute Reservation that are used exclusively to serve the San Juan Southern Paiute Tribe. The portion of the facilities used exclusively to serve the San Juan Southern Paiute Tribe will be available for transfer at a cost minus depreciation price when the San Juan Southern Paiute Tribe begins operation of its water utility.

6.3.4 NTUA will have the right to retain its existing facilities that cross through the San Juan Southern Paiute Reservation to serve other NTUA customers.

**6.4 WATER RIGHTS AND USES OF WATER FOR LANDS OWNED IN FEE BY THE SAN JUAN SOUTHERN PAIUTE TRIBE AS OF THE EFFECTIVE DATE—LCR WATERSHED**

6.4.1 As of the Effective Date, the San Juan Southern Paiute Tribe owns lands in fee that are located outside the exterior boundaries of the San Juan Southern Paiute Reservation within the LCR Watershed, as set forth in Exhibits 6.4.1A and 6.4.1B. Subject to the terms of this Agreement, the San Juan Southern Paiute Tribe shall continue to have all Water Rights and Uses of Water existing under State law as of the Effective Date that are appurtenant to or associated with such fee lands, as described in the Abstracts attached as Exhibits 6.4.1AA and 6.4.1BB. Such Water Rights and Uses of Water shall not be subject to objection, dispute, or challenge by the Parties, in the LCR Adjudication or in any other judicial or administrative proceeding. After incorporation in the LCR Decree, such Water Rights and Uses of Water shall be binding on all parties to the LCR Adjudication. Exhibits 6.4.1A and 6.4.1B, and Exhibits 6.4.1AA and 6.4.1BB, may be supplemented upon application to the LCR Adjudication Court, before the Enforceability Date, to correct errors and omissions.

6.4.2 In addition to the Water Rights and Uses of Water for the lands described in Subparagraph 6.4.1, after the Effective Date but before the Enforceability Date, the San Juan Southern Paiute Tribe may obtain new Water Rights or initiate new Uses of Water for such fee lands, including changing the manner or place of Use of Water Rights, as permitted by State law and this Agreement. The San Juan Southern Paiute Tribe shall

complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands after the Effective Date but before the Enforceability Date. All such Abstracts must be completed on or before the Enforceability Date. The San Juan Southern Paiute Tribe shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

6.4.3 After the Enforceability Date, the San Juan Southern Paiute Tribe may obtain new Water Rights or initiate new Uses of Water for the lands described in Subparagraph 6.4.1, including changing the manner or place of Use of Water Rights, as permitted by State law and this Agreement. The San Juan Southern Paiute Tribe shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands by the San Juan Southern Paiute Tribe after the Enforceability Date and shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

6.4.4 If the Abstracts described in Subparagraphs 6.4.1, 6.4.2 and 6.4.3 are agreed to by all of the Parties before being submitted to the LCR Adjudication Court for approval (which agreement shall not be unreasonably withheld, conditioned, or delayed), the Water Rights and Uses of Water described in such Abstracts shall not be subject to objection, dispute, or challenge by the Parties, in the LCR Adjudication or any other judicial or administrative proceeding. If the Abstracts described in Subparagraphs 6.4.1, 6.4.2 and 6.4.3 are not agreed to by all of the Parties before their submission to the LCR Adjudication Court for approval, the Parties who are not in agreement may object to the incorporation of all or portions of such Abstracts in the LCR Decree. After the incorporation of the Abstracts

described in Subparagraphs 6.4.1, 6.4.2 and 6.4.3 in the LCR Decree, such Abstracts shall be binding on all parties to the LCR Adjudication.

**6.5 WATER RIGHTS AND USES OF WATER FOR LANDS ACQUIRED BY THE SAN JUAN SOUTHERN PAIUTE TRIBE IN FEE, OR TAKEN INTO TRUST BY THE UNITED STATES FOR THE BENEFIT OF THE SAN JUAN SOUTHERN PAIUTE TRIBE, AFTER THE EFFECTIVE DATE BUT BEFORE THE ENFORCEABILITY DATE —LCR WATERSHED**

6.5.1 Lands within the LCR Watershed acquired by the San Juan Southern Paiute Tribe in fee, or taken into trust by the United States for the benefit of the San Juan Southern Paiute Tribe, after the Effective Date but before the Enforceability Date shall be subject to any applicable limitations imposed by this Agreement and are entitled to any applicable benefits provided by this Agreement, including Water Rights and Uses of Water appurtenant to or associated with the lands that were held by the grantor or transferor of the lands and included in the transaction. The San Juan Southern Paiute Tribe shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such fee lands acquired by the San Juan Southern Paiute Tribe, unless previously decreed by the LCR Adjudication Court. The United States shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such trust lands, unless previously decreed by the LCR Adjudication Court. All such Abstracts must be completed on or before the Enforceability Date. The San Juan Southern Paiute Tribe, or the United States, whichever completed the Abstract, shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional Water Rights and Uses of Water.

6.5.2 The San Juan Southern Paiute Tribe, or the United States acting as trustee for the San Juan Southern Paiute Tribe in consultation with and upon the agreement of the San

Juan Southern Paiute Tribe, may obtain new Water Rights or initiate new Uses of Water for the lands described in Subparagraph 6.5.1, including changing the manner or place of Use of Water Rights, after the date of their acquisition but before the Enforceability Date as follows: (a) for lands acquired by the San Juan Southern Paiute Tribe in fee, as permitted by State law and this Agreement; and (b) for lands taken into trust by the United States for the benefit of the San Juan Southern Paiute Tribe, in accordance with applicable law and this Agreement. The San Juan Southern Paiute Tribe shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands. The United States shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such trust lands. All such Abstracts must be completed on or before the Enforceability Date. The San Juan Southern Paiute Tribe or the United States, whichever completed the Abstract, shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

6.5.3 The San Juan Southern Paiute Tribe, or the United States acting as trustee for the San Juan Southern Paiute Tribe in consultation with and upon the agreement of the San Juan Southern Paiute Tribe, may obtain new Water Rights or initiate new Uses of Water, including changing the manner or place of Use of Water Rights, after the Enforceability Date for the lands described in Subparagraph 6.5.1 as follows: (a) for lands acquired by the San Juan Southern Paiute Tribe in fee, as permitted by State law and this Agreement; and (b) for lands taken into trust by the United States for the benefit of the San Juan Southern Paiute Tribe, in accordance with applicable law and this Agreement. The San Juan Southern Paiute Tribe shall promptly complete Abstracts for all Water Rights and Uses of

Water obtained or initiated for such fee lands. The United States shall promptly complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such trust lands. The San Juan Southern Paiute Tribe or the United States, whichever completed the Abstract, shall promptly move to supplement the LCR decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

6.5.4 If the Abstracts described in Subparagraphs 6.5.1, 6.5.2 and 6.5.3 are agreed to by all of the Parties before being submitted to the LCR Adjudication Court for approval (which agreement shall not be unreasonably withheld, conditioned or delayed), the Water Rights and Uses of Water described in such Abstracts shall not be subject to objection, dispute, or challenge by the Parties, in the LCR Adjudication or any other judicial or administrative proceeding. If the Abstracts described in Subparagraphs 6.5.1, 6.5.2 and 6.5.3 are not agreed to by all of the Parties before being submitted to the LCR Adjudication Court for approval, the Parties who are not in agreement may object to the incorporation of all or portions of such Abstracts in the LCR Decree. After the incorporation of the Abstracts described in Subparagraphs 6.5.1, 6.5.2 and 6.5.3 in the LCR Decree, such Abstracts shall be binding on all parties to the LCR Adjudication.

**6.6 WATER RIGHTS AND USES OF WATER FOR LANDS ACQUIRED BY THE SAN JUAN SOUTHERN PAIUTE TRIBE IN FEE, OR TAKEN INTO TRUST BY THE UNITED STATES FOR THE BENEFIT OF THE SAN JUAN SOUTHERN PAIUTE TRIBE, AFTER THE ENFORCEABILITY DATE—LCR WATERSHED**

6.6.1 Lands within the LCR Watershed acquired by the San Juan Southern Paiute Tribe in fee, or taken into trust by the United States for the benefit of the San Juan Southern Paiute Tribe, after the Enforceability Date shall be subject to any applicable limitations

imposed by this Agreement, and are entitled to any applicable benefits provided by this Agreement, including Water Rights and Uses of Water appurtenant to or associated with the lands that were held by the grantor or transferor of the lands and included in the transaction. The San Juan Southern Paiute Tribe shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such fee lands, unless previously decreed by the LCR Adjudication Court. The United States shall complete Abstracts for all Water Rights and Uses of Water appurtenant to or associated with such trust lands, unless previously decreed by the LCR Adjudication Court. The San Juan Southern Paiute Tribe, or the United States, whichever completed the Abstract, shall promptly move to supplement the LCR Decree to include the Abstracts for such additional Water Rights and Uses of Water.

6.6.2 San Juan Southern Paiute Tribe, or the United States acting as trustee for the San Juan Southern Paiute Tribe in consultation with and upon the agreement of the San Juan Southern Paiute Tribe, may obtain new Water Rights or initiate new Uses of Water for the lands described in Subparagraph 6.6.1, including changing the manner or place of Use of Water Rights, after the Enforceability Date as follows: (a) for lands acquired by the San Juan Southern Paiute Tribe in fee, as permitted by State law and this Agreement; and (b) for lands taken into trust by the United States for the benefit of the San Juan Southern Paiute Tribe, in accordance with applicable law and this Agreement. The San Juan Southern Paiute Tribe shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such fee lands. The United States shall complete Abstracts for all Water Rights and Uses of Water obtained or initiated for such trust lands. The San Juan Southern Paiute Tribe

or the United States, whichever completed the Abstract, shall promptly move to supplement the LCR Decree to include the Abstracts for any such additional or modified Water Rights and Uses of Water.

6.6.3 If the Abstracts described in Subparagraphs 6.6.1 and 6.6.2 are agreed to by all of the Parties before being submitted by the San Juan Southern Paiute Tribe to the LCR Adjudication Court for approval (which agreement shall not be unreasonably withheld, conditioned, or delayed), the Water Rights and Uses of Water described in such Abstracts shall not be subject to objection, dispute, or challenge by the Parties in the LCR Adjudication or any other judicial or administrative proceeding. If the Abstracts described in Subparagraphs 6.6.1 and 6.6.2 are not agreed to by all of the Parties before being submitted to the LCR Adjudication Court for approval, the Parties who are not in agreement may object to the incorporation of all or portions of such Abstracts in the LCR Decree. After the incorporation of the Abstracts described in Subparagraphs 6.6.1 and 6.6.2 in the LCR Decree, such Abstracts shall be binding on all parties to the LCR Adjudication.

## **6.7 PLACE OF USE FOR WATER RIGHTS AND USES OF WATER SUBJECT TO SETTLEMENT AGREEMENT**

6.7.1 The rights of the San Juan Southern Paiute Tribe, or the United States acting as trustee for the San Juan Southern Paiute Tribe, to the Water described in Subparagraphs 6.2.3, 6.2.4, and 6.3.1 may not be sold, leased, transferred or in any way used off of the San Juan Southern Paiute Southern Area or off of land held in trust by the United States for the benefit of the San Juan Southern Paiute Tribe.

6.7.2 Water Use on lands held in trust by the United States for the benefit of the San Juan Southern Paiute Tribe shall be governed by Subparagraphs 6.5 and 6.6.

6.7.3 Water Use on lands owned in fee by the San Juan Southern Paiute Tribe shall be governed by Subparagraphs 6.4, 6.5, and 6.6.

## **7.0 NAVAJO NATION AND HOPI TRIBE INTER-TRIBAL AGREEMENT FOR USES OF THE MANAGED WASHES AND N-AQUIFER**

When used in this Paragraph 7.0: (a) the term “Tribes” refers to the Navajo Nation and the Hopi Tribe; and (b) the term “Tribe” refers to either the Navajo Nation or the Hopi Tribe. The purpose of this Paragraph 7.0 is to address inter-tribal issues respecting Uses by the Tribes of the Managed Washes, Minor Tributary Washes, and N-Aquifer, and certain related obligations of the United States.

### **7.1 TRIBAL WASH MANAGEMENT**

Consistent with Paragraphs 4.0 and 5.0, and subject to the terms of this Paragraph 7.0, the Navajo Nation and the Hopi Tribe, or the United States acting as trustee for either of the Tribes, shall each have the right to utilize all Surface Water flowing through the Managed Washes and their tributaries for all historic and existing Uses, but neither Tribe, nor the United States acting as trustee for either of the Tribes, shall modify those Uses except as provided in this Paragraph 7.0. Any modification by the United States acting as trustee for either of the Tribes shall be in consultation with and upon agreement of the Tribes. This Paragraph 7.0 shall not apply to any Water Use downstream of the southern boundary of the Hopi Reservation.

7.1.1 Historic and Existing Irrigation Uses.

7.1.1.1 All irrigation Uses of Water in the Managed Washes and Minor Tributary Washes that occurred prior to or existed on the Effective Date, as set forth in Exhibits 7.1.1.1A and 7.1.1.1B may resume or continue and shall not be subject to objection, dispute, or challenge by the parties to the LCR Adjudication, provided that should a dispute between the Tribes arise as to whether a particular Use occurred prior to or existed on the Effective Date, the dispute resolution procedures in Subparagraph 7.3 shall apply.

7.1.1.2 The historic irrigation projects that Divert Surface Water directly out of the Managed Washes have been designated and assigned acreages; they are listed in Exhibits 7.1.1.2A, 7.1.1.2B, and 7.1.1.2C. The general locations of the designated historic irrigation projects are shown in Exhibit 7.1.1.2D.

7.1.1.3 Rehabilitation and Betterment is permitted for historic and existing Uses subject to the limitations in this Subparagraph 7.1. Historic Irrigation Diversion Capacity shall be determined from historical records or evidence. If the Historic Irrigation Diversion Capacity cannot be substantiated by historical records or evidence, an on-farm water duty of one cubic foot per second per ninety acres will be used as the design criteria for all Rehabilitation and Betterment projects.

7.1.1.3.1 Rehabilitation and Betterment are permitted for the designated historic irrigation projects listed in Exhibits 7.1.1.2A, 7.1.1.2B, and 7.1.1.2C.

7.1.1.3.2 Rehabilitation is permitted for historic and existing irrigation that is not within a designated historic irrigation project.

7.1.1.3.3 Rehabilitation and Betterment are permitted for a dike used for historic or existing irrigation that is not within a designated historic irrigation project, provided that the height and length of the dike is not increased except as reasonably necessary to restore dike functionality consistent with originally intended storage and diversion amounts. Historic and existing dike properties shall be determined from historical records or other evidence such as Bureau of Indian Affairs aerial photographs.

7.1.1.3.4 Rehabilitation and Betterment are permitted for historic and existing irrigation that Diverts Surface Water from a Minor Tributary Wash, provided that the historic or existing irrigation acreage subject to the Rehabilitation and Betterment from any single Diversion structure does not exceed seventy-five acres.

7.1.1.3.5 The benefits from the Rehabilitation and Betterment of a joint designated historic irrigation project shall be shared by the Tribes in approximate proportion to their designated acreage as listed in Exhibit 7.1.1.2C.

7.1.1.3.6 Historic and existing irrigation may be relocated provided that an equivalent amount of acreage is retired (or idled) and no downstream historic or existing irrigation is impaired.

7.1.1.3.7 Without limiting or impairing the irrigation Uses of Water in the Managed Washes and Minor Tributary Washes permitted by the foregoing provisions of this Subparagraph 7.1, installation, construction, maintenance, repair, replacement, and relocation of low technology structures (for example, earthen berms) and nonpermanent Diversions to support Akchin farming, flood-water farming, and other traditional farming practices are expressly permitted.

7.1.2 Other New Surface Water Impoundments.

7.1.2.1 The Tribes agree not to construct new Permanent Surface Water Control Structures designed as reservoirs on the mainstem of the Managed Washes upstream of the other Tribe without the Prior Written Consent of the other Tribe, provided, however, the Tribes may construct new Permanent Surface Water Control Structures on the mainstem of the Managed Washes upstream of the other Tribe that prevent additional erosion, backfill incised reaches, and enhance local recharge as part of watershed restoration efforts, with fifteen (15) days' written notice to the other Tribe.

7.1.2.2 Pursuant to the provisions of Subparagraph 7.5, each Tribe shall notify the other of the planned construction of any new Impoundment capable of fifteen (15) AFY or more of storage it proposes to undertake upstream of the other Tribe, subject to the provisions of Subparagraph 7.1.2.3, and shall not engage in such construction without the Prior Written Consent of the other Tribe.

7.1.2.3 Pursuant to the provisions of Subparagraph 7.5, each Tribe shall notify the other of any plan to move Impoundment capacities within the same Managed Wash drainage, except that capacities of Impoundments downstream of the Hopi Reservation, including those on Jeddito Island, may not be moved upstream of the Hopi Reservation. However, the aggregate capacity of all Impoundments that exist as of the Effective Date (exclusive of the Peabody Impoundments and the Pasture Canyon Impoundments, sewage lagoons, and those permitted pursuant to Subparagraph 7.1.2.4) within each of the Main Wash drainages listed in Exhibit 7.1.2.3 may not be exceeded without the Prior Written Consent of the other Tribe. The Tribes acknowledge and agree that the Peabody Impoundments are permanently located and shall not be moved.

7.1.2.4 New Surface Water Impoundments shall be allowed on Minor Tributary Washes on the lands awarded to the Hopi Tribe pursuant to the 1934 Act Case, up to an aggregate capacity for all such structures of three hundred (300) acre-feet.

7.1.3 Moenkopi Wash Alluvial Aquifer Storage. The Tribes agree to jointly investigate the feasibility of an alluvial recharge/storage project to store a portion of the seasonal flows of Moenkopi Wash along the Wash for the benefit of Hopi and Navajo farmers. If the Tribes mutually determine that the project is feasible, the Tribes shall cooperate in the project's planning and implementation.

7.1.4 Additional Provisions for Moenkopi Wash.

7.1.4.1 Subject to the continuing jurisdiction of the United States District Court for the District of Arizona in the 1934 Act Case, Use of the source Waters of Pasture Canyon, including springs, water storage facilities, and direct runoff, shall be governed exclusively by this Subparagraph 7.1.4.1 and not by any other provisions of Subparagraph 7.1. All Water yields of Pasture Canyon are reserved for Use by the Hopi Tribe, except for: (1) the rights of individual Members of the Navajo Nation recognized in the 1934 Act Case; and (2) any rights to use Water, as of the Effective Date, upstream of the northern boundary of the Hopi Reservation in Pasture Canyon or which were previously served by the Pasture Canyon ditches. Notwithstanding the foregoing, unused tailwater may be Diverted into the Kerley Valley Project for use by either or both Tribes. The Navajo Nation shall not transfer its Uses in Pasture Canyon permitted in this Subparagraph 7.1.4.1 to any other location or source.

7.1.4.2 Each Tribe may Divert Water from Moenkopi Wash above the Kerley Valley Project dam for historic and existing irrigation.

7.1.4.3 After accounting for Diversions permitted by this Agreement, the direct flows within Moenkopi Wash at the Kerley Valley Project dam and any Effluent made available by a Tribe for use by the Kerley Valley Project shall be allocated to the Tribes in proportion to each Tribe's acreage within the Kerley Valley Project as set forth in Exhibit 7.1.1.2C.

7.1.4.4 The Navajo Nation and the Hopi Tribe agree that the Rehabilitation and Betterment of the Kerley Valley Project should be fully investigated. If the Tribes determine that the project should proceed, the Tribes shall cooperate in its planning and implementation.

7.1.5 Closed Basins. Water Uses in the sub-basins identified in Exhibits 3.1.21A and 3.1.21B (sub-basins located in a Managed Wash or a Minor Tributary Wash that do not contribute any surface flow outside of that sub-basin) are not subject to the provisions of this Subparagraph 7.1.

7.1.6 Monitoring. The Hopi Tribe and the Navajo Nation agree to cooperate in seeking the continuation of the programs for the monitoring of stream flows on the Managed Washes to facilitate monitoring of the effects of Subparagraph 7.1 concerning the Use of Water from Managed Washes.

7.1.7 Watershed Restoration. The Navajo Nation and the Hopi Tribe agree to cooperate on efforts to restore the watersheds on their reservations, recognizing that such efforts may improve habitat, enhance stream flows, and reduce sediment and floods to the benefit of both Tribes. Without limiting the agreement to cooperate set forth in the immediately preceding sentence, Low Technology Watershed Restoration is permitted. In addition to Low Technology Watershed Restoration, except as provided in Subparagraph 7.1.2.1, installation, construction, maintenance, repair, replacement, and relocation of water control structures to support Watershed Restoration are: (a) permitted in the Minor Tributary Washes; and (b) permitted in the Major Tributary Washes with the

Prior Written Consent of the other Tribe, which consent shall not be unreasonably withheld, conditioned or delayed, and shall be deemed given unless the Tribe whose consent is required shall fail to object in writing, with reasonable particularity insofar as concerns the basis for the objection, within six (6) months following receipt of a written request for consent from the other Tribe, which request for consent shall include a reasonably detailed description of the proposed undertaking and the purposes to be served thereby. If there is a circumstance where a Tribe wishes to enter the other Tribe's reservation to conduct Low Technology Watershed Restoration or other permitted watershed restoration activities, that Tribe must obtain Prior Written Consent from the other Tribe. All Watershed Restoration activities will comply with applicable federal and tribal laws and regulations.

## **7.2 N-AQUIFER PROVISIONS**

The provisions of this Subparagraph 7.2 apply only to the Use of Underground Water from the N-Aquifer by the Tribes or by the United States acting as trustee for either of the Tribes.

### **7.2.1 General Purposes and Goals.**

7.2.1.1 To provide a permanent homeland for the Hopi Tribe and the Navajo Nation, the Tribes shall limit their pumping of the N-Aquifer to provide a long-term reliable water supply to meet the domestic and municipal demands of the Tribes.

7.2.1.2 The Tribes shall limit their pumping of the N-Aquifer to accomplish the general purpose described in Subparagraph 7.2.1.1 in a manner that:

(a) protects the underground environment of the N-Aquifer on a long-term basis for

use by present and future generations; and (b) recognizes the significance of springs that rely on the N-Aquifer to both Tribes and includes reasonable measures to protect spring flows, taking into account natural variability, climate change, aridification, mega-drought, and other ecological, meteorological, and hydrological considerations.

7.2.2 N-Aquifer Monitoring. The United States, in consultation with the Tribes, shall continue to monitor the N-Aquifer, as follows:

7.2.2.1 N-Aquifer Monitoring Scope. The Secretary, acting through the United States Geological Survey, and subject to the availability of funding, shall expand the scope of its monitoring program in the Black Mesa area. Such expanded scope shall include: (a) a survey of N-Aquifer springs developed in coordination with the Tribes; and (b) monitoring and collection of hydrologic data on selected representative springs identified in consultation with the Tribes.

7.2.2.2 Commencing five years after the Enforceability Date and every five years thereafter, subject to the availability of funding, the United States Geological Survey shall prepare an assessment report on the N-Aquifer. Such report shall include an assessment regarding existing Underground Water withdrawals and the effect of such withdrawals on flows from the selected springs and N-Aquifer water levels, and predictions of future effects of anticipated withdrawals on flows from the selected springs and N-Aquifer water levels.

7.2.2.3 Commencing five years after the Enforceability Date and every five years thereafter, subject to the availability of funding, the United States Geological Survey will update an existing, or develop a new, groundwater model to conduct predictions of future effects of anticipated withdrawals on N-Aquifer water levels, and on the timing and magnitude of changes in combined spring discharge volumes.

7.2.2.4 The United States Geological Survey and the Tribes shall meet periodically to discuss technical issues related to the N-Aquifer monitoring and potential modification of the monitoring.

7.2.2.5 The Hopi Tribe and the Navajo Nation shall cooperate and attempt to secure funding for the activities described in this Subparagraph 7.2.2 to be performed from time to time by United States Geological Survey. No additional expenditures of money by either Tribe shall be required to fund the activities described in this Subparagraph 7.2.2 to be performed from time to time by United States Geological Survey; provided, that in the event funding is unavailable from time to time, the Hopi Tribe shall endeavor in good faith to cover forty percent (40%) of any funding shortfall from Hopi Tribe sources of funding, and the Navajo Nation shall endeavor in good faith to cover sixty percent (60%) of any funding shortfall from Navajo Nation sources of funding.

7.2.3 N-Aquifer Management Terms.

7.2.3.1 Prohibition on N-Aquifer Exports to Areas Outside Reservation. Except as provided in Subparagraphs 4.18.6 and 5.15.6, neither Tribe may export Underground Water outside the Hopi Reservation or the Navajo Reservation.

7.2.3.2 Priority for Domestic Use or Municipal Use. The Navajo Nation and the Hopi Tribe agree to give priority to Domestic Use and Municipal Use so long as they are consistent with Subparagraph 7.2.

7.2.3.3 Pumping Limitations. Total pumping from the Confined Aquifer and the Shonto Recharge Area within the LCR Watershed (as depicted in Exhibit 3.1.24) shall not exceed 14,000 AFY. Of this total limit, pumping by the Navajo Nation shall not exceed 8,400 AFY and pumping by the Hopi Tribe shall not exceed 5,600 AFY.

7.2.3.4 Industrial Uses. Neither Tribe may use Underground Water from the Confined Aquifer and the Shonto Recharge Area for Industrial Uses beyond a maximum aggregate of 2,000 AFY per Tribe, without Prior Written Consent of the other Tribe.

7.2.3.5 Development of New Wells After the Effective Date.

7.2.3.5.1 All Well development will occur in a manner consistent with the applicable tribal Well construction code. Each Tribe shall provide written notice to the other Tribe at least 30 days prior to drilling any New Well in the N-Aquifer. The notice will include the location, depth, and casing size of the New Well.

7.2.3.5.2 Neither Tribe may develop a New Well within the Restricted Zone. A replacement Well is not a New Well.

7.2.3.5.3 Boundary Springs. Neither Tribe shall drill a New Well within one and one-half miles of any N-Aquifer spring listed in Exhibit 7.2.3.5.3 that is located on the property of the other Tribe, without Prior Written Consent of the other Tribe.

7.2.3.5.4 Tuba City Wells. Neither Tribe shall drill or permit to be drilled a New Well within the Pasture Canyon Springs Buffer Zone specified in Exhibit 7.2.3.5.4 without Prior Written Consent of the other Tribe.

7.2.4 NTUA and Moenkopi. The Tribes agree to develop an interconnection between the Navajo Tribal Utility Authority water infrastructure at Tuba City and water infrastructure at Moenkopi, in order to create mutually beneficial redundancy, facilitate water exchanges, anticipate the provision of Colorado River Water for Tuba City and the Hopi Reservation via the iiná bá-paa tuwaqat'si pipeline, and for other settlement purposes.

### **7.3 DISPUTE RESOLUTION**

7.3.1 Application. For purposes of Paragraph 7.0, the following provisions shall apply following the Effective Date whenever either Tribe notifies the other Tribe in writing if it believes the other Tribe is acting in violation of Subparagraphs 7.1 or 7.2 and the Tribes have first met in good faith and failed to resolve their dispute.

7.3.2 Special Inter-Tribal Commission. In the event of a dispute under Subparagraphs 7.1, 7.2.1, 7.2.3, or 7.2.4, following good faith efforts to amicably resolve the dispute, if such efforts are unsuccessful the Tribes shall arbitrate the dispute under the Federal Arbitration Act pursuant to this provision.

7.3.2.1 The arbitrators will be an Inter-Tribal Commission, consisting of five members. The Commission will have two members selected by the Hopi Tribe, two members selected by the Navajo Nation, and one neutral member. At least one member for each Tribe shall have either hydrological training or be an employee of the Tribe's Water Resources Department (or equivalent). The Commission's sole responsibilities shall be to resolve matters between the Tribes concerning compliance with Subparagraphs 7.1, 7.2.1, 7.2.3, or 7.2.4, including actions to adopt, revise, implement, or enforce the N-Aquifer management terms in accordance and consistent with the general purposes and goals set forth in Subparagraph 7.2.1.

7.3.2.2 The fifth member of the Commission shall be a retired judge appointed by the joint decision of the Tribes. The fifth member will sit for a five-year term and may be re-appointed by the Tribes if they so agree. In the event of a vacancy in the position of the fifth member, the Tribes shall jointly appoint a new fifth member. The fifth member will sit as the Chairman of the Commission. In the event of an arbitration hearing, the Chairman will rule on the admissibility of evidence.

7.3.2.3 The Commission shall establish its own rules and procedures for the resolution of any dispute brought before it, consistent with the Federal Arbitration Act, hearing such evidence and argument as it may, in its discretion, choose to accept.

7.3.2.4 The Commission may attempt to resolve the matter by formal and informal means and the Chairman may communicate with the Tribes *ex parte*. The Commission shall seek by informal means to obtain a mutually agreeable resolution of the dispute, prior to any formal arbitration proceedings.

7.3.2.5 The Commission shall render a decision following arbitration which may include issuance of restraining orders, injunctions, declaratory judgments, and orders of specific performance enforcing the terms of the arbitration decision, but the Commission shall not have the authority to award damages, attorneys' fees, or the costs of arbitration. The Commission shall decide and resolve a dispute by issuing a written decision signed by a majority of the five members within 180 days after receiving the request for dispute resolution. Decisions of the Commission shall be final and binding on the Tribes.

7.3.3 Fees and Costs. The fees and costs of the Chairman will be split equally between the Tribes, including any costs for the hearing room, court reporters, and costs associated with a hearing. The fees and costs of the other four members of the Commission will be paid by the Tribe that appointed the members. Each Tribe shall be responsible for its own attorneys' fees and costs.

7.3.4 Enforcement of Award. Any award shall be enforced by the United States District Court for the District of Arizona.

**7.4 LIMITATION.**

Neither the Tribes nor the special Inter-Tribal Commission described in Subparagraph 7.3 shall have any power to interpret, modify, or amend the LCR Decree. Only the LCR Adjudication Court shall have the power to interpret, modify, or amend the LCR Decree, without limiting the right of appeal.

**7.5 NOTICES.**

7.5.1 For purposes of this Paragraph 7.0, when Prior Written Consent is required, and unless otherwise provided, a Tribe shall provide sixty (60) days' written notice to the other Tribe in advance of taking the action that requires Prior Written Consent. Said notice shall prominently state at the top of its first page the following:

THIS NOTICE IS DELIVERED PURSUANT TO PARAGRAPH 7.5.1 OF THE  
NORTHEASTERN ARIZONA INDIAN WATER RIGHTS SETTLEMENT AGREEMENT.  
FAILURE TO RESPOND WITHIN SIXTY (60) DAYS SHALL BE DEEMED CONSENT BY  
THE [INSERT NAME OF TRIBE RECEIVING NOTICE] TO THE [INSERT NAME OF TRIBE  
PROVIDING NOTICE] TO TAKE THE ACTION DESCRIBED BELOW.

In response to such prior written notice, the receiving Tribe shall provide its agreement or denial of consent to the notifying Tribe no later than sixty (60) days after receipt of the prior written notice. If the Tribe receiving notice shall fail to respond to the notifying Tribe's

request for consent within sixty (60) days of receipt of the prior written notice, the notifying Tribe may deem the Prior Written Consent as having been given.

7.5.2 All notices intended to impose liability on the Hopi Tribe or the Navajo Nation or exercise a right based on this Paragraph 7.0 shall be in writing and sent by certified or registered mail, return receipt requested, or hand delivered by an authorized agent of either party, or delivered by a nationally recognized overnight courier (such as FedEx or UPS). Notices shall be sent to the address set forth below or to such other address as may be designated by notice and shall be effective the date received or refused, but in no event later than (3) days after the notice was mailed, or if by hand delivery or courier delivery, the day delivered. If courier delivery is refused or not able to be made, the day delivery was first attempted shall be deemed the delivery date.

If to the Hopi Tribe:                    Hopi Tribe  
    Office of General Counsel  
    PO Box 123  
    Kykotsmovi, Arizona 86039  
    928-734-3142

Hopi Tribe  
Director, Department of Natural Resources  
PO Box 123  
Kykotsmovi, Arizona 86039  
928-734-3602

If to the Navajo Nation:            Director  
    Navajo Nation Department of Water Resources  
    P.O. Box 678  
    Fort Defiance, Arizona 86504  
    928-729-4003

Office of the Attorney General  
Navajo Nation Department of Justice

P.O. Box 2010  
Old BIA Club Building  
Window Rock, Arizona 86515  
928-871-6343

## **8.0 OFF-RESERVATION USES OF SURFACE WATER**

### **8.1 PARAGRAPH 8.0 LIMITED TO SURFACE WATER DIVERSIONS AND USES AND IMPOUNDMENTS OF WATER OUTSIDE THE NAVAJO RESERVATION, THE SAN JUAN SOUTHERN PAIUTE RESERVATION, AND THE HOPI RESERVATION IN THE LCR WATERSHED; EXPANDED DEFINITION OF TRIBES**

8.1.1 This Paragraph 8.0 applies only to Surface Water Diversions and Uses within the LCR Watershed and outside of the Navajo Reservation, the San Juan Southern Paiute Reservation, and the Hopi Reservation. Notwithstanding Subparagraph 3.1.112, Navajo Reservation, as used in this Paragraph 8.0, shall not include lands taken into trust as part of the Navajo Reservation subsequent to the Effective Date.

8.1.2 Expanded Definition of Tribes. For purposes of this Paragraph 8.0, “Tribes” shall mean the Navajo Nation, the San Juan Southern Paiute Tribe, the Hopi Tribe, and their agents or any third-party acting on behalf thereof. “Tribe” shall mean any one of the Tribes. The expanded definition of Tribes does not apply to the United States when acting as trustee for the Navajo Nation, the San Juan Southern Paiute Tribe, the Hopi Tribe, Hopi Allottees, Navajo Allottees, and Public Domain Allottees.

### **8.2 EXISTING SURFACE WATER USES**

8.2.1 Existing Surface Water Uses Described in an Abstract

8.2.1.1 Exhibits 8.2.1.1A, 8.2.1.1B, 8.2.1.1C, 8.2.1.1D, 8.2.1.1E, 8.2.1.1F, 8.2.1.1G, 8.2.1.1H, 8.2.1.1I, and 8.2.1.1J describe Existing Surface Water Uses of specific Claimants.

8.2.1.2 Claimants required to submit Abstracts pursuant to Subparagraph 8.2.1.1 include:

8.2.1.1A	Arizona Game & Fish Commission: Chevelon Cr. Wildlife Area Chevelon Canyon Lake
8.2.1.1B	Bar T Bar Ranch, Inc.
8.2.1.1C	Flying M Ranch, Inc.
8.2.1.1D	Flagstaff, City of
8.2.1.1E	Grover's Hill Irrigation District
8.2.1.1F	SRP C.C. Cragin Reservoir
8.2.1.1G	Show Low, City of
8.2.1.1H	Show Low Pinetop Woodland Irrigation Co.
8.2.1.1I	Silver Creek Irrigation District
8.2.1.1J	Winslow, City of

8.2.1.3 Except as provided in Subparagraph 15.5.3, the Parties, including the Claimant identified in an Abstract, the Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees:

8.2.1.3.1. Shall not object to, dispute, or challenge, on any basis, in the LCR Adjudication or in any other judicial or administrative proceeding, any Existing Surface Water Use described in Exhibits 8.2.1.1A, 8.2.1.1B, 8.2.1.1C, 8.2.1.1D, 8.2.1.1E, 8.2.1.1F, 8.2.1.1G, 8.2.1.1H, 8.2.1.1I, and 8.2.1.1J; and

8.2.1.3.2 Agree to the entry of a decree setting forth water rights with the attributes described in the Exhibits 8.2.1.1A, 8.2.1.1B, 8.2.1.1C, 8.2.1.1D, 8.2.1.1E, 8.2.1.1F, 8.2.1.1G, 8.2.1.1H, 8.2.1.1I, and 8.2.1.1J.

8.2.1.4 The Claimant of an Existing Surface Water Use described in Exhibits 8.2.1.1A, 8.2.1.1B, 8.2.1.1C, 8.2.1.1D, 8.2.1.1E, 8.2.1.1F, 8.2.1.1G, 8.2.1.1H, 8.2.1.1I, or 8.2.1.1J shall not claim a storage capacity for the Existing Surface Water Use that is greater than the storage capacity described in the Exhibit. The Parties, including the Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, retain the right to object to, dispute, or challenge a Claimant's assertion of a storage capacity for an Existing Surface Water Use described in Exhibits 8.2.1.1A, 8.2.1.1B, 8.2.1.1C, 8.2.1.1D, 8.2.1.1E, 8.2.1.1F, 8.2.1.1G, 8.2.1.1H, 8.2.1.1I, or 8.2.1.1J that is greater than the storage capacity described in the Exhibit.

8.2.1.5 The Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not place a call, or exercise rights of priority, against an Existing Surface Water Use described in Exhibits 8.2.1.1A,

8.2.1.1B, 8.2.1.1C, 8.2.1.1D, 8.2.1.1E, 8.2.1.1F, 8.2.1.1G, 8.2.1.1H, 8.2.1.1I, and 8.2.1.1J.

8.2.2 Existing Surface Water Uses Not Described in an Abstract

8.2.2.1 Any Existing Surface Water Use not described in Exhibits 8.2.1.1A, 8.2.1.1B, 8.2.1.1C, 8.2.1.1D, 8.2.1.1E, 8.2.1.1F, 8.2.1.1G, 8.2.1.1H, 8.2.1.1I, and 8.2.1.1J shall be subject to Subparagraph 8.2.2.

8.2.2.2 The Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not object to, dispute, or challenge, on any basis, in the LCR Adjudication or in any other judicial or administrative proceeding, any Existing Surface Water Use not described in Exhibits 8.2.1.1A, 8.2.1.1B, 8.2.1.1C, 8.2.1.1D, 8.2.1.1E, 8.2.1.1F, 8.2.1.1G, 8.2.1.1H, 8.2.1.1I, and 8.2.1.1J.

8.2.2.3 The Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not place a call, or exercise rights of priority, against any Existing Surface Water Use not described in Exhibits 8.2.1.1A, 8.2.1.1B, 8.2.1.1C, 8.2.1.1D, 8.2.1.1E, 8.2.1.1F, 8.2.1.1G, 8.2.1.1H, 8.2.1.1I, and 8.2.1.1J; provided, however, that the Hopi Tribe retains the right to make calls or exercise rights of priority against any Existing Surface Water Use subject to the jurisdiction of the Norviel Decree Court, based on the Hopi Tribe's rights granted by the Norviel Decree.

8.2.3 The United States acting as trustee for the Public Domain Allottees shall not object to, dispute, or challenge, on any basis, in the LCR Adjudication or in any other judicial or administrative proceeding, claims to Existing Surface Water Uses.

### **8.3 SURFACE WATER USES OF THE ZUNI TRIBE ABSTRACTED IN THE LCR ADJUDICATION**

The Parties, including the Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, agree to be bound by the Zuni Indian Tribe Water Rights Settlement Judgment and Decree. The Abstracts for Surface Water uses for Zuni Lands set forth in Exhibit 4.1.A(1) *et seq.* to the Zuni Indian Tribe Water Rights Settlement Agreement of 2002, as amended, and the Zuni Indian Tribe Water Rights Settlement Judgment and Decree are attached as Exhibit 8.3A and Exhibit 8.3B to this Agreement.

### **8.4 NEW SURFACE WATER USES**

8.4.1 Initiation of New Surface Water Uses. After the Effective Date, the Parties, including the Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall initiate New Surface Water Uses: (a) with respect to Parties other than the Tribes and the United States, only in accordance with State law and this Agreement; and (b) specifically with respect to the Tribes and the United States, in accordance with Subparagraphs 4.11.2, 4.11.3, 4.12.2, 4.12.3, 4.13.2, 4.14.2, 4.14.3, 4.15.2, 4.15.3, 4.16.2, 5.10.2, 5.10.3, 5.11.2, 5.11.3, 5.12.2, 6.4.2, 6.4.3, 6.5.2, 6.5.3, and 6.6.2, as applicable.

8.4.2 Agreement not to Object to, Dispute or Challenge. Except as provided in Subparagraphs 4.6.4, 8.4.6, 8.6.6, and 8.6.7, the Tribes, and the United States acting as

trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not object to, dispute, challenge, place a call, or exercise rights of priority against New Surface Water Uses, in the LCR Adjudication or in any other judicial or administrative proceeding; provided, however, that the Tribes, and the United States acting as trustee for the Tribes, retain the right to place a call or exercise rights of priority against New Surface Water Uses based on rights to the Use of Surface Water arising under State law or this Agreement that are associated with land owned in fee by a Tribe or Off-Reservation land held in trust by the United States for the benefit of a Tribe.

8.4.3 No New Surface Water Uses for Irrigation by Direct Diversion. After the Effective Date, the Parties, including the Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not initiate New Surface Water Uses for Irrigation by means of direct Diversion of Surface Water. As used in this Subparagraph, direct Diversion of Surface Water excludes the withdrawal of Underground Water from a Well.

8.4.4 No New Surface Water Uses in Three-Canyon Area by Means of Direct Stream Diversion. After the Effective Date, the Parties, including the Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not initiate new non-De Minimis Uses by means of direct Diversion of Surface Water in the Three-Canyon Area, except as provided in Subparagraphs 8.6.3 and 8.8.2. As used in this Subparagraph, direct Diversion of Surface Water excludes the withdrawal of Underground Water from a Well.

8.4.5 No New Surface Water Uses in Norviel Decree Area. Notwithstanding any provision of Subparagraph 8.4, no New Surface Water Uses may be initiated within the area of the LCR Watershed subject to the jurisdiction of the Norviel Decree Court.

8.4.6 The Parties, including the Tribes and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, retain the right to object to, challenge, dispute, place a call on, or exercise rights of priority against any Person, including a Party, that initiates a New Surface Water Use contrary to the provisions of Subparagraphs 8.4.3, 8.4.4, or 8.4.5. The LCR Adjudication Court or the Norviel Decree Court, as applicable, shall have exclusive jurisdiction to resolve any objections, challenges, disputes, calls, or exercises of rights of priority brought by a Party, including a Tribe or the United States, acting as trustee for a Tribe, a Hopi Allottee, or a Navajo Allottee, pursuant to this Subparagraph.

8.4.7 The United States acting as trustee for Public Domain Allottees shall not object to, dispute, or challenge, on any basis, in the LCR Adjudication or in any other judicial or administrative proceeding, claims to New Surface Water Uses.

## **8.5 WELLS**

8.5.1 Except as provided in Paragraph 9.0, the Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not object to, dispute, or challenge, in the LCR Adjudication or any other judicial or administrative proceeding, the withdrawal and Use of Underground Water from a Well even if the Well is capturing or will capture Surface Water; nor shall the Tribes, or the United States acting as trustee for the

Tribes, Hopi Allottees, and Navajo Allottees, place a call or exercise rights of priority against such a withdrawal and Use even if the Well is capturing Surface Water or the Well will capture Surface Water in the future.

8.5.2 Atkinson Trading Company Wells and Wellfield Location in the LCR Alluvium Near Cameron. The Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not object to, dispute, or challenge, in the LCR Adjudication or any other judicial or administrative proceeding, the withdrawal or Use of Water from the two Existing Wells or any replacement Well(s) near Cameron owned by the Atkinson Trading Company, Inc., described in ADWR Certificate of Water Right No. 3930.001 and within the NW  $\frac{1}{4}$  SE  $\frac{1}{4}$ , Section 22, T29N, R9E, Gila and Salt River Basin Meridian, Coconino County, Arizona, and more particularly shown in the map attached hereto as Exhibit 8.5.2.

8.5.3 In the event the Navajo Nation determines to locate a Well or wellfields in the LCR alluvium near Cameron to meet demand for future Uses, the Navajo Nation shall meet and confer with the Atkinson Trading Company, Inc. to address Well siting in a manner that does not cause injury to Atkinson Trading Company, Inc.'s withdrawal or Use of Water or Water Rights and any such Wells or wellfield shall be sited in a manner as to: (a) avoid Injury to Water Rights of Atkinson Trading Company, Inc.; (b) avoid interference with Atkinson Trading Company, Inc.'s two Existing Wells and any replacement Well(s) and any future Navajo Nation Wells; and (c) maximize aquifer sustainability consistent with scenario 4 in Exhibit 8.5.3.

8.5.4 Exhibit 8.5.4 is the Abstract for the withdrawal and Use of Water from the two Existing Wells owned by the Atkinson Trading Company, Inc. The two Existing Wells and any replacement Well(s) described in Exhibit 8.5.4 shall be subject to the protections and provisions of Subparagraph 8.5.1. Except as provided in Subparagraph 15.5.3, the Parties, the Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees agree to the entry of a decree that sets forth the Water Right as described in Exhibit 8.5.4.

## **8.6 RESERVOIRS**

8.6.1 Agreement not to Construct New Reservoirs. Except as provided in Subparagraphs 8.6.2 and 8.6.3, after the Effective Date, the Parties, including the Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not construct any New Reservoir outside of the Navajo Reservation, the Hopi Reservation, and the San Juan Southern Paiute Reservation.

8.6.2 Exceptions to Agreement Not to Construct New Reservoirs. After the Effective Date, the Tribes, and United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not object to, dispute, challenge, place a call on, or exercise rights of priority against, in the LCR Adjudication or in any other judicial or administrative proceeding, the impoundment of Water by a New Reservoir in accordance with State law, so long as the New Reservoir:

8.6.2.1 Is wholly contained within a Closed Basin;

8.6.2.2 Is located within the Lower LCR Watershed and the Surface Water stored is used for Municipal Uses in the Lower LCR Watershed;

8.6.2.3 Stores Surface Water that became available for storage as a result of a change in place or purpose of use, or change in point of Diversion within the same Watershed of the LCR, and such change does not cause Injury to Rights to Surface Water;

8.6.2.4 Has no permanent water storage, and is operated solely for flood control purposes;

8.6.2.5 Is permitted by Subparagraph 8.8.2 or Subparagraph 8.8.3;

8.6.2.6 Impounds Effluent;

8.6.2.7 Impounds tailwater that is used to recover operational waste from an Irrigation Use for reuse for any purpose not otherwise prohibited by this Agreement;  
or

8.6.2.8 Impounds Underground Water.

8.6.3 Future Storage of Surface Water by the Navajo Nation and the Hopi Tribe.

8.6.3.1 Future Storage of Water in Lower LCR Watershed

8.6.3.1.1 Except as provided in Subparagraph 8.6.3.1.2, nothing in this Agreement shall be construed to prevent the Navajo Nation, and the United States acting as trustee for the Navajo Nation in consultation with and upon the agreement of the Navajo Nation, from developing, in accordance

with State law: (a) New Reservoirs within the Lower LCR Watershed; or  
(b) additional capacity in Existing Reservoirs within the Lower LCR  
Watershed.

8.6.3.1.2 Notwithstanding Subparagraph 8.6.3.1.1, the Navajo Nation and the United States acting as trustee for the Navajo Nation shall not develop or construct New Reservoirs or develop or construct additional capacity in Existing Reservoirs within the Upper Clear Creek, Lower Clear Creek, and Walnut Creek United States Geological Survey hydrologic unit codes as depicted on the map attached hereto as Exhibit 8.8.2.

8.6.3.2 The Hopi Tribe shall have the right to share up to fifty (50) percent of the yield available to the Navajo Nation or the Hopi Tribe from projects utilizing or bordering Hopi Lands, provided that the Hopi Tribe pays its allocable share of the capital and OM&R costs. Without limiting the generality of the foregoing, the foregoing specifically includes the ability to participate in any future arrangement with the City of Winslow to enlarge McHood Reservoir and share the enlarged capacity. The Hopi Tribe shall grant easements to the Navajo Nation for the impoundment and conveyance of Surface Water on or across Hopi Lands in the Three Canyon Area if said easements are required for any such joint project.

8.6.3.3 Nothing in this Agreement shall create any right of access or easement to impound or convey Surface Water upon or over land owned by another Person.

8.6.4 Operation, Maintenance or Modification of Reservoirs. After the Effective Date, the Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees shall not object to, dispute, challenge, place a call on, or exercise rights of priority against the following, in the LCR Adjudication or in any other judicial or administrative proceeding:

8.6.4.1 The operation or maintenance of any Existing Reservoir, or of any New Reservoir not prohibited by Subparagraph 8.6.1, including de-siltation, draining, dredging, lining to prevent seepage, or any appropriate maintenance of or replacement of any dam, weir, or headgate, so long as: (a) the operation, maintenance, or replacement is consistent with the operating criteria, if any, specified in the decree entered by the LCR Adjudication Court; and (b) the original storage entitlement is not exceeded; and

8.6.4.2 The modification, reconstruction, or replacement of any Existing Reservoir, or of any New Reservoir not prohibited by Subparagraph 8.6.1, including any change in location of a Reservoir as part of such modification, reconstruction, or replacement, and any increase in the capacity of a Reservoir to replace the original capacity lost due to infiltration, sedimentation, or dam failure, so long as: (a) the original storage entitlement is not exceeded; and (b) the location of any such Reservoir remains within the same Watershed of the LCR.

8.6.5 Operation, Modification or Enlargement of Other Impoundments. After the Effective Date, the Tribes, and the United States acting as trustee for the Tribes, Hopi

Allottees, and Navajo Allottees shall not object to, dispute, challenge, place a call on, or exercise rights of priority against the following, in the LCR Adjudication or in any other judicial or administrative proceeding:

8.6.5.1 The operation, modification, or enlargement of Impoundments containing Effluent within the LCR Watershed, in accordance with State law;

8.6.5.2 Tailwater ponds existing as of the Effective Date that are used to recover operational waste from an Irrigation Use for reuse for any purpose not otherwise prohibited by this Agreement; and

8.6.5.3 The operation, modification or enlargement of Impoundments containing Underground Water, in accordance with State law.

8.6.6 The Parties, including the Tribes and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, retain the right to object to, challenge, dispute, place a call on, or exercise rights of priority against any Party or any Person that constructs a New Reservoir other than as provided in Subparagraphs 8.6.2 or 8.6.3. The LCR Adjudication Court shall have exclusive jurisdiction to resolve any objections, challenges, disputes, calls, or exercises of rights of priority brought by the Parties, including a Tribe, or the United States, acting as trustee for a Tribe, a Hopi Allottee, or a Navajo Allottee, pursuant to this Subparagraph.

8.6.7 The Navajo Nation, and the United States acting as trustee for the Navajo Nation and Navajo Allottees, retain the right to object to, challenge, dispute, place a call on, or exercise rights of priority against any Party or any Person that operates, maintains,

modifies, relocates, alters, or enlarges an Existing Reservoir other than as provided in Subparagraphs 8.6.4 and 8.6.5, if the Navajo Nation or the United States acting in its capacity as trustee for the Navajo Nation and Navajo Allottees, can demonstrate that such operation, maintenance, modification, relocation, alteration, or enlargement causes an Injury to Rights to Surface Water. The LCR Adjudication Court shall have exclusive jurisdiction to resolve any objections, challenges, disputes, calls, or exercises of rights of priority brought by the Navajo Nation, or the United States acting as trustee for the Navajo Nation or a Navajo Allottee, pursuant to this Subparagraph.

#### **8.7 APPLICATION FOR SEVERANCE AND TRANSFER, CHANGE IN PLACE OF USE OR PURPOSE OF USE, OR CHANGE IN POINT OF DIVERSION OF A SURFACE WATER USE**

8.7.1 After the Enforceability Date, an application for severance and transfer, change in place of Use or purpose of Use, or change in point of Diversion of a decreed Right to Surface Water by the Tribes, or the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, and in consultation with and upon the agreement of the relevant Tribe, shall be filed with the LCR Adjudication Court. The LCR Adjudication Court shall give notice of any such application to the Court-approved mailing list by electronic means, and direct ADWR to publish notice of the application as ordered by the LCR Adjudication Court. The LCR Adjudication Court may request technical assistance from ADWR in connection with the processing of an application. The decision to grant or deny an application, in whole or in part, shall be made by the LCR Adjudication Court.

8.7.2 The LCR Adjudication Court shall conduct any hearings on an application for severance and transfer, change in place of Use or purpose of Use, or change in point of Diversion of a Surface Water Use filed pursuant to Subparagraph 8.7.1 in the county in which the existing point of Diversion for the Surface Water Use is located.

8.7.3 Except as provided in Subparagraph 8.7.4, after the Effective Date, the Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not object to, dispute, or challenge, in the LCR Adjudication or any other judicial or administrative proceeding, any application:

8.7.3.1 For severance and transfer, change in place of Use or purpose of Use, or change in point of Diversion for a Use of Surface Water; or

8.7.3.2 To relocate an Existing Reservoir, so long as the relocated Reservoir remains in the same Watershed of the LCR.

8.7.4 Subparagraph 8.7.3 shall not apply to the following objections, disputes, or challenges:

8.7.4.1 By the Hopi Tribe, if an application to sever and transfer a Use of Surface Water or an application for a change in purpose of a Use of Surface Water is for a right granted by the Norviel Decree and the application proposes to sever and transfer the use to a point upstream of the Diversions for the 26 Bar Ranch, and the Hopi Tribe can demonstrate that the proposed severance and transfer will cause harm to the Hopi Tribe's rights granted by the Norviel Decree.

8.7.4.2 By a Tribe, or the United States acting as trustee for a Tribe, a Navajo Allottee, or a Hopi Allottee, in consultation with and upon the agreement of the Tribes, to an application to sever and transfer the storage rights of a reservoir with a storage capacity of greater than 500 acre-feet, other than C.C. Cragin Reservoir as provided in Subparagraph 8.8.2 or Lake Mary Reservoirs as provided in Subparagraph 8.8.3, if the Tribe or the United States can demonstrate that the requested severance and transfer will cause Injury to Rights to Surface Water.

8.7.4.3 By the successors in interest of a Tribe for land owned in fee by a Tribe, unless the successor in interest is a Tribe.

8.7.5 Any Water Rights decreed by the Norviel Decree shall retain their character as State based Water Rights, regardless of the identity of the owner and regardless of whether the Water Rights are held in trust for a Tribe.

## **8.8 TRANSPORTATION OF SURFACE WATER AWAY FROM THE LCR WATERSHED**

8.8.1 With the exception of the right to Divert and transport Surface Water from C.C. Cragin Reservoir for use outside the LCR Watershed as provided in Subparagraph 8.8.2 and the right to Divert and transport Surface Water from Lake Mary Reservoirs and other Surface Water rights owned by the City of Flagstaff for Use outside of the LCR Watershed as provided in Subparagraph 8.8.3 and set forth in Exhibit 8.2.1.1D, after the Effective Date, the Parties shall not transport Surface Water Diverted within the LCR Watershed for Use outside of the LCR Watershed.

8.8.2 C.C. Cragin Reservoir; Surface Water Transportation, Severance and Transfer and Change in Purpose of Use. This Subparagraph 8.8.2 addresses rights to Surface Water and Uses at C.C. Cragin Reservoir. To the extent that other provisions in Paragraph 8.0 conflict with this Subparagraph 8.8.2, the terms of this Subparagraph 8.8.2 shall control. As of the Effective Date, Certificate of Water Right Nos. 3696.0002 and 3696.0003 for C.C. Cragin Reservoir, and associated amendments to those certificates, permit the transportation of Surface Water from C.C. Cragin Reservoir for Use outside of the LCR Watershed. Except as provided in Subparagraph 15.5.3, after the Effective Date, the Parties, including the Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not object to, dispute, or challenge, in the LCR Adjudication or in any other judicial or administrative proceeding: (a) the Water Right as evidenced by the Certificates of Water Right or any associated amendments to the Certificates of Water Right for C.C. Cragin Reservoir; (b) the severance and transfer of all or any portion of the right to Use Surface Water from C.C. Cragin Reservoir to a location outside of the LCR Watershed in accordance with State law; (c) the change in purpose of use of all or any portion of the right to use Surface Water from C.C. Cragin Reservoir in accordance with State law; or (d) the operation, maintenance, modification, reconstruction, or replacement of C.C. Cragin Reservoir, including the relocation of C.C. Cragin Reservoir within the Upper Clear Creek and Lower Clear Creek United States Geological Survey hydrologic unit codes and depicted on the map attached hereto as Exhibit 8.8.2 as part of any modification, reconstruction, or replacement; or (e) the

increase in capacity of C.C. Cragin Reservoir to replace the original capacity lost to sedimentation or catastrophic dam failure.

8.8.3 This Subparagraph 8.8.3 addresses rights to Surface Water and Uses at Lake Mary Reservoirs. To the extent that other provisions in Paragraph 8.0 conflict with this Subparagraph 8.8.3, the terms of this Subparagraph 8.8.3 shall control. Except as provided in Subparagraph 15.5.3, after the Effective Date, the Parties, including the Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not object to, dispute, or challenge, in the LCR Adjudication or in any other judicial or administrative proceeding, any of the City of Flagstaff's rights to Surface Water and Uses described in Abstracts set forth in Exhibit 8.2.1.1D, or the change in point of Diversion or place of Use for the City of Flagstaff rights to Surface Water and Uses, including the Lake Mary Reservoirs in accordance with State law; or the operation, maintenance, modification, reconstruction, or replacement of the Lake Mary Reservoirs or to commingle Water in the Lake Mary Reservoirs, including the relocation of all or any portion of the Lake Mary Reservoirs within the Lake Mary Watershed as more particularly described in Exhibit 8.8.3, as part of such modification, reconstruction, or replacement; or the increase in capacity of the Lake Mary Reservoirs to commingle Water or to replace the original capacity lost to infiltration, sedimentation, or dam failure.

8.8.4 The Parties, including the Tribes and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, retain the right to object to, challenge, or dispute the Diversion and transportation of Surface Water for Use outside the LCR Watershed that is contrary to the prohibition in Subparagraph 8.8.1. The LCR Adjudication

Court shall have exclusive jurisdiction to resolve any objections, challenges, disputes, calls, or exercises of rights of priority brought by the Parties, including a Tribe or the United States, acting as trustee for a Tribe, a Hopi Allottee, or a Navajo Allottee, pursuant to this Subparagraph.

#### **8.9 AGREEMENT NOT TO ASSERT FORFEITURE OR ABANDONMENT OF EXISTING SURFACE WATER USES**

Due to the unique conditions in the LCR Watershed, including human-made depletions and changes in LCR channel conditions, the LCR is no longer a perennial river. Based on gage data, the LCR near Holbrook is typically dry during the spring and only regularly flows during monsoon storms. The LCR flow near Winslow is generally divided into two seasonal flow periods during summer monsoon storms and during spring snowmelt mostly from the Three Canyon Area. In recognition of this, and with the twin purposes of protecting the spring and monsoon flood flows that reach the Navajo Reservation and protecting existing upstream Uses, the Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not object to, dispute, or challenge, in the LCR Adjudication or any other judicial or administrative proceeding, Existing Surface Water Uses on the basis of forfeiture or abandonment. Except as provided in Subparagraph 15.5.3, no Party, directly or indirectly through an agent or other third-party acting on its behalf, shall object to, dispute, or challenge, in the LCR Adjudication or any other judicial or administrative proceeding, the Hopi Tribe's rights granted by the Norviel Decree on the basis of forfeiture or abandonment.

#### **8.10 BURDEN OF PROOF**

The Navajo Nation, and the United States acting as trustee for the Navajo Nation and Navajo Allottees, shall bear the burden of proof when asserting claims for Injury to Rights to Surface Water pursuant to this Paragraph 8.0.

**9.0 OFF—RESERVATION GROUNDWATER WITHDRAWALS AND USES WITHIN THE LCR WATERSHED**

**9.1** This Paragraph 9.0 applies only to Groundwater withdrawals and Uses within the LCR Watershed and outside of the Navajo Reservation, the Hopi Reservation, and the San Juan Southern Paiute Reservation.

**9.2 EXPANDED DEFINITION OF TRIBES**

For purposes of this Paragraph 9.0, “Tribes” shall mean the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe, and their agents or any third-party acting on their behalf. The expanded definition of Tribes does not apply to the United States when acting as trustee for the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, Hopi Allottees, Navajo Allottees, and Public Domain Allottees.

**9.3 WITHDRAWAL AND USE OF GROUNDWATER BY ANY PERSON OUTSIDE THE BUFFER ZONES**

The Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not object to, dispute, or challenge the withdrawal or Use of Groundwater from any Off-Reservation Well located outside the Buffer Zones, or the drilling or replacement of any Well for the withdrawal and Use of Groundwater located outside the Buffer Zones, in the LCR Adjudication or any other judicial or administrative proceeding. For purposes of this Subparagraph 9.3, any Well located on land owned or

claimed to be owned by Atkinson Trading Company, Inc. as described in Subparagraphs 8.5.2 and 8.5.4 shall be considered an Off-Reservation Well located outside the Buffer Zones.

**9.4 CATALOGING EXISTING WELLS WITHIN THE BUFFER ZONES; RETENTION OF CLAIMS AGAINST PUMPING EXCEEDANCES**

9.4.1 Cataloging Existing Wells Located within the Buffer Zones.

Within 24 months after the Enactment Date, ADWR shall compile a catalog that identifies all Existing Wells within Buffer Zone 1 and all Existing Wells within Buffer Zone 2, other than Existing Wells on lands held in trust by the United States for the benefit of a Tribe. In compiling the catalog, ADWR shall use information in ADWR’s records as of the Enactment Date. The catalog shall identify each Existing Well required to be included in the catalog by well registration number, and shall include the following information for each Existing Well if the information is available in ADWR’s records: location by legal description, and as determined through the use of global positioning system units; owner; casing diameter; the larger of the Well capacity (if equipped) or the casing diameter set forth in the chart below; and date of completion (if known). For unequipped Existing Wells required to be included in the catalog, the following capacities shall be assigned:

<b>Casing Diameter (inches)</b>	<b>Capacity (AFY)</b>
4	87
5	136
6	196
8	348
10	544
12	784
14	1067

16 or larger	1400
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9.4.1.1 Before completing the catalog, ADWR shall post a draft of the catalog on its website, publish notice of the posting of the draft of the catalog in a newspaper of general circulation in the county or counties in which the Buffer Zones are located and send written notice of the posting of the draft of the catalog by first-class mail to each owner of a Non-Exempt Well in the Buffer Zones, other than the owner of an Existing Well on land held in trust by the United States for the benefit of a Tribe, at the owner's address on file with ADWR. The notice shall state that any Existing Well owner may contact ADWR within 180 days after the date of the notice to provide ADWR with information to correct any errors or omissions in the catalog.

9.4.1.2 Once the catalog is completed, ADWR shall submit the catalog to the LCR Adjudication Court for approval, and provide notice: (1) by electronic means, to the LCR Adjudication Court approved mailing list; and (2) by first class mail, to the Parties, all Persons that filed Statements of Claimant for Water sources located in the Buffer Zones, other than for lands held in trust by the United States for the benefit of a Tribe, and all Persons who own Existing Wells identified in the catalog.

9.4.1.3 Any Person, including the Tribes and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, who owns an Existing Well within the Buffer Zones may object to the catalog of Existing Wells in the same Buffer Zone only on the basis that information concerning a Well or Wells in the catalog is inaccurate, or that an Existing Well was omitted from the catalog. The

LCR Adjudication Court shall conduct hearings on any objections, revise the catalog if needed to reflect the resolution of objections, and then approve the catalog.

Upon application to the LCR Adjudication Court prior to approval of the catalog, and upon a showing of good cause, the catalog may be supplemented to include any Existing Wells that were required to be included in the catalog but were omitted, to correct any inaccurate information concerning an Existing Well or to remove a Well from the catalog that was not existing as of the Effective Date.

9.4.1.4 Any Existing Well that is required to be included in the catalog by this Subparagraph 9.4.1, but is not included in the catalog as approved by the LCR Adjudication Court, shall be treated as a New Well.

9.4.1.5 The Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not object to, dispute, or challenge the withdrawal or Use of Groundwater from the Existing Wells listed in the catalog approved by the LCR Adjudication Court, unless:

9.4.1.5.1 An Existing Well within Buffer Zone 1 withdraws an amount in a given Year that exceeds the Well's capacity as set forth in the catalog; or

9.4.1.5.2 An Existing Well within Buffer Zone 2 withdraws an amount that exceeds the Well's capacity as set forth in the catalog, or 500 GPM, or a volume of 800 AFY, whichever is greater.

9.4.1.6 The Navajo Nation, and the United States acting as trustee for the Navajo Nation and Navajo Allottees, retain claims for injury to rights to Groundwater caused by withdrawals of Groundwater from an Existing Well within Buffer Zone 1, to the extent that the withdrawals in a given Year exceed the Existing Well's capacity set forth in the catalog. The claim against the owner of an Existing Well within Buffer Zone 1, as described in this Subparagraph, shall be brought in the LCR Adjudication Court, which shall have exclusive jurisdiction over such disputes.

9.4.1.7 The Navajo Nation and the United States acting as trustee for the Navajo Nation and Navajo Allottees retain claims for injury to rights to Groundwater caused by withdrawals of Groundwater from an Existing Well within Buffer Zone 2, to the extent that the withdrawals exceed the capacity of the Existing Well as set forth in the catalog, or a capacity of 500 GPM or a volume of 800 AFY, whichever is greater. The claim against the owner of an Existing Well within Buffer Zone 2, as described in this Subparagraph, shall be brought in the LCR Adjudication Court, which shall have exclusive jurisdiction over such disputes.

#### 9.4.2 Replacement of Existing Wells.

9.4.2.1 Any Existing Well within Buffer Zone 1 may be replaced with a Well that is: (a) limited to the same capacity as the original Existing Well, as provided in Subparagraph 9.4.1; and (b) located at a site no farther than 660 feet from the location of the original Existing Well. The original Existing Well may be operated in conjunction with the replacement Well as long as the combined withdrawals from both Wells does not exceed the pumping capacity of the original Existing Well.

9.4.2.2 Any Existing Well within Buffer Zone 2 may be replaced with a Well that is: (a) limited to a pumping capacity the same as the original Existing Well, or, if the pumping capacity of the original Well was less than 500 GPM, to a pumping capacity no greater than 500 GPM; and (b) located at a site no farther than 660 feet from the location of the original Existing Well; and (c) outside Buffer Zone 1. The original Existing Well may be operated in conjunction with the replacement Well as long as the combined Groundwater withdrawal from both Wells does not exceed the pumping capacity of the original Existing Well.

9.4.2.3 An Existing Well that is replaced as provided in this Subparagraph 9.4.2 is not a New Well.

9.4.2.4 The owner of an Existing Well that is replaced as provided in this Subparagraph 9.4.2 shall provide notice to the LCR Adjudication Court that the Well has been replaced and request that the catalog of Existing Wells described in Subparagraph 9.4.1 be updated to reflect the new location of the Well and any other changes in the description of the Well as set forth in the catalog.

## **9.5 EXEMPT WELLS WITHIN THE BUFFER ZONES.**

Exempt Wells within the Buffer Zones, regardless of when they are drilled or equipped, shall not be cataloged. The Tribes, and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not object to, dispute, or challenge, in the LCR Adjudication or any other judicial or administrative proceeding, the drilling or

replacement of Exempt Wells or the withdrawal and Use of Groundwater from Exempt Wells within the Buffer Zones, regardless of when the Exempt Wells are drilled or equipped.

#### **9.6 NEW WELLS WITHIN BUFFER ZONE 1**

The Navajo Nation, and the United States acting as trustee for the Navajo Nation and Navajo Allottees, retain claims for injury to rights to Groundwater caused by the withdrawal of Groundwater from a New Well within Buffer Zone 1. The claim against the owner of a New Well within Buffer Zone 1, as described in this Subparagraph, shall be brought in the LCR Adjudication Court, which shall have exclusive jurisdiction over such disputes.

#### **9.7 NEW WELLS WITHIN BUFFER ZONE 2**

For purposes of this Subparagraph 9.7, a series of New Wells within Buffer Zone 2 that serves the same facility shall be considered a single New Well.

9.7.1 The Tribes and the United States acting as trustee for the Tribes, Hopi Allottees, and Navajo Allottees, shall not object to, dispute, or challenge the withdrawal or Use of Groundwater from any New Well within Buffer Zone 2, or the drilling of any Well for the withdrawal and Use of Groundwater within Buffer Zone 2, in the LCR Adjudication or any other judicial or administrative proceeding, if the New Well is equipped with a pumping capacity of 500 GPM or less.

9.7.2 Except as provided in Subparagraph 9.7.4, the Navajo Nation, and the United States acting as trustee for the Navajo Nation and Navajo Allottees, retain claims for injury to rights to Groundwater caused by the withdrawal of Groundwater from a New Well within

Buffer Zone 2 that is equipped with a pumping capacity greater than 500 GPM. The claim against the owner of the New Well within Buffer Zone 2, as described in this Subparagraph, shall be brought in the LCR Adjudication Court, which shall have exclusive jurisdiction over such disputes.

9.7.3 A New Well located on land that is ASLD Land as of the Effective Date in Sections 6 and 12, T20N R11E, and Section 36, T21N R10E, shall be limited to 500 GPM or less.

9.7.4 Notwithstanding Subparagraph 9.7.2, the Navajo Nation, and the United States acting as trustee for the Navajo Nation and Navajo Allottees, shall not retain claims for injury to rights to Groundwater caused by the withdrawal of Groundwater from a New Well within Buffer Zone 2 with a capacity greater than 500 GPM, so long as the New Well complies with the “Well Spacing Configuration” defined below.

9.7.4.1 Pursuant to the “Well Spacing Configuration”, to construct a New Well of greater than 500 GPM, there shall be an offset of acreage, the “Restricted Pumping Acreage,” where no other New Wells can be drilled. “Restricted Pumping Acreage” shall mean the number of acres upon which New Well pumping shall be restricted within Buffer Zone 2 and shall be calculated pursuant to the following formula:

New Well GPM x 1.25 acres = Restricted Pumping Acreage.

And in other words,

Restricted Pumping Acreage x (0.8) = maximum New Well GPM against which a claim is not retained.

For example, for a 1,000 GPM New Well, 1,250 acres [1,000 x 1.25] shall be required as Restricted Pumping Acreage within Buffer Zone 2.

As an additional example, two sections of 640 acres totaling 1,280 acres would provide sufficient Restricted Pumping Acreage to allow for a 1,024 GPM [1,280 x 0.8] New Well in Buffer Zone 2.

9.7.4.2 Restricted Pumping Acreage need not be contiguous to the parcel housing the New Well (the “New Well Parcel”), but all Restricted Pumping Acreage must be within five miles of the New Well. Consistent with the Navajo Nation’s objective to protect against pumping impacts on the Navajo Reservation, Restricted Pumping Acreage shall be identified as those parcels located closest to the Navajo Reservation boundary within Buffer Zone 2. An identification of the Restricted Pumping Acreage shall be provided in writing to the Navajo Nation.

9.7.5 ASLD agrees, solely for the benefit of the Red Gap Ranch Regional Pipeline Project, that:

9.7.5.1 A New Well that is: (a) located on land that is ASLD Land as of the Effective Date; (b) within Buffer Zone 2; (c) within or adjacent to Red Gap Ranch as identified on Exhibit 3.1.134A; and (d) west of Highway 99 shall be limited to a pumping capacity of 500 GPM or less.

9.7.5.2 A New Well that is: (a) located on land that is ASLD land as of the Effective Date; (b) within Buffer Zone 2; and (c) within two miles east of Highway 99 may have a pumping capacity of greater than 500 GPM for a single use only if (1) it complies with the Well Spacing Configuration requirements described in Subparagraph 9.7.4, and (2) the City of Flagstaff provides its prior written consent, to be reasonably withheld only for the benefit of the Red Gap Ranch Regional Pipeline Project.

## **9.8 BURDEN OF PROOF**

The Navajo Nation and the United States acting as trustee for the Navajo Nation and Navajo Allottees shall bear the burden of proof when asserting claims for injury to rights to Groundwater pursuant to this Paragraph 9.0.

## **9.9 ADWR NOTICE**

After the Effective Date, ADWR shall make its best efforts to cause reasonable notice to be made available to persons intending to drill a New Well or replace an Existing Well in Buffer Zone 1 or Buffer Zone 2 of the potential claims available to the Navajo Nation and the United States acting as trustee for the Navajo Nation and Navajo Allottees pursuant to Subparagraphs 9.6 and 9.7. ADWR shall make its best efforts to provide a copy of such notices to the Navajo Nation and the Hopi Tribe.

## **9.10 IN LIEU AGREEMENTS**

The Agreement between the Navajo Nation, the Hopi Tribe, the United States acting as trustee for the Navajo Nation and the Hopi Tribe, Bar T Bar, and the Arizona State Land

Department is attached as Exhibit 9.10 hereto. To the extent that the terms of Paragraph 9.0 conflict with the terms of Exhibit 9.10, the terms of Exhibit 9.10 shall govern the rights and obligations of the parties to that Exhibit.

## **10.0 NAVAJO NATION WATER DELIVERY CONTRACTS AND RELATED PROVISIONS**

### **10.1 WATER DELIVERY CONTRACTS**

The Secretary shall contract with the Navajo Nation for delivery and Use of the Water described in Subparagraphs 4.7, 4.8 and 4.9.

#### 10.1.1 Navajo Nation Upper Basin Colorado River Water

Pursuant to section 6 of the Act, the Secretary shall negotiate and execute one or more contracts for the delivery and Use of Navajo Nation Upper Basin Colorado River Water.

#### 10.1.2 Navajo Nation Cibola Water

Pursuant to section 6 of the Act, the Secretary shall negotiate and execute one or more contracts for the delivery and Use of Navajo Nation Cibola Water.

#### 10.1.3 Navajo Nation Fourth Priority Water

Pursuant to section 6 of the Act, the Secretary shall negotiate and execute one or more contracts for the delivery and Use of Navajo Nation Fourth Priority Water.

### **10.2 TERMS OF WATER DELIVERY CONTRACTS**

10.2.1 A Navajo Nation Water Delivery Contract shall become effective on the Enforceability Date and, once effective, shall be permanent and without limit as to term. The United States shall waive Colorado River Storage Project standby charges and delivery charges and annual administration fees as provided in section 6 of the Act.

10.2.2 Except for storage by the Navajo Nation at the Navajo Reservoir and the Frank Chee Willetto, Sr. Reservoir in New Mexico, a Navajo Nation Water Delivery Contract shall not permit the Use of the Water outside of the State.

10.2.3 A Navajo Nation Water Delivery Contract shall not, either temporarily or permanently, alter or reduce the State's annual Lower Basin apportionment pursuant to the Boulder Canyon Project Act of 1928, 43 U.S.C. 617, et seq., as amended, and the Decree, or annual Upper Basin apportionment pursuant to the Upper Colorado River Basin Compact of 1948, as ratified and reprinted in Title 45, Chapter 7, Article 3 of the Arizona Revised Statutes.

10.2.4 Nothing in a Navajo Nation Water Delivery Contract shall alter or impair the State's rights, authorities, and interests under the Boulder Canyon Project Act of 1928, 43 U.S.C. 617, et seq., as amended, the contract between the United States and the State of Arizona dated February 9, 1944, or the Upper Colorado River Basin Compact of 1948, as ratified and reprinted in Title 45, Chapter 7, Article 3 of the Arizona Revised Statutes, or the Decree.

10.2.5 A Navajo Nation Water Delivery Contract shall not limit the State's ability to seek or advocate changes in the Colorado River system's operating rules, criteria or

guidelines as they apply to the State's apportionments from the Upper Basin and the Lower Basin.

10.2.6 In the event that a Navajo Nation Water Delivery Contract will result in the delivery of Upper Basin Colorado River Water to the Lower Basin or Lower Basin Colorado River Water to the Upper Basin, the Secretary shall confer with the State prior to executing such Navajo Nation Water Delivery Contract concerning: (a) the impact of the Water deliveries on the availability of Upper Basin or Lower Basin Colorado River Water within the State; (b) Reclamation's annual accounting for such Water on the State's Colorado River apportionments in the Upper Basin and Lower Basin; and, if appropriate (c) the impact on the operations of the Central Arizona Project.

10.2.7 A Navajo Nation Water Delivery Contract shall identify: (a) the Water's place(s) of Use; (b) the purpose of the Water's Use(s) during the term of the contract; (c) the mechanism(s) for delivery of the Water; and (d) each point of Diversion under the contract.

10.2.8 Water Service Contract No. 09-WC-40-318 between the United States and the Navajo Nation dated December 23, 2009 for the delivery of up to 950 AFY of water from Lake Powell to the Navajo Nation for municipal and industrial Use within the Community of LeChee shall be replaced with a Navajo Nation Water Delivery Contract for the delivery of Navajo Nation Upper Basin Colorado River Water that complies with all the terms and conditions in this Subparagraph 10.2. Upon the Enforceability Date, Water Service Contract No. 09-WC-40-318 shall terminate.

10.2.9 A Navajo Nation Water Delivery Contract shall not prejudice the interests of the State, or serve as precedent against the State, in any litigation related to the apportionment, Diversion, storage, or Use of Water from the Colorado River system as defined in Article II(a) of the Decree.

10.2.10 In the case of a conflict between a Navajo Nation Water Delivery Contract and this Agreement, this Agreement shall control.

10.2.11 Any material amendment or modification of a Navajo Nation Water Delivery Contract shall comply with all of the terms and conditions in this Subparagraph 10.2.

### **10.3 CONDITIONS OF DELIVERY**

10.3.1 Curtailment of Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water Diverted Above Lee Ferry. Deliveries of Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water effected by the Diversion of Water from the Colorado River above Lee Ferry shall be curtailed during shortages of Colorado River Water to the same extent as other non-CAP Fourth Priority Colorado River Water supplies. Nothing herein precludes the Navajo Nation from firming its Lower Basin Colorado River Water.

10.3.2 Accounting for the Type of Water Delivered. In accordance with section 17 of the Act, deliveries of Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water effected by the Diversion of Water from the Colorado River above Lee Ferry shall be accounted for as deliveries of Lower Basin Colorado River Water.

10.3.3 Accounting Regardless of the Place of Use or Point of Diversion.

10.3.3.1 In accordance with section 17 of the Act, all Navajo Nation Upper Basin Colorado River Water delivered to and consumptively used by the Navajo Nation or its lessees or exchange partners pursuant to this Agreement shall be accounted for: (a) as if such use had occurred in the Upper Basin, regardless of the point of Diversion or place of Use; and (b) as part of the 50,000 acre-feet of Upper Basin Colorado River Water apportioned to the State of Arizona in Article III(a)(1) of the Upper Colorado River Basin Compact of 1948.

10.3.3.2 In accordance with section 17 of the Act, Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water delivered to and consumptively used by the Navajo Nation or its lessees or exchange partners pursuant to this Agreement shall be accounted for: (a) as if such use had occurred in the Lower Basin, regardless of the point of Diversion or place of Use; and (b) as part of the 2.8 million acre-feet of Lower Basin Colorado River Water apportioned to the State of Arizona in Article II(B)(1) of the Decree.

10.3.4 Accounting for Upper Basin Diversions as Lower Basin Deliveries. In accordance with section 17 of the Act, Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water Diverted from the Colorado River or its tributaries above Lee Ferry shall be accounted for as if such water had been delivered to the Lower Basin at Lee Ferry for purposes of Article III(d) of the Colorado River Compact.

#### **10.4 LEASES AND EXCHANGES; LESSEE RESPONSIBILITY FOR CHARGES**

10.4.1 Leases for Use or Storage on the Navajo Reservation. The Navajo Nation may lease Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, and Navajo Nation Fourth Priority Water for Use or storage on the Navajo Reservation in accordance with Navajo Nation leasing regulations and applicable federal law.

10.4.2 Leases and Exchanges for Use or Storage off of the Navajo Reservation. With the approval of the Secretary, the Navajo Nation may enter into contracts to lease, options to lease, contracts to exchange or options to exchange Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, or Navajo Nation Fourth Priority Water. CAWCD's approval shall also be required to deliver Water through the CAP System in any such transaction. Contracts to lease and options to lease shall be for a term not to exceed one hundred (100) years. Contracts to exchange or options to exchange shall be for the term provided for in each such contract or option. The Navajo Nation may renegotiate any lease, at any time during the term of that lease provided the term of such renegotiated lease does not exceed one hundred (100) years. Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, or Navajo Nation Fourth Priority Water shall not be permanently alienated.

10.4.3 Lessee Responsibility for Charges. Notwithstanding Subparagraph 10.2, any lessee of Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, or Navajo Nation Fourth Priority Water shall be responsible for all charges and fees associated with the delivery of such water.

10.4.4 All contracts to lease, exchange, or store Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, or Navajo Nation Fourth Priority Water shall identify: (a) the Water's place(s) of Use or places of storage; (b) the purpose of the Water's Use(s) during the term of the contract; (c) the mechanism(s) for delivery of the Water; and (d) each point of Diversion under the contract. A contract to lease, exchange, or store Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, or Navajo Nation Fourth Priority Water shall not conflict with the Act or this Agreement.

#### **10.5 ENTITLEMENT TO LEASE AND EXCHANGE MONIES**

The Navajo Nation, and not the United States in any capacity, shall be entitled to all consideration due to the Navajo Nation under any contracts to lease, options to lease, contracts to exchange or options to exchange Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water or Navajo Nation Fourth Priority Water. The United States in any capacity shall have no trust obligation or other obligation to monitor, administer or account for, in any manner, any monies received by the Navajo Nation as consideration under any such contracts to lease, options to lease, contracts to exchange, or options to exchange Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water.

#### **11.0 HOPI TRIBE WATER DELIVERY CONTRACTS AND RELATED PROVISIONS**

##### **11.1 WATER DELIVERY CONTRACTS**

The Secretary shall contract with the Hopi Tribe for delivery and Use of the Water described in Subparagraphs 5.7 and 5.8.

11.1.1 Hopi Tribe Upper Basin Colorado River Water.

Pursuant to section 6 of the Act, the Secretary shall negotiate and execute one or more contracts for the delivery and Use of the Hopi Tribe Upper Basin Colorado River Water.

11.1.2 Hopi Tribe Cibola Water

Pursuant to section 6 of the Act, the Secretary shall negotiate and execute the Hopi Tribe Settlement Cibola Contract.

**11.2 TERMS OF WATER DELIVERY CONTRACTS**

11.2.1 A Hopi Tribe Water Delivery Contract shall become effective on the Enforceability Date and, once effective, shall be permanent and without limit as to term. The United States shall waive Colorado River Storage Project standby charges and delivery charges and annual administration fees as provided in section 6 of the Act.

11.2.2 A Hopi Tribe Water Delivery Contract shall not permit the Use of the Water outside of the State.

11.2.3 A Hopi Tribe Water Delivery Contract shall not, either temporarily or permanently, alter or reduce the State's annual Lower Basin apportionment pursuant to the Boulder Canyon Project Act of 1928, 43 U.S.C. 617, et seq., as amended or the Decree, or annual Upper Basin apportionment pursuant to the Upper Colorado River Basin Compact of 1948, as ratified and reprinted in Title 45, Chapter 7, Article 3 of the Arizona Revised Statutes.

11.2.4 Nothing in a Hopi Tribe Water Delivery Contract shall alter or impair the State's rights, authorities, and interests under the Boulder Canyon Project Act of 1928, 43 U.S.C. 617, et seq., as amended, the contract between the United States and the State of Arizona dated February 9, 1944, or the Upper Colorado River Basin Compact of 1948, as ratified and reprinted in Title 45, Chapter 7, Article 3 of the Arizona Revised Statutes or the Decree.

11.2.5 A Hopi Tribe Water Delivery Contract shall not limit the State's ability to seek or advocate changes in the Colorado River system's operating rules, criteria or guidelines as they apply to the State's apportionments from the Upper Basin and the Lower Basin.

11.2.6 In the case of a conflict between a Hopi Tribe Water Delivery Contract and this Agreement, this Agreement shall control.

11.2.7 Any material amendment or modification of a Hopi Tribe Water Delivery Contract shall comply with all of the terms and conditions in this Subparagraph 11.2.

11.2.8 In the event that a Hopi Tribe Water Delivery Contract will result in the delivery of Upper Basin Colorado River Water to the Lower Basin or Lower Basin Colorado River Water to the Upper Basin, the Secretary shall confer with the State prior to executing of such Hopi Tribe Water Delivery Contract concerning: (a) the impact of the Water deliveries on the availability of Upper Basin or Lower Basin Colorado River Water within the State; (b) Reclamation's annual accounting for such Water on the State's Colorado River apportionments in the Upper Basin and Lower Basin; and if appropriate, (c) the impact on the operations of the Central Arizona Project.

11.2.9 A Hopi Tribe Water Delivery Contract shall identify: (a) the Water's place(s) of Use; (b) the purpose of the Water's Use(s) during the term of the contract; (c) the mechanism(s) for delivery of the Water; and (d) each point of Diversion under the contract.

11.2.10 A Hopi Tribe Water Delivery Contract shall not prejudice the interests of the State, or serve as precedent against the State, in any litigation related to the apportionment, Diversion, storage, or Use of Water from the Colorado River system as defined in Article II(a) of the Decree.

### **11.3 CONDITIONS OF DELIVERY**

11.3.1 Curtailment of Fourth Priority Hopi Tribe Cibola Water Diverted Above Lee Ferry. Deliveries of Hopi Tribe Cibola Water effected by the Diversion of Water from the Colorado River above Lee Ferry shall be curtailed during shortages of Colorado River Water to the same extent as other non-CAP Fourth, Fifth, and Sixth Priority Colorado River Water supplies, as applicable. Nothing herein precludes the Hopi Tribe from firming its Lower Basin Colorado River Water.

11.3.2 Accounting for the Type of Water Delivered. In accordance with section 17 of the Act, all deliveries of Hopi Tribe Cibola Water effected by the Diversion of Water from the Colorado River above Lee Ferry shall be accounted for as deliveries of Fourth, Fifth or Sixth Priority Colorado River Water, as applicable.

11.3.3 Accounting Regardless of the Place of Use or Point of Diversion.

11.3.3.1 In accordance with section 17 of the Act, all Hopi Tribe Cibola Water delivered to and consumptively used by the Hopi Tribe or its lessees or exchange

partners pursuant to this Agreement shall be accounted for: (a) as if such use had occurred in the Lower Basin, regardless of the point of Diversion or place of Use; and (b) as part of the 2.8 million acre-feet of Colorado River water apportioned to the State of Arizona in Article II(B)(1) of the Decree.

11.3.3.2 In accordance with Section 17 of the Act, all Hopi Tribe Upper Basin Colorado River Water delivered to and consumptively used by the Hopi Tribe or its lessees or exchange partners pursuant to this Agreement shall be accounted for: (a) as if such use had occurred in the Upper Basin, regardless of the point of Diversion or place of Use; and (b) as part of the 50,000 acre-feet of Upper Basin Colorado River Water apportioned to the State of Arizona in Article III(a)(1) of the Upper Colorado River Basin Compact of 1948.

11.3.4 Accounting for Upper Basin Diversions as Lower Basin Deliveries. In accordance with section 17 of the Act, all Hopi Tribe Cibola Water Diverted from the Colorado River or its tributaries above Lee Ferry for delivery through the iiná bá - paa tuwaqat'si pipeline shall be accounted for as if such water had been delivered to the Lower Basin at Lee Ferry for purposes of Article III(d) of the Colorado River Compact.

#### **11.4 LEASES AND EXCHANGES; LESSEE RESPONSIBILITY FOR CHARGES**

11.4.1 Leases for Use or Storage on the Hopi Reservation. The Hopi Tribe may lease Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water for Use or storage on the Hopi Reservation in accordance with Hopi Tribe leasing regulations and applicable federal law.

11.4.2 Leases for Use or Storage off of the Hopi Reservation. With the approval of the Secretary, the Hopi Tribe may enter into contracts to lease, options to lease, contracts to exchange or options to exchange Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water. CAWCD's approval shall also be required to deliver Water through the CAP System in any such transaction. Contracts to lease and options to lease shall be for a term not to exceed one hundred (100) years. Contracts to exchange or options to exchange shall be for the term provided for in each such contract or option. The Hopi Tribe may renegotiate any lease, at any time during the term of that lease provided the term of such renegotiated lease does not exceed one hundred (100) years. The Hopi Tribe Upper Basin Colorado River Water and the Hopi Tribe Cibola Water shall not be permanently alienated.

11.4.3 Lessee Responsibility for Charges. Notwithstanding Subparagraph 11.2, any lessee of Hopi Tribe Upper Basin Colorado River Water or Hopi Tribe Cibola Water shall be responsible for all charges and fees associated with the delivery of such water.

11.4.4 All contracts to lease, exchange, or store Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water shall identify: (a) the Water's place(s) of Use or places of storage; (b) the purpose of the Water's Use(s) during the term of the contract; (c) the mechanism(s) for delivery of the Water; and (d) each point of Diversion under the contract. A contract to lease, exchange, or store Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water shall not conflict with the Act or this Agreement.

## **11.5 ENTITLEMENT TO LEASE AND EXCHANGE MONIES**

The Hopi Tribe, and not the United States in any capacity, shall be entitled to all consideration due to the Hopi Tribe under any contracts to lease, options to lease, contracts to exchange or options to exchange Hopi Tribe Upper Basin Colorado River Water or Hopi Tribe Cibola Water. The United States in any capacity shall have no trust obligation or other obligation to monitor, administer or account for, in any manner, any monies received by the Hopi Tribe as consideration under any such contracts to lease, options to lease, contracts to exchange, or options to exchange Hopi Tribe Upper Basin Colorado River Water or Hopi Tribe Cibola Water.

## **12.0 INFRASTRUCTURE; FUNDING AND RELATED SUPPORT**

Pursuant to section 9 of the Act, there is established a non-trust settlement fund known as the iiná bá – paa tuwaqat’si pipeline Implementation Fund Account and a series of trust funds to which money will be deposited for use by the Tribes and the United States to plan, design, construct, operate, and maintain water supply infrastructure to the communities of the Navajo Reservation, the Hopi Reservation, and the San Juan Southern Paiute Reservation, as well as trust and fee lands outside the reservations and funds to support those efforts.

### **12.1 IINÁ BÁ - PAA TUWAQAT’SI PIPELINE IMPLEMENTATION FUND ACCOUNT**

12.1.1 Pursuant to section 9 of the Act, there is established a non-trust interest-bearing account known as the iiná bá – paa tuwaqat’si pipeline Implementation Fund Account to be managed and distributed by the Secretary consisting of a mandatory authorization and appropriation of \$1.715 billion, together with any interest earned on that

amount, any indexing, and any additional appropriations authorized pursuant to section 13 of the Act necessary to complete the iiná bá - paa tuwaqat'si pipeline, together with any interest earned on and indexing of such additional appropriations.

12.1.2 The Secretary, acting through the Commissioner of Reclamation, shall plan, design, and construct the iiná bá - paa tuwaqat'si pipeline, to transport water from Lake Powell to the areas identified in Subparagraphs 12.1.8, 12.1.9, and 12.1.10 on the Navajo Reservation, the Hopi Reservation, and the San Juan Southern Paiute Southern Area for municipal, domestic, commercial, and industrial Water Uses.

12.1.3 The federal funding for the iiná bá - paa tuwaqat'si pipeline is \$1.715 billion, which shall be funded by direct appropriations, and such other amounts as are authorized and required to complete the pipeline as provided in Section 13 of the Act. The total amount of obligations incurred by the Secretary in carrying out Subparagraph 12.1 shall be increased or decreased through indexing, as appropriate, based on ordinary fluctuations from January 1, 2024, in construction cost indices applicable to the types of construction involved in the design and construction of the iiná bá – paa tuwaqat'si pipeline.

12.1.4 The Secretary shall form a Project Construction Committee composed of representatives from Reclamation, the Bureau of Indian Affairs, the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe to participate in the planning and design of the iiná bá - paa tuwaqat'si pipeline. The iiná bá – paa tuwaqat'si pipeline shall be substantially configured as Alternative 5, Option B-100 described in the Reclamation Navajo-Hopi Value Planning Study – Arizona dated October 2020 (Value Planning Draft Report for Presentation (Not for Distribution)). The iiná bá - paa tuwaqat'si pipeline may

include components that have already been built or acquired by the Navajo Nation or the Hopi Tribe as a contribution by the Navajo Nation or the Hopi Tribe towards the cost of planning, designing, and constructing the pipeline. Construction of the iiná bá – paa tuwaqat’si pipeline shall commence after design, construction phasing, cost estimating, and value engineering have occurred and the phasing of construction has been agreed to among the Secretary, the Navajo Nation, and the Hopi Tribe, with the Secretary deciding on phasing if an agreement is not reached.

12.1.5 The Secretary, acting through the Commissioner of Reclamation, shall complete construction of the iiná bá - paa tuwaqat’si pipeline no later than December 31, 2040, or such later date as is agreed to by the Secretary, the Navajo Nation, and the Hopi Tribe.

12.1.6 All costs incurred by the Secretary in carrying out this Subparagraph 12.1 shall be nonreimbursable.

12.1.7 The iiná bá - paa tuwaqat’si pipeline shall include the planning, design, and construction of water intake facilities to transport Water into the pipeline from Lake Powell, as well as a water treatment plant, storage tanks, pumping stations, and electrical transmission equipment.

12.1.8 The iiná bá - paa tuwaqat’si pipeline is intended to serve the following areas and communities of the Navajo Reservation: LeChee, Coppermine, Bitter Springs, Cedar Ridge, Bodaway/Gap, Cameron, Grey Mountain, Coal Mine Mesa, and Tuba City.

12.1.9 The iiná bá - paa tuwaqat'si pipeline is intended to serve the following areas and communities of the Hopi Reservation: Moenkopi, Howell Mesa, First Mesa, Second Mesa, Third Mesa, and Keams Canyon.

12.1.10 The iiná bá - paa tuwaqat'si pipeline is intended to serve the San Juan Southern Paiute Southern Area in Arizona.

12.1.11 Prior to substantial completion of any phase of the iiná bá - paa tuwaqat'si pipeline that will provide Water to both the Navajo Nation and the Hopi Tribe, the Navajo Nation and the Hopi Tribe shall execute a project operations agreement, approved by the Secretary, that sets forth all terms and conditions necessary for long-term operations of the iiná bá - paa tuwaqat'si pipeline, including: (a) distribution of water; (b) responsibility for maintenance of the iiná bá - paa tuwaqat'si pipeline or section of the pipeline; (c) the allocation and payment of annual operation, maintenance and replacement costs of the iiná bá - paa tuwaqat'si pipeline or section of the pipeline based on the proportionate uses and ownership of the pipeline; and (d) a right to sue in United States District Court to enforce the operations agreement.

## **12.2 THE NAVAJO NATION WATER SETTLEMENT TRUST FUND**

Pursuant to section 10 of the Act, there is established a trust fund for the Navajo Nation to be known as the Navajo Nation Water Settlement Trust Fund to be managed, invested, and distributed by the Secretary and to remain available until expended, withdrawn, or reverted to the general fund of the Treasury, consisting of the amounts deposited in the Navajo Nation Water Settlement Trust Fund, together with any investment

earnings, including interest, earned on those amounts. The Secretary shall manage the Navajo Nation Water Settlement Trust Fund in accordance with the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. § 4001 *et seq.*). Established within the Navajo Nation Water Settlement Trust Fund are the following accounts: (a) the Navajo Nation Water Projects Trust Fund Account, (b) the Navajo Nation OM&R Trust Fund Account, (c) the Navajo Nation Renewable Energy Trust Fund Account, (d) the Navajo Nation Agricultural Water Conservation Trust Fund Account, and (e) the Navajo Nation Lower Basin Colorado River Water Acquisition Trust Fund Account, all of which are described below:

12.2.1 The Navajo Nation Water Projects Trust Fund Account.

The Navajo Nation Water Projects Trust Fund Account will be used to plan, design, construct, operate, and maintain water supply infrastructure including wells, water treatment facilities, pipelines, storage tanks, pumping stations, electrical transmission equipment, wastewater treatment facilities, and renewable energy facilities to serve Navajo communities. Federal funding required for the Navajo Nation Water Projects is \$2.3692 billion. The water projects are as follows:

12.2.1.1 The iiná bá - paa tuwaqat'si pipeline lateral is intended to provide potable Water to serve the community of LeChee and Antelope Point.

12.2.1.2 Southwest Navajo Regional Groundwater Project is intended to provide potable Water to the communities of: Leupp, Dilkon, Birdsprings, Indian Wells, Teesto, and Tolani Lake, and, subject to future Water Supply Contracts, may

interconnect to the Red Gap Ranch Regional Pipeline Project and obtain potable Water from the Red Gap Ranch Regional Pipeline Project at Points of Access;

12.2.1.3 Ganado Regional Groundwater Project is intended to provide potable Water to the communities of: Ganado, Steamboat, Cornfields, Kinlichee, and Jeddito;

12.2.1.4 Black Mesa Regional Groundwater Project is intended to transport potable Water to the communities of Black Mesa, Shonto, and Forest Lake;

12.2.1.5 Four Corners Project is intended to provide potable Water to the communities of Chinle and Many Farms;

12.2.1.6 Lupton Area Project is intended to provide potable Water to the communities of Lupton and Nahata Dziil;

12.2.1.7 Code Talker Lateral Extension Project is intended to provide potable Water to the communities of Ganado, Jeddito, Steamboat, Kinlichee, and Cornfields;

12.2.1.8 Kayenta Aquifer Storage and Recovery Project is intended to provide for the storage of water in the Navajo aquifer and the alluvial aquifer in Arizona or Utah with capacity to store 5,000 AFY of Water diverted near Halchita in Utah. This project is intended to serve Chilchinbeto, Dennehotso, Kayenta, Mexican Water, and Oljato; and

12.2.1.9 Local Upper Basin Water Projects are small local projects in the Upper Basin that are intended to provide Water infrastructure to Many Farms,

Nazlini, Kayenta, Chilchinbeto, Rough Rock, Sweetwater, Mexican Water, Rock Point, and Tsaile/Wheatfields.

12.2.2 The Navajo Nation OM&R Trust Fund Account.

The Navajo Nation will use the Navajo Nation OM&R Trust Fund Account to support the operation, maintenance, and replacement of the components of each of the projects described in Subparagraph 12.2. The amount of the Navajo Nation OM&R Trust Fund shall be \$229.5 million.

12.2.3 The Navajo Nation Renewable Energy Trust Fund Account.

The Navajo Nation Renewable Energy Trust Fund Account of \$40 million will provide funding for the development of renewable energy facilities to support the energy demands of the iiná bá - paa tuwaqat'si pipeline and the Navajo Nation water projects developed pursuant to Subparagraph 12.2.

12.2.4 The Navajo Nation Agricultural Conservation Trust Fund Account.

The Navajo Nation Agricultural Conservation Trust Fund Account will be used to reduce water shortages on land within the Navajo Reservation that was historically irrigated. The Navajo Nation Agricultural Conservation Trust Fund will be used for the implementation or repair of sprinklers, drip or other types of irrigation systems, land leveling, stream bank stabilization and restoration, pasture seeding, pasture management, fencing wind breaks, stockpounds, windmills, and wells. The federal funding for the Navajo Nation Agricultural Conservation Trust Fund Account is \$80 million. Up to half of the Navajo Nation Agricultural Conservation Trust Fund can be used for the replacement and

development of livestock wells and impoundments on the Navajo Nation Reservation and Trust Land.

#### 12.2.5 The Navajo Nation Lower Basin Colorado River Water Acquisition Trust Fund Account.

Pursuant to section 10 of the Act, there is established the Navajo Nation Lower Basin Colorado River Water Acquisition Trust Fund Account to provide \$28 million for the purchase of land and associated Lower Basin Colorado River water rights within the State..

#### 12.3 The Hopi Tribe Water Settlement Trust Fund.

Pursuant to section 11 of the Act, there is established a trust fund for the Hopi Tribe to be known as the Hopi Tribe Water Settlement Trust Fund to be managed, invested, and distributed by the Secretary and to remain available until expended, withdrawn, or reverted to the general fund of the Treasury, consisting of the amounts deposited in the Hopi Tribe Water Settlement Trust Fund, together with any investment earnings, including interest, earned on those amounts. The Secretary shall manage the Hopi Tribe Water Settlement Trust Fund in accordance with the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. § 4001 *et seq.*). Established within the Hopi Tribe Water Settlement Trust Fund are the following accounts: (a) the Hopi Tribe Groundwater Projects Trust Fund Account, (b) the Hopi Tribe OM&R Trust Fund Account, (c) the Hopi Tribe Agricultural Water Conservation Trust Fund Account, and (d) the Hopi Tribe Lower Basin Colorado River Water Acquisition Trust Fund Account, all of which are described below:

##### 12.3.1 The Hopi Tribe Groundwater Projects Trust Fund Account.

The Hopi Tribe Groundwater Projects Trust Fund Account will be used to plan, design, construct, operate, and maintain water supply infrastructure including wells, water treatment facilities, pipelines, storage tanks, pumping stations, electrical transmission equipment, wastewater treatment facilities, and renewable energy facilities to serve Hopi communities. Federal funding required for the Hopi Tribe Groundwater Projects is \$390 million. The Hopi Tribe Groundwater Projects are as follows:

12.3.1.1 The Side Rock-Moenkopi Groundwater Project. The Side Rock-Moenkopi Groundwater Project is intended to provide potable Water to Moenkopi and unserved locations on the Hopi Reservation.

12.3.1.2 The Expanded Hopi Arsenic Mitigation Project (HAMP). The HAMP is intended to provide potable Water to communities at First, Second, and Third Mesas and Keams Canyon.

12.3.2 The Hopi Tribe OM&R Trust Fund Account.

The Hopi Tribe will use the Hopi Tribe OM&R Trust Fund Account to support the operation, maintenance, and replacement of the components of each of the projects described in Subparagraph 12.3. The amount of the fund shall be \$87 million.

12.3.3 The Hopi Tribe Agricultural Conservation Trust Fund Account.

The Hopi Tribe Agricultural Conservation Trust Fund Account will be used to reduce water shortages on land within the Hopi Reservation that was historically irrigated and grazing land. The Fund will be used for the implementation or repair of sprinklers, drip or other types of irrigation systems, land leveling, stream bank stabilization and restoration, pasture seeding, pasture management, fencing, wind breaks, stockpounds, windmills and

wells, spring restoration, repair, replacement, and relocation of low technology structures to support Akchin farming, flood-water farming and other traditional farming practices, among other actions. The federal funding for the Hopi Tribe Agricultural Conservation Trust Fund Account is \$30 million.

#### 12.3.4 The Hopi Tribe Lower Basin Colorado River Water Acquisition Trust Fund Account.

Pursuant to section 11 of the Act, there is established the Hopi Tribe Lower Basin Colorado River Water Acquisition Trust Fund Account to provide \$1.5 million for the purchase of land and associated Lower Basin Colorado River water rights within the State.

#### 12.4 The San Juan Southern Paiute Tribe Water Settlement Trust Fund Account.

Pursuant to section 12 of the Act, there is established a trust fund for the San Juan Southern Paiute Tribe to be known as the San Juan Southern Paiute Tribe Water Settlement Trust Fund to be managed, invested, and distributed by the Secretary and to remain available until expended, withdrawn, or reverted to the general fund of the Treasury, consisting of the amounts deposited in the Trust Fund, together with any investment earnings, including interest, earned on those amounts. The Secretary shall manage the San Juan Southern Paiute Tribe Water Settlement Trust Fund in accordance with the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. § 4001 *et seq.*). Established within the San Juan Southern Paiute Tribe Water Settlement Trust Fund are the following accounts: (a) the San Juan Southern Paiute Tribe Groundwater Project Trust Fund Account, (b) the San Juan Southern Paiute Tribe OM&R Trust Fund Account, and (c)

the San Juan Southern Paiute Tribe Agricultural Water Conservation Trust Fund Account, all of which are described below:

12.4.1 The San Juan Southern Paiute Tribe Groundwater Project Trust Fund Account.

The San Juan Southern Paiute Tribe Groundwater Project Trust Fund Account will be used to plan, design, construct, operate, and maintain the San Juan Southern Paiute Tribe Groundwater Project, which shall include water treatment facilities, pipelines, storage tanks, pumping stations, electrical transmission equipment, wastewater treatment facilities, and renewable energy facilities. Federal funding required for the San Juan Southern Paiute Tribe Groundwater Projects is \$28 million.

12.4.2 The San Juan Southern Paiute Tribe OM&R Trust Fund Account.

The San Juan Southern Paiute Tribe will use the San Juan Southern Paiute Tribe OM&R Trust Fund Account to support the operation, maintenance, and replacement of the components of the groundwater project described in Subparagraph 12.4.1. The amount of the San Juan Southern Paiute Tribe OM&R Trust Fund shall be \$1.5 million.

12.4.3 The San Juan Southern Paiute Tribe Agricultural Conservation Trust Fund Account.

The San Juan Southern Paiute Tribe Agricultural Conservation Trust Fund Account will be used to reduce water shortages on the San Juan Southern Paiute Southern Area that was historically irrigated. This project includes the implementation or repair of sprinklers, drip or other types of irrigation systems, land leveling, pipelines, pumps and storage, stream bank stabilization and restoration, pasture seeding, pasture management, fencing, wind breaks, stockponds, windmills and wells, among other actions. The federal funding

for the San Juan Southern Paiute Tribe Agricultural Conservation Trust Fund Account is \$0.3 million. Up to half of San Juan Southern Paiute Tribe Agricultural Conservation Trust Fund Account can be used for the replacement and development of livestock wells and impoundments on the San Juan Southern Paiute Southern Area.

## **12.5 RIGHTS-OF-WAY AND CONSTRUCTION CORRIDORS**

### **12.5.1 Grants of Rights-of-Way Between the Tribes and the United States.**

12.5.1.1 Each Tribe shall timely consent to the grant of perpetual, non-exclusive rights-of-way to the United States, for purposes of coming upon and using land within the consenting Tribe's reservation to plan, design, construct, access, operate, maintain, modify, and replace: (a) the iiná bá - paa tuwaqat'si pipeline; and (b) any infrastructure reasonably necessary to operate said pipeline, at no cost to the United States. Upon transfer of ownership of the pipeline pursuant to section 8 of the Act, the Secretary shall also transfer that section of the right-of-way that lies on the Navajo Reservation between Moenkopi and the boundary of the 1882 Reservation to the Hopi Tribe.

12.5.1.2 The Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe shall: (a) each timely consent to the grant of perpetual, non-exclusive rights-of-way to the other Tribes, for purposes of coming upon and using land within the consenting Tribe's reservation to plan, design, construct, access, operate, maintain, modify, and replace (i) the Navajo Nation Water Projects, (ii) the Hopi Tribe Groundwater Projects, and (iii) the San Juan Southern Paiute Groundwater Project, and (iv) any infrastructure reasonably necessary to operate said projects, all in

furtherance of provision of water supplies to the Navajo Reservation, the Hopi Reservation, and the San Juan Southern Paiute Southern Area, without charge or other payment or consideration from the other Tribes, excepting surface damages; and (b) as the consenting Tribe, waive any right to tax, directly or indirectly, the right-of-way or infrastructure permitted by the immediately preceding clause (a) to be located in the right-of-way or related activities.

12.5.1.3 Except as expressly stated in Subparagraphs 12.5.1.1 and 12.5.1.2, the Tribes and the United States may not develop, use, or occupy the rights-of-way for any other purpose without the prior written approval of the consenting Tribe. The approval of the consenting Tribe for such purposes may be granted, granted upon conditions, or withheld in the sole discretion of the consenting Tribe. Except as expressly stated in Subparagraphs 12.5.1, 12.5.3, and 12.5.4, nothing in this Agreement shall be construed to affect or modify the rights or responsibilities of any Tribe with respect to: (a) claims to access or lack thereof across the reservation or lands of another Tribe; or (b) such rights of access as may exist under applicable law as of the Effective Date.

12.5.2 Construction Corridors or Other Consents by a Tribe to the United States.

Notwithstanding the provisions of Subparagraph 12.5.1, with the consent of each affected Tribe, the United States may enter into legal devices other than rights-of-way such as construction corridor agreements when operating within the jurisdiction of one of the Tribes in furtherance of the planning, design, and construction of the iiná bá - paa tuwaqat'si pipeline.

12.5.3 Side Rock-Moenkopi Groundwater Project Right-of-Way.

Notwithstanding Paragraph 14.0, and subject to the condition that the Hopi Tribe has consented to and the United States has granted the right-of-way described in Subparagraph 12.5.4, as of the Effective Date, the Navajo Nation: (a) hereby consents to the grant of a perpetual, non-exclusive right-of-way to the Hopi Tribe, for purposes of coming upon and using land within the Navajo Reservation along an alignment generally depicted in Exhibit 12.5.3, to plan, design, construct, access, operate, maintain, modify, and replace a water pipeline, and any infrastructure reasonably necessary to operate said pipeline, in furtherance of the Side Rock-Moenkopi Groundwater Project, without charge or other payment of consideration from the Hopi Tribe or the United States, excepting surface damages; and (b) waives any right to tax, directly or indirectly, the right-of-way or infrastructure permitted by the immediately preceding clause (a) to be located in the right-of-way or related activities. Except as expressly stated in the immediately preceding sentence, the Hopi Tribe may not develop, use, or occupy the right-of-way for any other purpose without the prior written approval of the Navajo Nation. The approval of the Navajo Nation required by the immediately preceding sentence may be granted, granted upon conditions, or withheld in the sole discretion of the Navajo Nation. Except as expressly stated in Subparagraphs 12.5.1, 12.5.3, or 12.5.4, nothing in this Agreement shall be construed to affect or modify the rights or responsibilities of the Navajo Nation or the Hopi Tribe with respect to: (a) claims to access or lack thereof across the reservation or lands of the other; or (b) such rights of access as may exist under applicable law as of the Effective Date.

12.5.4 NTUA (Questar) Right-of-Way.

Notwithstanding Paragraph 14.0, and subject to the condition that the Navajo Nation has consented to and the United States has granted the right-of-way described in Subparagraph 12.5.3, as of the Effective Date, the Hopi Tribe: (a) hereby consents to the grant of a perpetual, non-exclusive right-of-way to Navajo Nation Tribal Utility Authority, for purposes of coming upon and using land within the Hopi Reservation along an alignment generally depicted in Exhibit 12.5.4, to plan, design, construct, access, operate, maintain, modify, and replace a natural gas pipeline, and any infrastructure reasonably necessary to operate said pipeline, in furtherance of provision of natural gas supplies to the Navajo Reservation and the Hopi Reservation, without charge or other payment of consideration from the Navajo Nation or the United States, excepting surface damages; and (b) waives any right to tax, directly or indirectly, the right-of-way or infrastructure permitted by the immediately preceding clause (a) to be located in the right-of-way or related activities. Except as expressly stated in the immediately preceding sentence, Navajo Nation Tribal Utility Authority may not develop, use, or occupy the right-of-way for any other purpose without the prior written approval of the Hopi Tribe. The approval of the Hopi Tribe required by the immediately preceding sentence may be granted, granted upon conditions, or withheld in the sole discretion of the Hopi Tribe. Except as expressly stated in Subparagraphs 12.5.1, 12.5.3, or 12.5.4, nothing in this Agreement shall be construed to affect or modify the rights or responsibilities of the Navajo Nation or the Hopi Tribe with respect to: (a) claims to access or lack thereof across the reservation or lands of the other; or (b) such rights of access as may exist under applicable law as of the Effective Date.

#### 12.5.5 Taxes.

Without limiting the generality of the tax waivers set forth in Subparagraph 12.5.1, 12.5.3, and 12.5.4, the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe each covenants that it will not tax or assess, in any manner whatever, directly or indirectly, any rights, property or activity associated with the rights-of-way or other legal devices, infrastructure, and activities described in Subparagraphs 12.5.1, 12.5.2, 12.5.3, and 12.5.4.

### **12.6 FUTURE PROJECTS AMENDMENT**

The Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe may, within their individual discretion, determine that any or all of the projects identified in this Paragraph 12.0, except for the iiná bá - paa tuwaqat'si pipeline, should be amended to serve the Tribes' future needs for water on their respective reservations, utilizing the federal funds appropriated to each of the Tribes as set forth in this Paragraph 12.0 and in sections 10, 11, and 12 of the Act.

### **13.0 WAIVERS, RELEASES AND RETENTION OF CLAIMS**

#### **13.1 WAIVER, RELEASE, AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE NAVAJO NATION, ON BEHALF OF THE NAVAJO NATION AND THE MEMBERS OF THE NAVAJO NATION (BUT NOT MEMBERS IN THE CAPACITY OF THE MEMBERS AS NAVAJO ALLOTTEES), AND THE UNITED STATES, ACTING AS TRUSTEE FOR THE NAVAJO NATION AND THE MEMBERS OF THE NAVAJO NATION (BUT NOT MEMBERS IN THE CAPACITY OF THE MEMBERS AS NAVAJO ALLOTTEES)**

13.1.1 Except as provided in Subparagraph 13.1.3, the Navajo Nation, on behalf of the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), and the United States, acting as trustee for the

Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), as part of the performance of the respective obligations of the Navajo Nation and the United States under this Agreement and the Act, shall execute a waiver and release of all claims against the State (or any agency or political subdivision of the State), the Hopi Tribe, the Hopi Allottees, the San Juan Southern Paiute Tribe, and any other individual, entity, corporation, or municipal corporation under federal, State, or other law for all:

13.1.1.1 Past, present, and future claims for Water Rights, including rights to Colorado River Water, for Navajo Land, arising from time immemorial and, thereafter, forever;

13.1.1.2 Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Navajo Nation, the predecessors of the Navajo Nation, the Members of the Navajo Nation, or predecessors of the Members of the Navajo Nation;

13.1.1.3 Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for Navajo Land, arising from time immemorial through the Enforceability Date;

13.1.1.4 Past, present, and future claims for Injury to Water for Navajo Land, arising from time immemorial and, thereafter, forever;

13.1.1.5 Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Navajo Nation, the predecessors of the Navajo Nation, the Members of the Navajo Nation, or predecessors of the Members of the Navajo Nation;

13.1.1.6 Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, for Navajo Land, resulting from the Diversion or Use of Water outside of Navajo Land in a manner not in violation of this Agreement or State law; and

13.1.1.7 Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or the Act.

13.1.2 The waiver and release of claims described in Subparagraph 13.1.1 shall be in the form set forth in Exhibit 13.1 and shall take effect on the Enforceability Date.

13.1.3 Notwithstanding the waiver and release of claims described in Subparagraph 13.1.1 and Exhibit 13.1, the Navajo Nation, acting on behalf of the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), and the United States, acting as trustee for the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), shall retain any right:

13.1.3.1 To assert claims for injuries to, and seek enforcement of, the rights of the Navajo Nation under this Agreement, whether such rights are generally stated or specifically described, or the Act in any federal or State court of competent jurisdiction;

13.1.3.2 To assert claims for injuries to, and seek enforcement of, the rights of the Navajo Nation under the LCR Decree and the Gila River Adjudication Decree;

13.1.3.3 To assert claims for Water Rights for land owned or acquired by the Navajo Nation in fee, or held in trust by the United States for the benefit of the Navajo Nation, in the LCR Watershed pursuant to Subparagraphs 4.11, and 4.12, or in the Gila River Basin pursuant to Subparagraphs 4.14 and 4.15;

13.1.3.4 To object to any claims for Water Rights by or for: (i) any Indian Tribe other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe, other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; and

13.1.3.5 To assert past, present, or future claims for Injury to Water Rights against: (i) any Indian Tribe other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe, other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe.

**13.2 WAIVER, RELEASE, AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE UNITED STATES, ACTING AS TRUSTEE FOR THE NAVAJO ALLOTTEES**

13.2.1 Except as provided in Paragraph 13.2.3, the United States, acting as trustee for the Navajo Allottees, as part of the performance of the obligations of the United States under this Agreement and the Act, shall execute a waiver and release of all claims against the State (or any agency or political subdivision of the State), the Navajo Nation, the Hopi Tribe, the Hopi Allottees, and the San Juan Southern Paiute Tribe, and any other individual, entity, corporation, or municipal corporation under federal, State, or other law, for all:

13.2.1.1 Past, present, and future claims for Water Rights, including rights to Colorado River Water, for Navajo Allotments, arising from time immemorial and, thereafter, forever;

13.2.1.2 Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Navajo Allottees or predecessors of the Navajo Allottees;

13.2.1.3 Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for Navajo Allotments, arising from time immemorial through the Enforceability Date;

13.2.1.4 Past, present, and future claims for Injury to Water for Navajo Allotments, arising from time immemorial and, thereafter, forever;

13.2.1.5 Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and,

thereafter, forever, that are based on the aboriginal occupancy of land within the State by Navajo Allottees or predecessors of the Navajo Allottees;

13.2.1.6 Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, for the Navajo Allotments, resulting from the Diversion or Use of Water outside of Navajo Allotments in a manner not in violation of this Agreement or State law; and

13.2.1.7 Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or the Act.

13.2.2 The waiver and release of claims under Subparagraph 13.2.1 shall be in the form set forth in Exhibit 13.2 and shall take effect on the Enforceability Date.

13.2.3 Notwithstanding the waiver and release of claims described in Subparagraph 13.2.1 and Exhibit 13.2, the United States acting as trustee for the Navajo Allottees, shall retain any right:

13.2.3.1 To assert claims for injuries to, and seek enforcement of, the rights of the Navajo Allottees under this Agreement, whether such rights are generally stated or specifically described, or the Act in any federal or State court of competent jurisdiction;

13.2.3.2 To assert claims for injuries to, and seek enforcement of, the rights of the Navajo Allottees under the LCR Decree;

13.2.3.3 To object to any claims for Water Rights by or for: (i) any Indian Tribe other than the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe other than the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; and

13.2.3.4 To assert past, present, or future claims for Injury to Water Rights against: (i) any Indian Tribe other than the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe other than the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe.

**13.3 WAIVER, RELEASE AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE NAVAJO NATION, ON BEHALF OF THE NAVAJO NATION AND THE MEMBERS OF THE NAVAJO NATION (BUT NOT MEMBERS IN THE CAPACITY OF THE MEMBERS AS NAVAJO ALLOTTEES), AGAINST THE UNITED STATES**

13.3.1 Except as provided in Subparagraph 13.3.3, the Navajo Nation, acting on behalf of the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), as part of the performance of the obligations of the Navajo Nation under this Agreement and the Act, shall execute a waiver and release of all claims against the United States, including agencies, officials, and employees of the United States, under federal, State, or other law for all:

13.3.1.1 Past, present, and future claims for Water Rights, including rights to Colorado River Water, for Navajo Land, arising from time immemorial and, thereafter, forever:

13.3.1.2 Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Navajo Nation, the predecessors of the Navajo Nation, the Members of the Navajo Nation, or predecessors of the Members of the Navajo Nation;

13.3.1.3 Claims for Water Rights within the State that the United States, acting as trustee for the Navajo Nation and Navajo Allottees, asserted or could have asserted in any proceeding, except to the extent that such rights are recognized as part of the Navajo Nation's Water Rights under the Act.

13.3.1.4 Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for Navajo Land, arising from time immemorial through the Enforceability Date;

13.3.1.5 Past, present, and future claims for Injury to Water for Navajo Land, arising from time immemorial and, thereafter, forever;

13.3.1.6 Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Navajo Nation, the predecessors of the Navajo Nation, the Members of the Navajo Nation, or predecessors of the Members of the Navajo Nation;

13.3.1.7 Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date for Navajo Land, resulting from the Diversion or Use of Water outside of Navajo Land in a manner not in violation of this Agreement or State law;

13.3.1.8 Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or the Act;

13.3.1.9 Past, present, and future claims arising out of, or relating in any manner to, United States Geological Survey monitoring and reporting activities described in Paragraph 7.0;

13.3.1.10 Past, present, and future claims arising from time immemorial and, thereafter, forever, relating in any manner to Injury to Water or Injury to Water Rights based on the provisions of Paragraphs 8.0 and 9.0;

13.3.1.11 Past and Present claims for foregone benefits from non-Navajo Use of Water, on and off Navajo Land (including Water from all sources and for all Uses), within the State arising before the Enforceability Date;

13.3.1.12 Past and Present claims for damage, loss, or injury to land or natural resources due to loss of Water or Water Rights, including damages, losses, or injuries to hunting, fishing, gathering, or cultural rights due to loss of Water or Water Rights, claims relating to interference with, Diversion of, or taking of Water, or claims relating to a failure to protect, acquire, replace, or develop Water, Water

Rights, or Water infrastructure, within the State, arising before the Enforceability Date;

13.3.1.13 Past and Present claims arising before the Enforceability Date from a failure to provide for operation, maintenance, or deferred maintenance for any irrigation system or irrigation project on Navajo Land;

13.3.1.14 Past and Present claims arising before the Enforceability Date from a failure to establish or provide a municipal, rural, or industrial Water delivery system on Navajo Land;

13.3.1.15 Past and Present claims for damage, loss, or injury to land or natural resources due to construction, operation, and management of irrigation projects on Navajo Land, including damages, losses, or injuries to fish habitat, wildlife, and wildlife habitat, within the State arising before the Enforceability Date; and

13.3.1.16 Past and Present claims arising before the Enforceability Date from a failure to provide a dam safety improvement to a dam on Navajo Land within the State.

13.3.2 The waiver and release of claims described in Subparagraph 13.3.1 shall be in the form set forth in Exhibit 13.3 and shall take effect on the Enforceability Date.

13.3.3 Notwithstanding the waiver and release of claims described in Subparagraph 13.3.1 and Exhibit 13.3, the Navajo Nation, acting on behalf of the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), shall retain any right:

13.3.3.1 To assert claims for injuries to, and seek enforcement of, the rights of the Navajo Nation under this Agreement, whether such rights are generally stated or specifically described, or the Act in any federal or State court of competent jurisdiction;

13.3.3.2 To assert claims for injuries to, and seek enforcement of, the rights of the Navajo Nation under the LCR Decree and the Gila River Adjudication Decree;

13.3.3.3 To assert claims for Water Rights for land owned or acquired by the Navajo Nation in fee in the LCR Watershed pursuant to Subparagraphs 4.11 and 4.12, or in the Verde River Subwatershed pursuant to Subparagraphs 4.14 and 4.15;

13.3.3.4 To object to any claims for Water Rights by or for: (i) any Indian Tribe other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe or (ii) the United States acting on behalf of any Indian Tribe other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; and

13.3.3.5 To assert past, present, or future claims for Injury to Water Rights against: (i) any Indian Tribe other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe.

**13.4 WAIVER, RELEASE, AND RETENTION OF CLAIMS BY THE UNITED STATES IN ALL CAPACITIES (EXCEPT AS TRUSTEE FOR AN INDIAN TRIBE OTHER THAN THE NAVAJO NATION, THE HOPI TRIBE AND THE SAN JUAN SOUTHERN PAIUTE TRIBE) AGAINST THE NAVAJO NATION AND THE MEMBERS OF THE NAVAJO NATION**

13.4.1 Except as provided in Subparagraph 13.4.3, the United States, in all capacities (except as trustee for an Indian Tribe other than the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe), as part of the performance of the obligations of the United States under this Agreement and the Act, shall execute a waiver and release of all claims against the Navajo Nation, the Members of the Navajo Nation, or any agency, official, or employee of the Navajo Nation, under federal, State, or any other law for all:

13.4.1.1 Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, resulting from the Diversion or Use of Water on Navajo Land, arising from time immemorial through the Enforceability Date;

13.4.1.2 Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, resulting from the Diversion or Use of Water on Navajo Land in a manner that is not in violation of this Agreement or State law; and

13.4.1.3 Past, present, and future claims arising out of, or related in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or the Act.

13.4.2 The waiver and release of claims under Subparagraph 13.4.1 shall be in the form set forth in Exhibit 13.4 and shall take effect on the Enforceability Date.

13.4.3 Notwithstanding the waiver and release of claims described in Subparagraph 13.4.1 and Exhibit 13.4, the United States shall retain any right to assert any claim not

expressly waived in accordance with that Subparagraph and that Exhibit, in any federal or State court of competent jurisdiction.

**13.5 WAIVER, RELEASE, AND RETENTION OF CLAIMS BY PARTIES, OTHER THAN THE NAVAJO NATION ON BEHALF OF THE NAVAJO NATION AND THE MEMBERS OF THE NAVAJO NATION, AND THE UNITED STATES ACTING AS TRUSTEE FOR THE NAVAJO NATION, THE MEMBERS OF THE NAVAJO NATION AND THE NAVAJO ALLOTTEES**

13.5.1 For purposes of this Subparagraph 13.5, the term “Parties” shall mean the Parties, except: (a) the Navajo Nation on behalf of the Navajo Nation and the Members of the Navajo Nation; (b) the United States, acting as trustee for the Navajo Nation, the Members of the Navajo Nation, and the Navajo Allottees; (c) the Hopi Tribe on behalf of the Hopi Tribe and the Members of the Hopi Tribe; (d) the United States acting as trustee for the Hopi Tribe, the Members of the Hopi Tribe, and the Hopi Allottees; (e) the San Juan Southern Paiute Tribe on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe; and (f) the United States acting in its capacity as trustee for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe.

13.5.2 Except as provided in Subparagraph 13.5.4, the Parties shall execute a waiver and release of all claims against the Navajo Nation, the Members of the Navajo Nation, the Navajo Allottees, the United States, acting as trustee for the Navajo Nation, the Members of the Navajo Nation, and the Navajo Allottees, under federal, State, or other law for all:

13.5.2.1 Past and present claims for Injury to Water Rights resulting from the Diversion or Use of Water on Navajo Land and the Navajo Allotments, arising from time immemorial through the Enforceability Date;

13.5.2.2 Claims for Injury to Water Rights arising after the Enforceability Date resulting from the Diversion or Use of Water on or for Navajo Land and the Navajo Allotments in a manner not in violation of this Agreement or State law; and

13.5.2.3 Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or the Act.

13.5.3 The waiver and release of claims described in Subparagraph 13.5.2 shall be in the form set forth in Exhibit 13.5 and shall take effect on the Enforceability Date.

13.5.4 Notwithstanding the waiver and release of claims described in Subparagraph 13.5.2 and Exhibit 13.5, the Parties shall retain any right:

13.5.4.1 To assert claims for injuries to, and seek enforcement of, their rights under this Agreement or the Act in any State or federal court of competent jurisdiction;

13.5.4.2 To assert claims for injuries to, and seek enforcement of, their rights under any judgment and decree entered by the court in the LCR Adjudication Proceedings and any judgment or decree entered by the court in the Gila River Adjudication Proceedings;

13.5.4.3 To assert past, present, and future claims to Water, including Colorado River Water, that are not inconsistent with this Agreement; and

13.5.4.4 To assert any claims arising after the Enforceability Date for Injury to Water Rights not specifically waived herein.

**13.6 WAIVER, RELEASE, AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE HOPI TRIBE, ON BEHALF OF THE HOPI TRIBE AND THE MEMBERS OF THE HOPI TRIBE (BUT NOT MEMBERS IN THE CAPACITY OF THE MEMBERS AS HOPI ALLOTTEES), AND THE UNITED STATES, ACTING AS TRUSTEE FOR THE HOPI TRIBE AND THE MEMBERS OF THE HOPI TRIBE (BUT NOT MEMBERS IN THE CAPACITY OF THE MEMBERS AS HOPI ALLOTTEES)**

13.6.1 Except as provided in Subparagraph 13.6.3, the Hopi Tribe, on behalf of the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), and the United States, acting as trustee for the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), as part of the performance of the respective obligations of the Hopi Tribe and the United States under this Agreement and the Act, shall execute a waiver and release of all claims against the State (or any agency or political subdivision of the State), the Navajo Nation, the Navajo Allottees, the San Juan Southern Paiute Tribe, and any other individual, entity, corporation, or municipal corporation under federal, State, or other law for all:

13.6.1.1 Past, present, and future claims for Water Rights, including rights to Colorado River Water, for Hopi Land, arising from time immemorial and, thereafter, forever;

13.6.1.2 Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are

based on the aboriginal occupancy of land within the State by the Hopi Tribe, the predecessors of the Hopi Tribe, the Members of the Hopi Tribe, or predecessors of the Members of the Hopi Tribe;

13.6.1.3 Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for Hopi Land, arising from time immemorial through the Enforceability Date;

13.6.1.4 Past, present, and future claims for Injury to Water for Hopi Land, arising from time immemorial and, thereafter, forever;

13.6.1.5 Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Hopi Tribe, the predecessors of the Hopi Tribe, the Members of the Hopi Tribe, or predecessors of the Members of the Hopi Tribe;

13.6.1.6 Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, for Hopi Land, resulting from the Diversion or Use of Water outside of Hopi Land in a manner not in violation of this Agreement or State law; and

13.6.1.7 Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or the Act.

13.6.2 The waiver and release of claims described in Subparagraph 13.6.1 shall be in the form set forth in Exhibit 13.6 and shall take effect on the Enforceability Date.

13.6.3 Notwithstanding the waiver and release of claims described in Subparagraph 13.6.1 and Exhibit 13.6, the Hopi Tribe, acting on behalf of the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), and the United States, acting as trustee for the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), shall retain any right:

13.6.3.1 To assert claims for injuries to, and seek enforcement of, the rights of the Hopi Tribe under this Agreement, whether such rights are generally stated or specifically described, or the Act in any federal or State court of competent jurisdiction;

13.6.3.2 To assert claims for injuries to, and seek enforcement of, the rights of the Hopi Tribe under the LCR Decree;

13.6.3.3 To assert claims for Water Rights for land owned or acquired by the Hopi Tribe in fee, or held in trust by the United States for the benefit of the Hopi Tribe, in the LCR Watershed pursuant to Subparagraphs 5.10 and 5.11;

13.6.3.4 To object to any claims for Water Rights by or for: (i) any Indian Tribe other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe, other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; and

13.6.3.5 To assert past, present, or future claims for Injury to Water Rights against: (i) any Indian Tribe other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe, other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe.

**13.7 WAIVER, RELEASE, AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE UNITED STATES, ACTING AS TRUSTEE FOR THE HOPI ALLOTTEES**

13.7.1 Except as provided in Paragraph 13.7.3, the United States, acting as trustee for the Hopi Allottees, as part of the performance of the obligations of the United States under this Agreement and the Act, shall execute a waiver and release of all claims against the State (or any agency or political subdivision of the State), the Hopi Tribe, the Navajo Nation, the Navajo Allottees, and the San Juan Southern Paiute Tribe, and any other individual, entity, corporation, or municipal corporation under federal, State, or other law, for all:

13.7.1.1 Past, present, and future claims for Water Rights, including rights to Colorado River Water, for Hopi Allotments, arising from time immemorial, and, thereafter, forever;

13.7.1.2 Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Hopi Allottees or predecessors of the Hopi Allottees;

13.7.1.3 Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for Hopi Allotments, arising from time immemorial through the Enforceability Date;

13.7.1.4 Past, present, and future claims for Injury to Water for Hopi Allotments, arising from time immemorial and, thereafter, forever;

13.7.1.5 Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by Hopi Allottees or predecessors of the Hopi Allottees;

13.7.1.6 Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, for the Hopi Allotments, resulting from the Diversion or Use of Water outside of the Hopi Allotments in a manner not in violation of this Agreement or State law; and

13.7.1.7 Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or the Act.

13.7.2 The waiver and release of claims under Subparagraph 13.7.1 shall be in the form set forth in Exhibit 13.7 and shall take effect on the Enforceability Date.

13.7.3 Notwithstanding the waiver and release of claims described in Subparagraph 13.7.1 and Exhibit 13.7, the United States acting as trustee for the Hopi Allottees, shall retain any right:

13.7.3.1 To assert claims for injuries to, and seek enforcement of, the rights of the Hopi Allottees under this Agreement, whether such rights are generally stated or specifically described, or the Act in any federal or State court of competent jurisdiction;

13.7.3.2 To assert claims for injuries to, and seek enforcement of, the rights of the Hopi Allottees under the LCR Decree;

13.7.3.3 To object to any claims for Water Rights by or for: (i) any Indian Tribe other than the Hopi Tribe, the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe other than the Hopi Tribe, the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; and

13.7.3.4 To assert past, present, or future claims for Injury to Water Rights against: (i) any Indian Tribe other than the Hopi Tribe, the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe other than the Hopi Tribe, the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe.

**13.8 WAIVER, RELEASE, AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE HOPI TRIBE, ON BEHALF OF THE HOPI**

**TRIBE AND THE MEMBERS OF THE HOPI TRIBE (BUT NOT MEMBERS IN THE CAPACITY OF THE MEMBERS AS HOPI ALLOTTEES), AGAINST THE UNITED STATES**

13.8.1 Except as provided in Subparagraph 13.8.3, the Hopi Tribe, acting on behalf of the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), as part of the performance of the obligations of the Hopi Tribe under this Agreement and the Act, shall execute a waiver and release of all claims against the United States, including agencies, officials, and employees of the United States, under federal, State, or other law for all:

13.8.1.1 Past, present, and future claims for Water Rights, including rights to Colorado River Water, for Hopi Land, arising from time immemorial and, thereafter, forever:

13.8.1.2 Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Hopi Tribe, the predecessors of the Hopi Tribe, the Members of the Hopi Tribe, or predecessors of the Members of the Hopi Tribe;

13.8.1.3 Claims for Water Rights within the State that the United States, acting a trustee for the Hopi Tribe and Hopi Allottees, asserted or could have asserted in any proceeding, except to the extent that such rights are recognized as part of the Hopi Tribe's Water Rights under the Act.

13.8.1.4 Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for Hopi Land, arising from time immemorial through the Enforceability Date;

13.8.1.5 Past, present, and future claims for Injury to Water for Hopi Land, arising from time immemorial and, thereafter, forever;

13.8.1.6 Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Hopi Tribe, the predecessors of the Hopi Tribe, the Members of the Hopi Tribe, or predecessors of the Members of the Hopi Tribe;

13.8.1.7 Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date for Hopi Land, resulting from the Diversion or Use of Water outside of Hopi Land in a manner not in violation of this Agreement or State law;

13.8.1.8 Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or the Act;

13.8.1.9 Past, present, and future claims arising out of, or relating in any manner to, United States Geological Survey monitoring and reporting activities described in Paragraph 7.0;

13.8.1.10 Past, present, and future claims arising from time immemorial and, thereafter, forever, relating in any manner to Injury to Water or Injury to Water Rights based on the provisions of Paragraphs 8.0 and 9.0;

13.8.1.11 Past and Present claims for foregone benefits from non-Hopi Use of Water, on and off Hopi Land (including Water from all sources and for all Uses), within the State arising before the Enforceability Date;

13.8.1.12 Past and Present claims for damage, loss, or injury to land, or natural resources due to loss of Water or Water Rights, including damages, losses, or injuries to hunting, fishing, gathering, or cultural rights due to loss of Water or Water Rights, claims relating to interference with, Diversion of, or taking of Water, or claims relating to a failure to protect, acquire, replace, or develop Water, Water Rights, or Water infrastructure, within the State, arising before the Enforceability Date;

13.8.1.13 Past and Present claims arising before the Enforceability Date from a failure to provide for operation, maintenance, or deferred maintenance for any irrigation system or irrigation project on Hopi Land;

13.8.1.14 Past and Present claims arising before the Enforceability Date from a failure to establish or provide a municipal, rural, or industrial Water delivery system on Hopi Land; and

13.8.1.15 Past and Present claims for damage, loss, or injury to land or natural resources due to construction, operation, and management of irrigation projects on

Hopi Land, including damages, losses, or injuries to fish habitat, wildlife, and wildlife habitat, within the State arising before the Enforceability Date.

13.8.2 The waiver and release of claims described in Subparagraph 13.8.1 shall be in the form set forth in Exhibit 13.8 and shall take effect on the Enforceability Date.

13.8.3 Notwithstanding the waiver and release of claims described in Subparagraph 13.8.1 and Exhibit 13.8, the Hopi Tribe, acting on behalf of the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), shall retain any right:

13.8.3.1 To assert claims for injuries to, and seek enforcement of, the rights of the Hopi Tribe under this Agreement, whether such rights are generally stated or specifically described, or the Act, in any federal or State court of competent jurisdiction;

13.8.3.2 To assert claims for injuries to, and seek enforcement of, the rights of the Hopi Tribe under the LCR Decree;

13.8.3.3 To assert claims for Water Rights for land owned or acquired by the Hopi Tribe in fee in the LCR Watershed pursuant to Subparagraphs 5.10 and 5.11;

13.8.3.4 To object to any claims for Water Rights by or for: (i) any Indian Tribe other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; and

13.8.3.5 To assert past, present, or future claims for Injury to Water Rights against: (i) any Indian Tribe other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe.

**13.9 WAIVER, RELEASE, AND RETENTION OF CLAIMS BY THE UNITED STATES IN ALL CAPACITIES (EXCEPT AS TRUSTEE FOR AN INDIAN TRIBE OTHER THAN THE NAVAJO NATION, THE HOPI TRIBE, AND THE SAN JUAN SOUTHERN PAIUTE TRIBE) AGAINST THE HOPI TRIBE AND THE MEMBERS OF THE HOPI TRIBE**

13.9.1 Except as provided in Subparagraph 13.9.3, the United States, in all capacities (except as trustee for an Indian Tribe other than the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe), as part of the performance of the obligations of the United States under this Agreement and the Act, shall execute a waiver and release of all claims against the Hopi Tribe, the Members of the Hopi Tribe, or any agency, official, or employee of the Hopi Tribe, under federal, State, or any other law for all:

13.9.1.1 Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, resulting from the Diversion or Use of Water on Hopi Land arising from time immemorial through the Enforceability Date;

13.9.1.2 Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, resulting from the Diversion or Use of Water on Hopi Land in a manner that is not in violation of this Agreement or State law; and

13.9.1.3 Past, present, and future claims arising out of, or related in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or the Act.

13.9.2 The waiver and release of claims under Subparagraph 13.9.1 shall be in the form set forth in Exhibit 13.9 and shall take effect on the Enforceability Date.

13.9.3 Notwithstanding the waiver and release of claims described in Subparagraph 13.9.1 and Exhibit 13.9, the United States shall retain any right to assert any claim not expressly waived in accordance with that Subparagraph and that Exhibit, in any federal or State court of competent jurisdiction.

**13.10 WAIVER, RELEASE, AND RETENTION OF CLAIMS BY THE PARTIES, OTHER THAN THE HOPI TRIBE ON BEHALF OF THE HOPI TRIBE AND THE MEMBERS OF THE HOPI TRIBE, AND THE UNITED STATES ACTING AS TRUSTEE FOR THE HOPI TRIBE, THE MEMBERS OF THE HOPI TRIBE AND THE HOPI ALLOTTEES**

13.10.1 For purposes of this Subparagraph 13.10, the term “Parties” shall mean the Parties, except: (a) the Navajo Nation on behalf of the Navajo Nation and the Members of the Navajo Nation; (b) the United States, acting as trustee for the Navajo Nation, the Members of the Navajo Nation, and the Navajo Allottees; (c) the Hopi Tribe on behalf of the Hopi Tribe and the Members of the Hopi Tribe; (d) the United States acting as trustee for the Hopi Tribe, the Members of the Hopi Tribe, and the Hopi Allottees; (e) the San Juan Southern Paiute Tribe on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe; and (f) the United States acting in its capacity as trustee for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe.

13.10.2 Except as provided in Subparagraph 13.10.4, the Parties shall execute a waiver and release of all claims against the Hopi Tribe, the Members of the Hopi Tribe, the Hopi Allottees, and the United States, acting as trustee for the Hopi Tribe, the Members of the Hopi Tribe, and the Hopi Allottees, under federal, State, or other law for all:

13.10.2.1 Past and present claims for Injury to Water Rights resulting from the Diversion or Use of Water on Hopi Land and the Hopi Allotments, arising from time immemorial through the Enforceability Date;

13.10.2.2 Claims for Injury to Water Rights arising after the Enforceability Date resulting from the Diversion or Use of Water on or for Hopi Land and the Hopi Allotments in a manner not in violation of this Agreement or State law; and

13.10.2.3 Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or the Act.

13.10.3 The waiver and release of claims described in Subparagraph 13.10.2 shall be in the form set forth in Exhibit 13.10 and shall take effect on the Enforceability Date.

13.10.4 Notwithstanding the waiver and release of claims described in Subparagraph 13.10.2 and Exhibit 13.10, the Parties shall retain any right:

13.10.4.1 To assert claims for injuries to, and seek enforcement of, their rights under this Agreement or the Act in any State or federal court of competent jurisdiction;

13.10.4.2 To assert claims for injuries to, and seek enforcement of, their rights under any judgment and decree entered by the court in the LCR Adjudication Proceedings;

13.10.4.3 To assert past, present, and future claims to Water, including Colorado River Water, that are not inconsistent with this Agreement; and

13.10.4.4 To assert any claims arising after the Enforceability Date for Injury to Water Rights not specifically waived herein.

**13.11 WAIVER, RELEASE, AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE SAN JUAN SOUTHERN PAIUTE TRIBE, ON BEHALF OF THE SAN JUAN SOUTHERN PAIUTE TRIBE AND THE MEMBERS OF THE SAN JUAN SOUTHERN PAIUTE TRIBE, AND THE UNITED STATES, ACTING AS TRUSTEE FOR THE SAN JUAN SOUTHERN PAIUTE TRIBE AND THE MEMBERS OF THE SAN JUAN SOUTHERN PAIUTE TRIBE**

13.11.1 Except as provided in Subparagraph 13.11.3, the San Juan Southern Paiute Tribe, on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, and the United States, acting as trustee for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, as part of the performance of the respective obligations of the San Juan Southern Paiute Tribe and the United States under this Agreement and the Act, shall execute a waiver and release of all claims against the State (or any agency or political subdivision of the State), the Hopi Tribe, the Hopi Allottees, the Navajo Nation, the Navajo Allottees, and any other individual, entity, corporation, or municipal corporation under federal, State, or other law for all:

13.11.1.1 Past, present, and future claims for Water Rights, including rights to Colorado River Water, for San Juan Southern Paiute Land, arising from time immemorial and, thereafter, forever;

13.11.1.2 Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the San Juan Southern Paiute Tribe, the predecessors of the San Juan Southern Paiute Tribe, the Members of the San Juan Southern Paiute Tribe, or predecessors of the Members of the San Juan Southern Paiute Tribe;

13.11.1.3 Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for San Juan Southern Paiute Land, arising from time immemorial through the Enforceability Date;

13.11.1.4 Past, present, and future claims for Injury to Water for San Juan Southern Paiute Land, arising from time immemorial and, thereafter, forever;

13.11.1.5 Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the San Juan Southern Paiute Tribe, the predecessors of the San Juan Southern Paiute Tribe, the Members of the San Juan Southern Paiute Tribe, or predecessors of the Members of the San Juan Southern Paiute Tribe;

13.11.1.6 Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, for San Juan Southern Paiute Land, resulting from the Diversion or Use of Water outside of San Juan Southern Paiute Land in a manner not in violation of this Agreement or State law; and

13.11.1.7 Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or the Act.

13.11.2 The waiver and release of claims described in Subparagraph 13.11.1 shall be in the form set forth in Exhibit 13.11 and shall take effect on the Enforceability Date.

13.11.3 Notwithstanding the waiver and release of claims described in Subparagraph 13.11.1 and Exhibit 13.11, the San Juan Southern Paiute Tribe, acting on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, and the United States, acting as trustee for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, shall retain any right:

13.11.3.1 To assert claims for injuries to, and seek enforcement of, the rights of the San Juan Southern Paiute Tribe under this Agreement, whether such rights are generally stated or specifically described, or the Act in any federal or State court of competent jurisdiction;

13.11.3.2 To assert claims for injuries to, and seek enforcement of, the rights of the San Juan Southern Paiute Tribe under the LCR Decree;

13.11.3.3 To assert claims for Water Rights for land owned or acquired by the San Juan Southern Paiute Tribe in fee or held in trust by the United States for the benefit of the San Juan Southern Paiute Tribe in the LCR Watershed pursuant to Subparagraphs 6.4 and 6.5;

13.11.3.4 To object to any claims for Water Rights by or for: (i) any Indian Tribe other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe, other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe; and

13.11.3.5 To assert past, present, or future claims for Injury to Water Rights against: (i) any Indian Tribe other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe, other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe.

**13.12 WAIVER, RELEASE, AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE SAN JUAN SOUTHERN PAIUTE TRIBE, ON BEHALF OF THE SAN JUAN SOUTHERN PAIUTE TRIBE AND THE MEMBERS OF THE SAN JUAN SOUTHERN PAIUTE TRIBE, AGAINST THE UNITED STATES**

13.12.1 Except as provided in Subparagraph 13.12.3, the San Juan Southern Paiute Tribe, acting on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, as part of the performance of the obligations of the San Juan Southern Paiute Tribe under this Agreement and the Act, shall execute a waiver and release of all claims against the United States, including agencies, officials, and employees of the United States, under federal, State, or other law for all:

13.12.1.1 Past, present, and future claims for Water Rights, including rights to Colorado River Water, for San Juan Southern Paiute Land, arising from time immemorial and, thereafter, forever:

13.12.1.2 Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the San Juan Southern Paiute Tribe, the predecessors of the San Juan Southern Paiute Tribe, the Members of the San Juan Southern Paiute Tribe, or predecessors of the Members of the San Juan Southern Paiute Tribe;

13.12.1.3 Claims for Water Rights within the State that the United States, acting as trustee for the San Juan Southern Paiute Tribe, asserted or could have asserted in any proceeding, except to the extent that such rights are recognized as part of the San Juan Southern Paiute Tribe's Water Rights under the Act.

13.12.1.4 Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for San Juan Southern Paiute Land, arising from time immemorial through the Enforceability Date;

13.12.1.5 Past, present, and future claims for Injury to Water for San Juan Southern Paiute Land, arising from time immemorial and, thereafter, forever;

13.12.1.6 Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the San Juan Southern Paiute Tribe, the predecessors of the San Juan

Southern Paiute Tribe, the Members of the San Juan Southern Paiute Tribe, or predecessors of the Members of the San Juan Southern Paiute Tribe;

13.12.1.7 Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date for San Juan Southern Paiute Land, resulting from the Diversion or Use of Water outside of San Juan Southern Paiute Land in a manner not in violation of this Agreement or State law;

13.12.1.8 Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or the Act;

13.12.1.9 Past, present, and future claims arising from time immemorial and, thereafter, forever, relating in any manner to Injury to Water or Injury to Water Rights based on the provisions of Paragraphs 8.0 and 9.0;

13.12.1.10 Past and Present claims for foregone benefits from non-San Juan Southern Paiute Tribe Use of Water, on and off San Juan Southern Paiute Land (including Water from all sources and for all Uses), within the State arising before the Enforceability Date;

13.12.1.11 Past and Present claims for damage, loss, or injury to land, or natural resources due to loss of Water or Water Rights, including damages, losses, or injuries to hunting, fishing, gathering, or cultural rights due to loss of Water or Water Rights, claims relating to interference with, Diversion of, or taking of Water, or claims relating to a failure to protect, acquire, replace, or develop Water, Water

Rights, or Water infrastructure, within the State, arising before the Enforceability Date;

13.12.1.12 Past and Present claims arising before the Enforceability Date from a failure to provide for operation, maintenance, or deferred maintenance for any irrigation system or irrigation project on San Juan Southern Paiute Land;

13.12.1.13 Past and Present claims arising before the Enforceability Date from a failure to establish or provide a municipal, rural, or industrial Water delivery system on San Juan Southern Paiute Land; and

13.12.1.14 Past and Present claims for damage, loss, or injury to land or natural resources due to construction, operation, and management of irrigation projects on San Juan Southern Paiute Land, including damages, losses, or injuries to fish habitat, wildlife, and wildlife habitat, within the State arising before the Enforceability Date.

13.12.2 The waiver and release of claims described in Subparagraph 13.12.1 shall be in the form set forth in Exhibit 13.12 and shall take effect on the Enforceability Date.

13.12.3 Notwithstanding the waiver and release of claims described in Subparagraph 13.12.1 and Exhibit 13.12, the San Juan Southern Paiute Tribe, acting on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, shall retain any right:

13.12.3.1 To assert claims for injuries to, and seek enforcement of, the rights of the San Juan Southern Paiute Tribe under this Agreement, whether such rights are

generally stated or specifically described, or the Act in any federal or State court of competent jurisdiction;

13.12.3.2 To assert claims for injuries to, and seek enforcement of, the rights of the San Juan Southern Paiute Tribe under the LCR Decree;

13.12.3.3 To assert claims for Water Rights for land owned or acquired by the San Juan Southern Paiute Tribe in fee in the LCR Watershed pursuant to Subparagraphs 6.4 and 6.5;

13.12.3.4 To object to any claims for Water Rights by or for: (i) any Indian Tribe other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe, other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe; and

13.12.3.5 To assert past, present, or future claims for Injury to Water Rights against: (i) any Indian Tribe other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe, other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe;

**13.13 WAIVER, RELEASE, AND RETENTION OF CLAIMS BY THE UNITED STATES IN ALL CAPACITIES (EXCEPT AS TRUSTEE FOR AN INDIAN TRIBE OTHER THAN THE NAVAJO NATION, THE HOPI TRIBE AND THE SAN JUAN SOUTHERN PAIUTE TRIBE) AGAINST THE SAN JUAN SOUTHERN PAIUTE TRIBE AND THE MEMBERS OF THE SAN JUAN SOUTHERN PAIUTE TRIBE**

13.13.1 Except as provided in Subparagraph 13.13.3, the United States, in all capacities (except as trustee for an Indian Tribe other than the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe), as part of the performance of the

obligations of the United States under this Agreement and the Act, shall execute a waiver and release of all claims against the San Juan Southern Paiute Tribe, the Members of the San Juan Southern Paiute Tribe, or any agency, official, or employee of the San Juan Southern Paiute Tribe, under federal, State, or any other law for all:

13.13.1.1 Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, resulting from the Diversion or Use of Water on San Juan Southern Paiute Land arising from time immemorial through the Enforceability Date;

13.13.1.2 Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, resulting from the Diversion or Use of Water on San Juan Southern Paiute Land in a manner that is not in violation of this Agreement or State law; and

13.13.1.3 Past, present, and future claims arising out of, or related in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or the Act.

13.13.2 The waiver and release of claims under Subparagraph 13.13.1. shall be in the form set forth in Exhibit 13.13 and shall take effect on the Enforceability Date.

13.13.3 Notwithstanding the waiver and release of claims described in Subparagraph 13.13.1 and Exhibit 13.13, the United States shall retain any right to assert any claim not expressly waived in accordance with that Subparagraph and that Exhibit, in any federal or State court of competent jurisdiction.

**13.14 WAIVER, RELEASE, AND RETENTION OF CLAIMS BY PARTIES OTHER THAN THE SAN JUAN SOUTHERN PAIUTE TRIBE ON BEHALF OF THE SAN JUAN SOUTHERN PAIUTE TRIBE AND THE MEMBERS OF THE SAN JUAN SOUTHERN PAIUTE TRIBE, AND THE UNITED STATES ACTING AS TRUSTEE FOR THE SAN JUAN SOUTHERN PAIUTE TRIBE AND THE MEMBERS OF THE SAN JUAN SOUTHERN PAIUTE TRIBE**

13.14.1 For purposes of this Subparagraph 13.14, the term “Parties” shall mean the Parties, except: (a) the Navajo Nation on behalf of the Navajo Nation and the Members of the Navajo Nation; (b) the United States, acting as trustee for the Navajo Nation, the Members of the Navajo Nation, and the Navajo Allottees; (c) the Hopi Tribe on behalf of the Hopi Tribe and the Members of the Hopi Tribe; (d) the United States acting as trustee for the Hopi Tribe, the Members of the Hopi Tribe, and the Hopi Allottees; (e) the San Juan Southern Paiute Tribe on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe; and (f) the United States acting in its capacity as trustee for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe.

13.14.2 Except as provided in Subparagraph 13.14.4, the Parties shall execute a waiver and release of all claims against the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, and the United States acting as trustee for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe under federal, State, or other law for all:

13.14.2.1 Past and present claims for Injury to Water Rights resulting from the Diversion or Use of Water on San Juan Southern Paiute Land arising from time immemorial through the Enforceability Date;

13.14.2.2 Claims for Injury to Water Rights arising after the Enforceability Date; resulting from the Diversion or Use of Water on or for San Juan Southern Paiute Land in a manner that is not in violation of this Agreement or State law; and

13.14.2.3 Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or the Act.

13.14.3 The waiver and release of claims described in Subparagraph 13.14.2 shall be in the form set forth in Exhibit 13.14 and shall take effect on the Enforceability Date.

13.14.4 Notwithstanding the waiver and release of claims described in Subparagraph 13.14.2 and Exhibit 13.14, the Parties shall retain any right:

13.14.4.1 To assert claims for injuries to, and seek enforcement of, their rights under this Agreement or the Act in any State or federal court of competent jurisdiction;

13.14.4.2 To assert claims for injuries to, and seek enforcement of, their rights under any judgment and decree entered by the court in the LCR Adjudication Proceedings;

13.14.4.3 To assert past, present, and future claims to Water, including Colorado River Water, that are not inconsistent with this Agreement; and

13.14.3.4 To assert any claims arising after the Enforceability Date for Injury to Water Rights not specifically waived herein.

### **13.15 SATISFACTION OF WATER RIGHTS AND OTHER BENEFITS**

13.15.1 The Navajo Nation and the Members of the Navajo Nation.

13.15.1.1 The benefits provided under this Agreement shall be in complete replacement of, complete substitution for, and full satisfaction of any claim of the Navajo Nation and the Members of the Navajo Nation against the Parties, including the United States, that is waived and released by the Navajo Nation acting on behalf of the Navajo Nation and the Members of the Navajo Nation under Subparagraphs 13.1 and 13.3.

13.15.1.2 Any entitlement to Water of the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees) or the United States acting as trustee for the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), for Navajo Land shall be satisfied out of the Water resources and other benefits granted, confirmed, quantified, or recognized by this Agreement and the Act, to or for the Navajo Nation, the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), and the United States, acting as trustee for the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees).

13.15.2 Navajo Allottees and the United States, acting as trustee for the Navajo Allottees.

13.15.2.1 The benefits realized by the Navajo Allottees under this Agreement shall be in complete replacement of, complete substitution for, and full satisfaction of:

(a) all claims waived and released by the United States (acting as trustee for the Navajo Allottees) under Subparagraph 13.2; and

(b) any claims of the Navajo Allottees against the United States similar to the claims described in Subparagraph 13.2 that the Navajo Allottees asserted or could have asserted.

13.15.2.2 Any entitlement to Water of the Navajo Allottees or the United States acting as trustee for the Navajo Allottees, for Navajo Allotments shall be satisfied out of the Water resources and other benefits granted, confirmed, or recognized by this Agreement and the Act, to or for the Navajo Allottees and the United States, acting as trustee for the Navajo Allottees.

13.15.3 Notwithstanding Subparagraphs 13.15.1 and 13.15.2, nothing in this Agreement or the Act recognizes or establishes any right of a Member of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees) to Water on Navajo Land.

13.15.4 The Hopi Tribe and the Members of the Hopi Tribe.

13.15.4.1 The benefits provided under this Agreement shall be in complete replacement of, complete substitution for, and full satisfaction of any claim of the Hopi Tribe and the Members of the Hopi Tribe against the Parties, including the

United States, that is waived and released by the Hopi Tribe acting on behalf of the Hopi Tribe and the Members of the Hopi Tribe under Subparagraphs 13.6 and 13.8.

13.15.4.2 Any entitlement to Water of the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees) or the United States acting as trustee for the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), for Hopi Land shall be satisfied out of the water resources and other benefits granted, confirmed, quantified, or recognized by this Agreement and the Act, to or for the Hopi Tribe, the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), and the United States, acting as trustee for the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees).

13.15.5 Hopi Allottees and the United States, acting as trustee for the Hopi Allottees.

13.15.5.1 The benefits realized by the Hopi Allottees under this Agreement shall be in complete replacement of, complete substitution for, and full satisfaction of:

(a) all claims waived and released by the United States (acting as trustee for the Hopi Allottees) under Subparagraph 13.7; and

(b) any claims of the Hopi Allottees against the United States similar to the claims described in Subparagraph 13.7 that the Hopi Allottees asserted or could have asserted.

13.15.5.2 Any entitlement to Water of the Hopi Allottees or the United States acting as trustee for the Hopi Allottees, for Hopi Allotments shall be satisfied out of the Water resources and other benefits granted, confirmed, or recognized by this Agreement and the Act, to or for the Hopi Allottees and the United States, acting as trustee for the Hopi Allottees.

13.15.6 Notwithstanding Subparagraphs 13.15.4 and 13.15.5, nothing in this Agreement or the Act recognizes or establishes any right of a Member of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees) to Water on Hopi Land.

13.15.7 San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe

13.15.7.1 The benefits provided under this Agreement shall be in complete replacement of, complete substitution for, and full satisfaction of any claim of the San Juan Southern Paiute Tribe and the Member of the San Juan Southern Paiute Tribe against the Parties, including the United States, that is waived and released by the San Juan Southern Paiute Tribe acting on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe under Subparagraphs 13.11 and 13.12.

13.15.7.2 Any entitlement to Water of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe or the United States, acting as trustee for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, for San Juan Southern Paiute Land shall be satisfied out of

the water resources and other benefits granted, confirmed, quantified, or recognized by this Agreement and the Act, to or for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe and the United States, acting as trustee for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe.

13.15.8 Notwithstanding Subparagraphs 13.15.7, nothing in this Agreement or the Act recognizes or establishes any right of a Member of the San Juan Southern Paiute Tribe to Water on San Juan Southern Paiute Land.

#### **13.16 NO EFFECT ON ENFORCEMENT OF ENVIRONMENTAL LAWS**

Nothing in this Agreement precludes the United States, acting as sovereign, the Navajo Nation, the Hopi Tribe, or the San Juan Southern Paiute Tribe from enforcing the requirements of federal environmental law and the regulations implementing such law. Nothing in this Agreement precludes the United States, acting as sovereign, the Navajo Nation, the Hopi Tribe, or the San Juan Southern Paiute Tribe from enforcing the requirements of the environmental laws of the Tribes, and the regulations implementing such laws, on the Navajo Reservation, the Hopi Reservation, the San Juan Southern Paiute Reservation, Navajo Allotments, Hopi Allotments, and lands held in trust by the United States for the benefit of the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe.

#### **14.0 ENFORCEABILITY DATE**

##### **14.1 CONDITIONS TO THE ENFORCEABILITY DATE**

This Agreement, including the waivers and releases of claims described in Paragraph 13.0 of this Agreement and in the Act, shall take effect and be fully enforceable on the date on which the Secretary publishes in the Federal Register a statement of findings that:

14.1.1 This Agreement has been revised, through an amendment and restatement, to:

14.1.1.1 eliminate any conflict between this Agreement and the Act; and

14.1.1.2 include as Exhibits to this Agreement the executed Navajo Nation Water Delivery Contracts required by Subparagraphs 10.1.1, 10.1.2, and 10.1.3, and the executed Hopi Tribe Water Delivery Contracts as required by 11.1.1 and 11.1.2 ;

14.1.2 The Agreement as revised through an amendment and restatement has been signed by all Parties and any exhibit requiring execution by any Party has been executed by the required Party;

14.1.3 The waivers and releases of claims described in Paragraph 13.0 of the Agreement and section 14 of the Act have been executed by the United States, Navajo Nation, Hopi Tribe, San Juan Southern Paiute Tribe, the State, and the Parties;

14.1.4 Five billion dollars (\$5.0 billion) has been appropriated and deposited in the designated accounts;

14.1.5 The LCR Decree has been approved by the LCR Adjudication Court substantially in the form of the judgment and decree attached to this Agreement as Exhibit 3.1.82, as amended to ensure consistency with the Act;

14.1.6 The Gila River Adjudication Decree has been approved by the Gila River Adjudication Court substantially in the form of the judgment and decree attached to this Agreement as Exhibit 3.1.47, as amended to ensure consistency with the Act; and

14.1.7 The San Juan Southern Paiute Tribe and the NTUA have executed the water service agreement referred to in Subparagraph 6.3.1.

14.1.8 The Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe each have executed the tribal resolution referenced in subsection 18(a)(2), 18(b)(2), and 18(c)(2) of the Act consenting to the limited waiver of sovereign immunity from suit in the circumstances described in section 18 of the Act.

## **14.2 FAILURE TO SATISFY CONDITIONS**

Pursuant to section 16 of the Act, if the Secretary fails to publish in the Federal Register a statement of findings under Subparagraph 14.1 of this Agreement by June 30, 2035, or such alternative later date as may be agreed to by the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, the Secretary, and the State, the Act will be repealed and this Agreement shall be void.

## **14.3 CONTINUED EXISTENCE OF THE SAN JUAN SOUTHERN PAIUTE RESERVATION**

Notwithstanding Subparagraph 14.2, if the Secretary fails to publish in the Federal Register a statement of findings under Subparagraph 14.1 of this Agreement by June 30, 2035, or such alternative later date as may be agreed upon by the Navajo Nation, the Hopi

Tribe, the San Juan Southern Paiute Tribe, the Secretary and the State, section 19 of the Act shall remain in full force and effect.

## **15.0 OTHER PROVISIONS**

### **15.1 NO IMPAIRMENT OF EXISTING RIGHTS**

Nothing in this Agreement or any contract entered into pursuant to this Agreement or the Act shall impair any right to the delivery or beneficial consumptive use of Colorado River water under the 1944 Treaty with Mexico or any compact, law, decree, or contract in effect on the Enforceability Date.

### **15.2 RELATION TO PUBLIC DOMAIN ALLOTMENTS**

15.2.1 Nothing in this Agreement:

15.2.1.1 Quantifies or adjudicates any Water Right or any claim or entitlement to Water of a Public Domain Allottee; or

15.2.1.2 Precludes the United States, acting as trustee for Public Domain Allottees, from making claims for Water Rights in Arizona that are consistent with the Abstracts attached as Exhibit 3.1.132B. To the extent authorized by applicable law, Public Domain Allottees, or the United States, acting as trustee for Public Domain Allottees, may make claims to, and may be adjudicated, individual Water Rights in Arizona.

15.2.2 Water rights for Public Domain Allotments shall be separately adjudicated outside of this Agreement. None of the conditions of Use of the Navajo Nation's Water

Rights as set forth in this Agreement shall apply, by virtue of this Agreement, to Water Rights later decreed for Public Domain Allotments.

15.2.3 Water Uses for Public Domain Allotments Outside the Navajo Reservation:

15.2.3.1 Exhibit 3.1.132B describes Water Uses for Public Domain Allotments outside the Navajo Reservation.

15.2.3.2 Except as provided in Subparagraph 15.2.3.3 and Subparagraph 15.2.3.4, the Parties shall not object to, dispute, or challenge, on any basis, in the LCR Adjudication or in any other judicial or administrative proceeding, claims to Water Rights with the attributes described in the Abstracts for the 51 Public Domain Allotments outside the Navajo Reservation attached hereto as Exhibit 3.1.132B; and

15.2.3.3 The Parties retain the right to object to the “Basis of Right” attribute described in the Abstracts for the 51 Public Domain Allotments outside the Navajo Reservation attached hereto as Exhibit 3.1.132B.

15.2.3.4 The United States, acting as trustee for Public Domain Allottees, shall not assert claims to Water Rights that are inconsistent with the Abstracts attached hereto as Exhibit 3.1.132B. The Parties retain the right to object to, dispute, or challenge claims asserted on behalf of Public Domain Allottees that are inconsistent with Abstracts attached hereto as Exhibit 3.1.132B.

**15.3 ENTIRE UNDERSTANDING**

This Agreement constitutes the entire understanding among the Parties. Evidence of conduct or statements made in the course of negotiating this Agreement, including, but not limited to previous drafts of this Agreement, is inadmissible in any legal proceedings.

#### **15.4 MODIFICATIONS TO AGREEMENT AND AMENDMENTS TO EXHIBITS**

15.4.1 Amendments to the Agreement. No modification of this Agreement after the Enforceability Date shall be effective unless it is in writing, signed by all Parties, and is approved by the LCR Adjudication Court. Notice of such amendments shall be made to all of the Parties in accordance with Subparagraph 15.18.

15.4.2 Amendments to Exhibits. Notwithstanding the provisions of Subparagraph 15.4.1, Exhibits to this Agreement may be amended by the Parties to such Exhibits in accordance with their terms, without LCR Adjudication Court approval, unless such approval is required in the Exhibit or by law; provided, however, that no amendment of any Exhibit may violate any provisions of the Act, or this Agreement, or adversely affect the rights under this Agreement of any Party who is not a signatory of such an amendment. Notice of such amendments shall be made to all of the Parties in accordance with Subparagraph 15.18. Failure to provide such notice in accordance with the terms of Subparagraph 15.18 shall not affect the validity of an amendment to an Exhibit made hereunder.

#### **15.5 STATE CAPACITY**

15.5.1 Execution by the Governor. Execution of this Agreement by the Governor of the State constitutes the commitment of the State to assist in carrying out the provisions of this Agreement to the extent it may do so in accordance with its responsibility and authority under the law. Execution of this Agreement by the Governor of the State also constitutes

the commitment of the State to carry out the terms and conditions of Subparagraphs 9.4.1, 9.4.1.1, 9.4.1.2, 9.9, 13.5, 13.10 and 13.14.

15.5.2 Execution by State Agencies. Execution of this Agreement by the Arizona State Land Department, the Arizona Game and Fish Commission and the Arizona Department of Transportation signifies that provisions of this Agreement affecting the State as a Claimant have been approved by the Arizona State Land Department, the Arizona Game and Fish Commission, the Arizona Department of Transportation, and these agencies assume the obligations of and are entitled to the benefits of this Agreement.

15.5.3 Exceptions. Except as provided in Subparagraphs 15.5.1 and 15.5.2, it is not intended that this Agreement shall be determinative of any decision or recommendation to be made by any State agency in any administrative, adjudicatory, rule making, or other proceeding or matter.

## **15.6 PARTIES BOUND ON EFFECTIVE DATE; OBLIGATION TO WORK IN GOOD FAITH**

With the exception of the United States, all of the Parties shall be bound by the terms of this Agreement as of the Effective Date, regardless of the date on which the Party executes the Agreement. Each Party shall have the obligation to work in good faith to satisfy the conditions in this Agreement.

## **15.7 STAY OF LITIGATION AND WITHDRAWAL OF OBJECTIONS**

15.7.1 Not later than 30 days following the Effective Date, the Parties who are parties to the LCR Adjudication shall file a motion in the form attached hereto as Exhibit

15.7.1 in the LCR Adjudication Court to stay all litigation relating to the claims of the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and the United States on their behalf.

15.7.2 Not later than 30 days following the Effective Date, the Parties who are parties to the LCR Adjudication shall file and seek approval by the LCR Adjudication Court of stipulations in substantially the same form as the form of stipulations attached hereto as Exhibit 15.7.2.

## **15.8 AUTHORITY TO EXECUTE**

By signing this Agreement each signatory represents that he or she has the authority to execute it.

## **15.9 RIGHT TO PETITION ANY COURT OF COMPETENT JURISDICTION**

Any Party shall have the right to petition any State or federal court of competent jurisdiction, without any requirement to exhaust tribal administrative or judicial remedies, for such declaratory and injunctive relief as may be necessary to enforce the terms, conditions, and limitations of this Agreement. Nothing contained herein waives the right of the United States, the Navajo Nation, the Hopi Tribe, or the San Juan Southern Paiute Tribe to object to the jurisdiction of the courts of the State to adjudicate any dispute arising under this Agreement or the Act. Furthermore, nothing herein waives the right of any Party to object to the jurisdiction of any federal Court to adjudicate a dispute arising under this Agreement or the Act.

**15.10 GOVERNING LAW**

This Agreement shall be construed in accordance with applicable law.

**15.11 SUCCESSORS AND ASSIGNS**

This Agreement shall inure to the benefit of and be binding upon the successors and assigns of the Parties, including successor State agencies.

**15.12 STATE CONFLICT OF INTEREST**

The provisions of A.R.S. § 38-511 are incorporated by reference herein.

**15.13 ANTI-DEFICIENCY**

15.13.1 United States. The expenditure or advance of any money or the performance of any obligation by the United States, in any of its capacities, under this Agreement shall be contingent upon appropriation of funds. The United States shall not be liable for the failure to carry out any obligation or activity authorized under this Agreement and the Act (including any such obligation or activity under this Agreement and the Act) if adequate appropriations are not provided by Congress expressly to carry out the purposes of this Agreement and the Act.

15.13.2 State. The expenditure or advance of any money or the performance of any obligation by the State, in any of its capacities, under this Agreement shall be contingent upon appropriation of funds. No liability shall accrue to the State, in any of its capacities, in the event funds are not appropriated.

**15.14 NO BENEFIT TO MEMBERS OF CONGRESS OR RESIDENT COMMISSIONERS**

No member of or delegate to Congress or Resident Commissioner shall be admitted to any share of this Agreement or to any benefit that may arise herefrom. This restriction shall not be construed to extend to this Agreement if made with a corporation or company for its general benefit.

#### **15.15 DUPLICATE ORIGINALS AND COUNTERPARTS**

This Agreement may be executed in one or more counterparts, each of which shall constitute an original, and all of which, when taken together, shall constitute one and the same instrument. This Agreement also may be executed in duplicate originals, each of which shall constitute an original Agreement.

#### **15.16 NO QUANTIFICATION OR EFFECT ON RIGHTS OF OTHER TRIBES OR THE UNITED STATES ON THEIR BEHALF**

Except as provided in Subparagraph 8.3:

15.16.1 Nothing in this Agreement shall be construed to quantify or otherwise affect the Water Rights, claims or entitlements to Water of any Indian tribe, nation, band or community, other than the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe.

15.16.2 Nothing in this Agreement shall affect the ability of the United States to take action on behalf of any Indian tribe, nation, band, community, other than the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and their Members, Navajo Allottees, Hopi Allottees, and Public Domain Allottees.

#### **15.17 CONSTRUCTION AND EFFECT**

The Paragraph and Subparagraph titles used in this Agreement are for convenience only and shall not be considered in the construction of this Agreement. As used in this Agreement, a capitalized term shall have the meaning set forth in Subparagraph 3.1. All other words shall have their ordinary meaning.

#### **15.18 NOTICES**

All notices required to be given hereunder shall be in writing and may be given in person or by United States mail postage prepaid, and shall become effective at the earliest of actual receipt by the Party to whom notice is given, when delivered to the designated address of the Party, or if mailed, forty-eight hours after deposit in the United States mail addressed as shown on Exhibit 15.18 or to such other address as such Party may from time to time designate in writing. Any communication by facsimile transmission or electronic mail by one Party to another shall not constitute effective notice as is required by this Subparagraph, but shall be deemed to be given as a courtesy only.

#### **15.19 INTENDED THIRD-PARTY BENEFICIARIES**

Any Person who is not a Party to this Agreement but whose Water Rights are protected by this Agreement is a third-party beneficiary and is entitled to enforce the provisions of this Agreement against the Parties.

#### **15.20 NO STATE LEGISLATION PERMITTING GROUNDWATER TRANSPORTATION OUT OF LITTLE COLORADO RIVER BASIN**

After the Enforceability Date, the Parties, other than the State, the Arizona State Land Department, the Arizona Game and Fish Commission, the Arizona Department of

Transportation, and the United States, shall not seek legislation, and shall oppose any bill introduced in the state legislature, that would allow groundwater to be transported away from the Little Colorado River Plateau Groundwater Basin, except as allowed under A.R.S. § 45-544 in effect on the Effective Date.

#### **15.21 ATKINSON TRADING COMPANY, INC., PROPERTY**

The terms of this Agreement and the laws of the State shall apply to the withdrawal or Use of Water from the two Existing Wells owned by the Atkinson Trading Company, Inc. and any replacement Well(s). This Agreement does not address: (a) jurisdiction over land that Atkinson Trading Company, Inc. owns or claims to own, or other facilities owned by Atkinson Trading Company, Inc. for any other purpose; or (b) ownership of land between the west bank of the Little Colorado River and the centerline of the Little Colorado River located in Section 22, T29N, R9E, which is part of the land depicted in the map attached as Exhibit 8.5.2. The Navajo Nation, the United States acting as trustee for the Navajo Nation, and the Atkinson Trading Company, Inc. retain their rights or claims concerning the described land. The assertion of such rights or claims relating to said land, if any, or the resolution of such claims in any forum or tribunal, shall not modify or affect in any way the provisions of this Agreement regarding Atkinson Trading Company, Inc.'s withdrawal and Use of Water including the jurisdiction over such withdrawal and Use of Water.

#### **15.22 PARAGRAPH AND SUBPARAGRAPH REFERENCES**

A reference to a Paragraph of this Agreement shall mean a reference to the Paragraph in its entirety, including all Subparagraphs of that Paragraph. A reference to a

*Agreement Dated as of May 9, 2024*

Subparagraph of this Agreement shall mean a reference to the Subparagraph in its entirety, including all subparagraphs of that Subparagraph.

**16.0 EXECUTION BLOCKS**

**IN WITNESS HEREOF**, the Parties have executed this Agreement dated as of the day and year first above written.

*Agreement Dated as of May 9, 2024*

**THE UNITED STATES OF AMERICA**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Secretary of the Interior

*Agreement Dated as of May 9, 2024*

**THE STATE OF ARIZONA**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Governor

Attest: \_\_\_\_\_

Secretary of State

**SIGNATURE AUTHORITY**

The undersigned representatives of the Navajo Nation to this Agreement certify that he and she are fully authorized to enter into the terms and conditions of this Agreement, to execute it, and to bind the Navajo Nation to this Agreement.

**Navajo Nation**

This Agreement is executed by the Navajo Nation, acting through its President and its Attorney General.

IN WITNESS WHEREOF, the Navajo Nation has executed this Agreement on the dates provided below.

**THE NAVAJO NATION**

By: \_\_\_\_\_  
Buu Nygren, President

Date: \_\_\_\_\_

By: \_\_\_\_\_  
Ethel Branch, Attorney General

Date: \_\_\_\_\_

*Agreement Dated as of May 9, 2024*

**HOPI TRIBE**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Chairman

Attest: \_\_\_\_\_

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**SAN JUAN SOUTHERN PAIUTE TRIBE**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

President

Attest: \_\_\_\_\_

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**SALT RIVER PROJECT AGRICULTURAL  
IMPROVEMENT AND POWER DISTRICT**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

President

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**SALT RIVER VALLEY WATER USERS' ASSOCIATION**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

President

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**CENTRAL ARIZONA WATER CONSERVATION DISTRICT**

By: \_\_\_\_\_

President

Attest: \_\_\_\_\_

Secretary

*Agreement Dated as of May 9, 2024*

**ARIZONA PUBLIC SERVICE CO.**

By: \_\_\_\_\_  
Title: \_\_\_\_\_  
Dated: \_\_\_\_\_

Attest: \_\_\_\_\_  
Secretary

Approved as to form:

\_\_\_\_\_  
Attorney

THE CITY OF FLAGSTAFF, an Arizona municipal corporation
Mayor
APPROVED AS TO FORM:
City Attorney
ATTEST:
City Clerk

*Agreement Dated as of May 9, 2024*

**CITY OF WINSLOW**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Mayor

Attest: \_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney

**CITY OF HOLBROOK**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Mayor

Attest: \_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney

*Agreement Dated as of May 9, 2024*

**CITY OF SHOW LOW**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Mayor

Attest: \_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney

*Agreement Dated as of May 9, 2024*

**CITY OF ST. JOHNS**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Mayor

Attest: \_\_\_\_\_

City Clerk

Approved as to form:

\_\_\_\_\_

City Attorney

**TOWN OF EAGAR**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Mayor

Attest: \_\_\_\_\_

Town Clerk

Approved as to form:

\_\_\_\_\_

Town Attorney

**TOWN OF SNOWFLAKE**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Mayor

Attest: \_\_\_\_\_

Town Clerk

Approved as to form:

\_\_\_\_\_

Town Attorney

**TOWN OF SPRINGVILLE**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Mayor

Attest: \_\_\_\_\_

Town Clerk

Approved as to form:

\_\_\_\_\_

Town Attorney

**TOWN OF TAYLOR**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Mayor

Attest: \_\_\_\_\_

Town Clerk

Approved as to form:

\_\_\_\_\_

Town Attorney

*Agreement Dated as of May 9, 2024*

**BART BAR RANCH, INC.**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

President

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**BART BAR RANCH COMPANY, LLP, INC.**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

President

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**METEOR CRATER ENTERPRISES, INC.**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

President

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**CRATER RANCH, LLC**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

President

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**FLYING M RANCH, INC.**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

President

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**AZTEC LAND AND CATTLE COMPANY, LIMITED**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

President

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**AZTEC LAND COMPANY, LLC**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

President

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**ARIZONA STATE LAND DEPARTMENT**

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

*Agreement Dated as of May 9, 2024*

**ARIZONA GAME AND FISH COMMISSION**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**ARIZONA DEPARTMENT OF TRANSPORTATION**

By: \_\_\_\_\_

Title: \_\_\_\_\_

Dated: \_\_\_\_\_

*Agreement Dated as of May 9, 2024*

**GROVER'S HILL IRRIGATION DISTRICT**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**J. ALBERT BROWN RANCHES, INC.**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**PIONEER IRRIGATION COMPANY**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**SHOW LOW/PINETOP-WOODLAND IRRIGATION COMPANY**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**SILVER CREEK IRRIGATION DISTRICT**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**LAKESIDE IRRIGATION COMPANY**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**LITTLE COLORADO WATER CONSERVATION DISTRICT**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**FOREST LAKES DOMESTIC WATER IMPROVEMENT DISTRICT**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**PINETOP-LAKESIDE SANITARY DISTRICT**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**PORTER SPRINGS, LLC**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

*Agreement Dated as of May 9, 2024*

**ATKINSON TRADING COMPANY, INC.**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

Attest and Countersigned: \_\_\_\_\_

Secretary

Approved as to form:

\_\_\_\_\_

Attorney

**EXHIBIT 3.1.4**

**ATTACHED**

May 9, 2024

\_\_\_\_\_ CONGRESS

\_\_\_\_\_ SESSION

S. \_\_\_\_\_

\_\_\_\_\_  
IN THE SENATE OF THE UNITED STATES

\_\_\_\_\_ **A BILL**

To provide for the settlement of the water rights claims of the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

## TABLE OF CONTENTS

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- SEC. 2. Purposes.
- SEC. 3. Definitions.
- SEC. 4. Ratification and Execution of The Northeastern Arizona Indian Water Rights Settlement Agreement.
- SEC. 5. Water Rights.
- SEC. 6. Allocation and Assignment of Colorado River Water to the Tribes; Water Delivery Contracts.
- SEC. 7. Colorado River Water Leases and Exchanges; Uses.
- SEC. 8. The iina' ba' - paa tuwaqat'si pipeline; Construction; Ownership.
- SEC. 9. The iina' ba' - paa tuwaqat'si pipeline Implementation Fund.
- SEC. 10. The Navajo Nation Water Settlement Trust Fund.
- SEC. 11. The Hopi Tribe Settlement Trust Fund.
- SEC. 12. The San Juan Southern Paiute Tribe Water Settlement Trust Fund.
- SEC. 13. Funding.
- SEC. 14. Waivers, Releases, and Retention of Claims.
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- SEC. 16. Enforceability Date.
- SEC. 17. Colorado River Accounting.
- SEC. 18. Limited Waiver of Sovereign Immunity.
- SEC. 19. Ratification of the Treaty; Proclamation of San Juan Southern Paiute Reservation.
- SEC. 20. In general.

**SEC. 1. SHORT TITLE.**

This Act may be cited as the “Northeastern Arizona Indian Water Rights Settlement Act of 2024.”

**SEC. 2. PURPOSES.**

The purposes of this Act are—

(1) to achieve a fair, equitable and final settlement of all claims to rights to Water in the State of Arizona for—

(A) the Navajo Nation and Navajo Allottees;

(B) the Hopi Tribe and Hopi Allottees;

(C) the San Juan Southern Paiute Tribe; and

(D) the United States, acting as trustee for the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, Navajo Allottees, and Hopi Allottees;

(2) to authorize, ratify, and confirm the Northeastern Arizona Indian Water Rights Settlement Agreement entered into by the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe, the State, and other Parties to the extent that the Northeastern Arizona Indian Water Rights settlement agreement is consistent with this Act;

(3) to authorize and direct the Secretary to execute and perform the duties and obligations of the Secretary under the settlement agreement and this Act; and

(4) to authorize funds necessary for the implementation of the settlement agreement and this Act.

### SEC. 3. DEFINITIONS.

In this title:

(1) 1882 RESERVATION. The term “1882 Reservation” means those lands within the exterior boundaries of the “Hopi Indian Reservation” defined as District 6, and all lands withdrawn by the Executive Order of Dec. 16, 1882 and partitioned to the Hopi Tribe in accordance with the Act of Dec. 22, 1974, Pub. L. 93-531, § 4, 88 Stat. 1713 (formerly codified as amended at 25 U.S.C. § 640d-3), by Judgment of Partition, Feb. 10, 1977, *Sekaquaptewa v. MacDonald*, Case No. CIV-579-PCT-JAW (D. Ariz.), *aff’d*, 626 F.2d 113 (9th Cir. 1980).

(2) 1934 ACT CASE. The term “1934 Act Case” means *Honyoama v. Shirley, Jr.*, Case No. CIV 74-842-PHX-EHC (D. Ariz. 2006).

(3) AFY. The term “afy” means acre-feet per Year.

(4) ARIZONA DEPARTMENT OF WATER RESOURCES OR ADWR. The terms “Arizona Department of Water Resources” or “ADWR” mean the agency of the State established pursuant to Arizona Revised Statutes § 45-102, *et seq.*, or its successor agency or entity.

(5) CENTRAL ARIZONA PROJECT OR CAP. The terms “Central Arizona Project” or “CAP” mean the federal reclamation project authorized and constructed by the United States in accordance with Title III of the Colorado River Basin Project Act (43 U.S.C. § 1521, *et seq.*).

(6) CENTRAL ARIZONA WATER CONSERVATION DISTRICT OR CAWCD. The terms “Central Arizona Water Conservation District” or “CAWCD” mean the political subdivision of the State that is the contractor under the CAP Repayment Contract.

(7) CAP REPAYMENT CONTRACT. The term CAP Repayment Contract” means:

- (A) the contract dated December 1, 1988 (Contract No. 14-06-W-245, Amendment No. 1), between the United States and the Central Arizona Water Conservation District for the delivery of Water and the repayment of costs of the Central Arizona Project; and
- (B) any amendment to, or revision of, that contract.

(8) CIBOLA WATER. The term “Cibola Water” means the Hopi Tribe’s entitlement to the Diversion of up to 4,278 afy of the Fourth Priority Water described in the Hopi Tribe Existing Cibola Contract.

(9) COLORADO RIVER COMPACT. The term “Colorado River Compact” means the Colorado River Compact of 1922, as ratified and reprinted in article 2 of chapter 7 of title 45, Arizona Revised Statutes.

(10) COLORADO RIVER WATER.

- (A) The term “Colorado River Water” means the waters of the Colorado River apportioned for use within the State by the Boulder Canyon Project Act of 1928, 43 U.S.C. §§ 617c and 617d, as amended; the Upper Colorado River Basin Compact of 1948, as ratified and reprinted, article 3 of chapter 7 of title 45, Arizona Revised Statutes; the Colorado River Basin Project Act of 1968, 43 U.S.C. § 1501, *et seq.*, as amended; the Contract for Delivery of Water Between the United States and the State of Arizona dated February 9, 1944; and the Decree.

- (B) The definition of Colorado River Water in this Agreement and this Act shall be used only for purposes of interpreting the settlement agreement and this Act, and shall not be used for any interpretation of existing law or contract, including:
- (i) The Boulder Canyon Project Act of 1928, 43 U.S.C. §§ 617c and 617d, as amended;
  - (ii) the Upper Colorado River Basin Compact of 1948, as ratified and reprinted in article 3 of chapter 7 of title 45, Arizona Revised Statutes;
  - (iii) the Colorado River Basin Project Act of 1968, 43 U.S.C. § 1501, *et seq.*, as amended;
  - (iv) the Contract for Delivery of Water Between the United States and the State of Arizona dated February 9, 1944; and
  - (v) the Decree.

(11) DECREE. The term “Decree” means, when used without a modifying adjective, collectively the decree of the Supreme Court of the United States in *Arizona v. California*, 376 U.S. 340 (1964), the Consolidated Decree entered on March 27, 2006, in that case, 547 U.S. 150, and any modifications thereof.

(12) DIVERSION. The term “Diversion” means an act to Divert.

(13) DIVERT, DIVERTING, AND DIVERTED. The terms “Divert,” “Diverting,” and “Diverted” mean to receive, withdraw, develop, produce, or capture Water using:

- (A) a ditch, canal, flume, bypass, pipeline, pit, collection or infiltration gallery, conduit, Well, pump, turnout, dam, or any other mechanical device; or
- (B) any other human act.

(14) **EFFECTIVE DATE.** The term “Effective Date” means the date as of which the settlement agreement has been executed by no less than 30 of the Parties including all of the following: the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, the State of Arizona, the Arizona State Land Department, the Central Arizona Water Conservation District, the Salt River Project Agricultural Improvement and Power District, and the Salt River Valley Water Users’ Association.

(15) **EFFLUENT.** The term “Effluent” means water that: (a) has been used in the State for domestic, municipal, or industrial purposes, other than solely for hydropower generation; and (b) is available fore re-use for any purpose, regardless of whether the water has been treated to improve the quality of the water.

(16) **ENACTMENT DATE.** The term “Enactment Date” means the date of enactment of this Act.

(17) **ENFORCEABILITY DATE.** The term “Enforceability Date” means the date described in section 16 of this Act.

(18) **FIFTH PRIORITY WATER.** The term “Fifth Priority Water” means Fifth Priority Water as that term is defined in the Hopi Tribe Existing Cibola Contract.

(19) **FOURTH PRIORITY WATER.** The term “Fourth Priority Water” means Colorado River Water available for delivery within the State for satisfaction of entitlements:

- (A) in accordance with contracts, Secretarial reservations, perfected rights, and other arrangements between the United

States and Water users in the State entered into or established subsequent to September 30, 1968, for use on Federal, State, or privately owned lands in the State, in a total quantity not greater than 164,652 afy of Diversions; and

- (B) after first providing for the delivery of Colorado River Water for the CAP System, including for use on Indian land, under Section 304(e) of the Colorado River Basin Project Act (43 U.S.C. § 1524(e)), in accordance with the CAP Repayment Contract.

(20) GILA RIVER ADJUDICATION. The term “Gila River Adjudication” means that action pending in the Superior Court of the State, in and for the County of Maricopa, *In re the General Adjudication of All Rights To Use Water in The Gila River System and Source*, W-1 (Salt), W-2 (Verde), W-3 (Upper Gila), W-4 (San Pedro) (Consolidated).

(21) GILA RIVER ADJUDICATION COURT. The term “Gila River Adjudication Court” means the Superior Court of the State, in and for the County of Maricopa, exercising jurisdiction over the Gila River Adjudication.

(22) GILA RIVER ADJUDICATION DECREE. The term “Gila River Adjudication Decree” means the judgment or decree entered by the Gila River Adjudication Court in substantially the same form as the form of judgment attached to the settlement agreement as Exhibit 3.1.48.

(23) GROUNDWATER. The term “Groundwater” means all Water beneath the surface of the earth within the State that is not:

- (A) Surface Water;
- (B) Colorado River Water; or
- (C) Effluent.

(24) HOPI ALLOTMENT. The term “Hopi Allotment” means any of the eleven (11) parcels allotted pursuant to Section 4 of the General Allotment Act of 1887, 24 Stat. 389, ch. 119 (formerly codified at 25 U.S.C. § 334) that are:

- (A) located within the exterior boundaries of the Hopi Reservation; and
- (B) held in trust by the United States for the benefit of one or more individual Indians under allotment record numbers AR-39, -40, -41, -42, -43, -44, -45, -46, -47, -48, and -49.

(25) HOPI ALLOTTEE. The term “Hopi Allottee” means an individual Indian holding a beneficial interest in a Hopi Allotment, or an Indian Tribe holding an undivided fractional beneficial interest in a Hopi Allotment.

(26) HOPI FEE LAND. The term “Hopi Fee Land” means land, other than Hopi Trust Land, that:

- (A) is located in the State;
- (B) is located outside the exterior boundaries of the Hopi Reservation; and
- (C) as of the Enforceability Date, is owned by the Hopi Tribe; whether in its own name or through an entity wholly owned or controlled by the Hopi Tribe.

(27) HOPI LAND. The term “Hopi Land” means, collectively, the Hopi Reservation, Hopi Trust Land, and Hopi Fee Land.

(28) HOPI RESERVATION. The term “Hopi Reservation” means those lands within the exterior boundaries of the “Hopi Indian Reservation” defined as District 6, and all lands withdrawn by the Executive Order of Dec. 16, 1882 and partitioned to the Hopi Tribe in accordance with the Act of Dec. 22, 1974, Pub. L. 93-531, § 4, 88 Stat. 1713 (formerly codified as amended at 25 U.S.C. § 640d-3), by Judgment of Partition, Feb. 10, 1977, *Sekaquaptewa v. MacDonald*, Case No. CIV-579-PCT-JAW (D. Ariz.), aff’d, 626 F.2d 113 (9th Cir. 1980), and all lands recognized as part of the Hopi Reservation in the 1934 Act Case. The foregoing description of the Hopi Reservation is more particularly set forth on the map attached to the settlement agreement as Exhibit 3.1.57. In case of a conflict between this definition and Exhibit 3.1.57 of the settlement agreement, Exhibit 3.1.57 shall be demonstrative only, and this definition shall control.

(29) HOPI TRIBE. The term “Hopi Tribe” means the Hopi Tribe, a tribe of Hopi Indians organized under Section 16 of the Indian Reorganization Act of June 18, 1934, 48 Stat. 987 (25 U.S.C. § 476), and duly recognized by the Secretary (89 Fed. Reg. 944, 945 (Jan. 8, 2024)).

(30) HOPI TRIBE AGRICULTURAL CONSERVATION TRUST FUND ACCOUNT. The term “Hopi Tribe Agricultural Conservation Trust Fund Account” means the account created pursuant to section 11(b)(3) of this Act and described in subparagraph 12.3.3 of the settlement agreement.

(31) Hopi TRIBE CIBOLA WATER. The term “Hopi Tribe Cibola Water” means the Fourth, Fifth, and Sixth Priority Colorado River Water to which the Hopi Tribe is entitled pursuant to subparagraphs 5.8.2 and 5.8.3 of the settlement agreement.

(32) HOPI TRIBE EXISTING CIBOLA CONTRACT. The term “Hopi Tribe Existing Cibola Contract” means Contract No. 04-XX-30-W0432 between the United States and the Hopi Tribe, as amended and in full force and effect as of the Effective Date.

(33) HOPI TRIBE GROUNDWATER PROJECTS. The term “Hopi Tribe Groundwater Projects” means the projects described in section 11(f)(1) of this Act and in subparagraph 12.3.1 of the settlement agreement.

(34) HOPI TRIBE GROUNDWATER PROJECTS TRUST FUND ACCOUNT. The term “Hopi Tribe Groundwater Projects Trust Fund Account” means the account created pursuant to section 11(b)(1) of this Act and described in subparagraph 12.3.1 of the settlement agreement.

(35) HOPI TRIBE LOWER BASIN COLORADO RIVER WATER ACQUISITION TRUST FUND ACCOUNT. The term “Hopi Tribe Lower Basin Colorado River Water Acquisition Trust Fund Account” means the account created pursuant to section 11(b)(4) of this Act and described in subparagraph 12.3.4 of the settlement agreement.

(36) HOPI TRIBE OM&R TRUST FUND ACCOUNT. The term “Hopi Tribe OM&R Trust Fund Account” means the account created pursuant to section 11(b)(2) of this Act and described in subparagraph 12.3.2 of the settlement agreement.

(37) HOPI TRIBE SETTLEMENT CIBOLA CONTRACT. The term “Hopi Tribe Settlement Cibola Contract” means the contract entered into between the United States and the Hopi Tribe pursuant to section 6 of this Act and the settlement agreement for delivery of Hopi Tribe Cibola Water after the Enforceability Date.

(38) HOPI TRIBE UPPER BASIN COLORADO RIVER WATER. The term “Hopi Tribe Upper Basin Colorado River Water” means the 2,300 afy of Upper Basin

Colorado River Water allocated to the Hopi Tribe pursuant to section 6 of this Act and as provided in subparagraphs 5.7 and 11.1.1 of the settlement agreement.

(39) HOPI TRIBE WATER DELIVERY CONTRACT. The term “Hopi Tribe Water Delivery Contract” means one or more contracts entered into by Secretary and the Hopi Tribe in accordance with section 6 of this Act and paragraph 11 of the settlement agreement for the delivery of Hopi Tribe Upper Basin Colorado River Water or Hopi Tribe Cibola Water.

- (40) HOPI TRUST LAND. The term “Hopi Trust Land” means land that:
- (A) is located in the State;
  - (B) is located outside the exterior boundaries of the Hopi Reservation; and
  - (C) as of the Enforceability Date is held in trust by the United States for the benefit of the Hopi Tribe.

(41) IINÁ BÁ - PAA TUWAQAT’SI PIPELINE. The term “iiná bá - paa tuwaqat’si pipeline” means the water project described in section 8 of this Act and subparagraph 12.1 of the settlement agreement.

(42) IINÁ BÁ – PAA TUWAQAT’SI PIPELINE IMPLEMENTATION FUND ACCOUNT. The term “iiná bá – paa tuwaqat’si pipeline Implementation Fund Account” means the account created in the Treasury of the United States described in section 9 of this Act and subparagraph 12.1.1 of the settlement agreement.

(43) IMPOUNDMENT. The term “Impoundment” means a human-made structure used to store water.

(44) INJURY TO RIGHTS TO SURFACE WATER. The term “Injury to Rights to Surface Water” means a direct Diversion of Surface Water, other than from

a Well, that materially diminishes the flows and flood flows of Surface Water on the Navajo Reservation or on a Navajo Allotment, relating only to paragraph 8.0 of the settlement agreement.

(45) INJURY TO WATER. The term “Injury to Water” means injury to water based on changes in or degradation of the salinity or concentration of naturally occurring chemical constituents contained in Water.

(46) INJURY TO WATER RIGHTS. The term “Injury to Water Rights” means an interference with, diminution of, or deprivation of, Water Rights under Federal, State, or other law. The term “Injury to Water Rights” does not include any injury to water quality.

(47) IRRIGATION. The term “Irrigation” means the use of water on two (2) or more acres of land to produce plants or parts of plants for sale or human consumption, or for use as feed for livestock, range livestock, or poultry.

(48) LCR. The term “LCR” means the Little Colorado River.

(49) LCR ADJUDICATION. The term “LCR Adjudication” means that action pending in the Superior Court of the State, in and for the County of Apache, *In re: the General Adjudication of All Rights to Use Water in the Little Colorado River System and Source*, CIV No. 6417.

(50) LCR ADJUDICATION COURT. The term “LCR Adjudication Court” means the Superior Court of the State, in and for the County of Apache, exercising jurisdiction over the LCR Adjudication.

(51) LCR DECREE. The term “LCR Decree” means the judgment or decree entered by the LCR Adjudication Court in substantially the same form as the form of judgment attached as Exhibit 3.1.82 to the settlement agreement.

(52) LCR WATERSHED. The term “LCR Watershed” means lands located within the Surface Water drainage of the LCR and its tributaries in the State, as shown on the map attached as Exhibit 3.1.83 to the settlement agreement.

(53) Lower Basin. The term “Lower Basin” means the ‘Lower Basin’ as defined in Article II(g) of the Colorado River Compact.

(54) MEMBER OR MEMBERS. The terms “Member” or “Members” means any person or persons duly enrolled as a member or members of the Navajo Nation, the Hopi Tribe, or the San Juan Southern Paiute Tribe.

(55) NAVAJO ALLOTMENT. The term “Navajo Allotment” means a parcel of land patented pursuant to Section 1 of the General Allotment Act of 1887, 24 Stat. 388, ch. 119 (formerly codified at 25 U.S.C. § 331):

- (A) originally allotted to an individual identified in the allotting document as a Navajo Indian;
- (B) located within the exterior boundaries of the Navajo Reservation; and
- (C) held in trust by the United States for the benefit of one or more individual Indians.

(56) NAVAJO ALLOTTEE. The term “Navajo Allottee” means an individual Indian holding a beneficial interest in a Navajo Allotment, or an Indian Tribe holding an undivided fractional beneficial interest in a Navajo Allotment.

(57) NAVAJO FEE LAND. The term “Navajo Fee Land” means land, other than Navajo Trust Land, that:

- (A) is located in the State;
- (B) is located outside the exterior boundaries of the Navajo Reservation; and
- (C) as of the Enforceability Date, is owned by the Navajo Nation, whether in its own name or through an entity wholly owned or controlled by the Navajo Nation.

(58) NAVAJO-GALLUP WATER SUPPLY PROJECT. The term “Navajo-Gallup Water Supply Project” means the project authorized, constructed, and operated pursuant to the Northwestern New Mexico Rural Water Projects Act.

(59) NAVAJO LAND. The term “Navajo Land” means collectively, the Navajo Reservation, Navajo Trust Land, and Navajo Fee Land.

(60) NAVAJO NATION. The term “Navajo Nation” means the Navajo Nation, a body politic and federally recognized Indian nation, 89 Fed. Reg.944, 945 (Jan. 8, 2024), also known variously as the ‘Navajo Tribe’, the ‘Navajo Tribe of Arizona, New Mexico & Utah’, the ‘Navajo Tribe of Indians’, and other similar names, and includes all bands of Navajo Indians and chapters of the Navajo Nation.

(61) NAVAJO NATION AGRICULTURAL CONSERVATION TRUST FUND ACCOUNT. The term “Navajo Nation Agricultural Conservation Trust Fund Account” means the account created in the Treasury of the United States pursuant to subsection 10(b) of this Act and described in subparagraph 12.2.4 of the settlement agreement.

(62) NAVAJO NATION CIBOLA WATER. The term “Navajo Nation Cibola Water” means the Navajo Nation’s entitlement to the diversion of up to 100 afy of Fourth Priority Water at the same location and for the same Uses described in the Hopi Tribe Existing Cibola Contract or the delivery and consumptive use of up to

71.5 afy at locations and for Uses within the State other than as described in the Hopi Tribe Existing Cibola Contract, which shall have been assigned and transferred by the Hopi Tribe from its Cibola Water under the Hopi Tribe Existing Cibola Contract to the Navajo Nation.

(63) NAVAJO NATION FOURTH PRIORITY WATER. The term “Navajo Nation Fourth Priority Water” means the Diversion right to 3,500 afy of Fourth Priority Water reserved for use in a Navajo-Hopi Indian water rights settlement under paragraph 11.3 of the Arizona Water Settlement Agreement among the United States, the State of Arizona, and the Central Arizona Water Conservation District, as authorized by Section 106(a)(1) and (2) of Public Law 108-451, and allocated to the Navajo Nation pursuant to section 6 of this Act and as described in subparagraphs 4.9 and 10.1 of the settlement agreement.

(64) NAVAJO NATION LOWER BASIN COLORADO RIVER WATER ACQUISITION TRUST FUND ACCOUNT. The term “Navajo Nation Lower Basin Colorado River Water Acquisition Trust Fund Account” means the account created pursuant to subsection 10(b) of this Act and described in subparagraph 12.2.5 of the settlement agreement.

(65) NAVAJO NATION OM&R TRUST FUND ACCOUNT. The term “Navajo Nation OM&R Trust Fund Account” means the account created pursuant to subsection 10(b) of this Act and described in subparagraph 12.2.2 of the settlement agreement .

(66) NAVAJO NATION RENEWABLE ENERGY TRUST FUND ACCOUNT. The term “Navajo Nation Renewable Energy Trust Fund Account” means the account created pursuant to subsection 10(b) of this Act and described in subparagraph 12.2.3 of the settlement agreement.

(67) NAVAJO NATION UPPER BASIN COLORADO RIVER WATER. The term “Navajo Nation Upper Basin Colorado River Water” means the 44,700 afy of Upper Basin Colorado River Water allocated to the Navajo Nation pursuant to section 6 of this Act and as described in subparagraphs 4.7 and 10.1 of the settlement agreement.

(68) NAVAJO NATION WATER DELIVERY CONTRACT. The term “Navajo Nation Water Delivery Contract” means one or more contracts entered into by Secretary and the Navajo Nation in accordance with section 6 of this Act and pursuant to paragraph 10 of the settlement agreement for the delivery of Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, or Navajo Nation Fourth Priority Water.

(69) NAVAJO NATION WATER PROJECTS. The term “Navajo Nation Water Projects” shall mean the projects pursuant to subsection 10(f)(1) of this Act and described in subparagraph 12.2.1 of the settlement agreement.

(70) NAVAJO NATION WATER PROJECTS TRUST FUND ACCOUNT. The term “Navajo Nation Water Projects Trust Fund Account” shall mean the account created pursuant to subsection 10(b)(1) of this Act and described in subparagraph 12.2.1 of the settlement agreement.

(71) NAVAJO RESERVATION. The term “Navajo Reservation” means those lands shown on the map attached as Exhibit 3.1.112a to the settlement agreement, which are: within the exterior boundaries of the “Navajo Indian Reservation” in the State, defined by the Act of June 14, 1934, ch. 521, 48 Stat. 960; all lands withdrawn by the Executive Order of Dec. 16, 1882 and partitioned to the Navajo Nation in accordance with the Act of Dec. 22, 1974, Pub. L. 93-531, § 8(b), 88 Stat. 1713 (previously codified as amended at 25 U.S.C. § 640d-7(b)), by Judgment of Partition, Feb. 10, 1977, *Sekaquaptewa v. MacDonald*, Case No. CIV-579-PCT-

JAW (D. Ariz.), *aff'd*, 626 F.2d 113 (9th Cir. 1980); all lands taken into trust as a part of the Navajo Reservation pursuant to the Act of Dec. 22, 1974, Pub. L. No. 93-531, § 11, 88 Stat. 1713, as amended (previously codified at 25 U.S.C. § 640d-10, a copy of which is attached as Exhibit 3.1.112b to the settlement agreement); and excepting all lands within the Hopi Reservation and the San Juan Southern Paiute Reservation; provided, however, that if lands are taken in to trust as part of the Navajo Reservation pursuant to the Act of December 22, 1974, Pub. L. No. 93-531, and subsequent to the Effective Date, such lands shall be considered part of the Navajo Reservation as if they had been reservation lands prior to the Effective Date, except as provided in subparagraphs 3.1.12, 3.1.13, 3.1.87, 3.1.170, 4.1.5, 4.1.6, 4.6.1, and 8.1.1 of the settlement agreement.

(72) NAVAJO TRIBAL UTILITY AUTHORITY OR NTUA. The terms “Navajo Tribal Utility Authority” or “NTUA” mean the enterprise established by the Navajo Nation found at 21 Navajo Nation Code § 1 *et seq.*, or its successor agency or entity.

(73) NAVAJO TRUST LAND. The term “Navajo Trust Land” means land that:

- (A) is located in the State;
- (B) is located outside the exterior boundaries of the Navajo Reservation; and
- (C) as of the Enforceability Date, is held in trust by the United States for the benefit of the Navajo Nation.

(74) NORTHWESTERN NEW MEXICO RURAL WATER PROJECTS ACT. The term “Northwestern New Mexico Rural Water Projects Act” shall mean Title X.B of the Omnibus Public Land Management Act of 2009, Public Law 111-11, as amended.

(75) OFF-RESERVATION. The term “Off-Reservation” means lands located in the State outside the exterior boundaries of:

- (A) the Navajo Reservation;
- (B) the Hopi Reservation; and
- (C) the San Juan Southern Paiute Reservation.

(76) OM&R. The term “OM&R” means operation, maintenance, and replacement.

(77) PARTY OR PARTIES. The terms “Party” or “Parties” mean a Person who is a signatory or Persons who are signatories to the settlement agreement.

(78) PERSON. The term “Person” means an individual; public or private corporation; company; partnership; joint venture; firm; association; society; estate or trust; any other private organization or enterprise; the United States; any Indian tribe; any state, territory, or country; any governmental entity; and any political subdivision or municipal corporation organized under or subject to the constitution and laws of the State. This definition includes the officers, directors, agents, insurers, representatives, employees, attorneys, assigns, subsidiaries, affiliates, enterprises, legal representatives, assigns, predecessors, and successors in interest and their heirs, of any Person.

(79) PUBLIC DOMAIN ALLOTTEE. The term “Public Domain Allottee” means an individual Indian or an Indian tribe holding a beneficial interest in a Public Domain Allotment outside the Navajo Reservation or a Public Domain Allotment within the Navajo Reservation.

(80) PUBLIC DOMAIN ALLOTMENTS WITHIN THE NAVAJO RESERVATION. The term “Public Domain Allotments within the Navajo Reservation” means lands allotted to individual Indians from the public domain that are (1) held in trust by the

United States for the benefit of one or more individual Indians or Indian tribes and (2) located within the exterior boundaries of the Navajo Reservation. A list of Public Domain Allotments within the Navajo Reservation is attached as Exhibit 3.1.131 to the settlement agreement.

(81) PUBLIC DOMAIN ALLOTMENTS OUTSIDE THE NAVAJO RESERVATION. The term “Public Domain Allotments outside the Navajo Reservation” means the 51 parcels of land allotted to individual Indians from the public domain pursuant to Section 4 of the General Allotment Act of 1887, 24 Stat. 388, ch. 119 that are (1) held in trust by the United States for the benefit of one or more individual Indians or Indian tribes and (2) located outside the exterior boundaries of the Navajo Reservation and the Hopi Reservation, as depicted on the map attached as Exhibit 3.1.132A to the settlement agreement.

(82) RECLAMATION. The term “Reclamation” means the United States Bureau of Reclamation.

(83) SAN JUAN SOUTHERN PAIUTE FEE LAND. The term “San Juan Southern Paiute Fee Land” means land, other than San Juan Southern Paiute Trust Land, that:

- (A) is located in the State;
- (B) is located outside the exterior boundaries of the San Juan Southern Paiute Reservation; and
- (C) as of the Enforceability Date, is owned by the San Juan Southern Paiute Tribe, whether in its own name or through an entity wholly owned or controlled by the San Juan Southern Paiute Tribe.

(84) SAN JUAN SOUTHERN PAIUTE GROUNDWATER PROJECTS. The term “San Juan Southern Paiute Groundwater Projects” means the projects described in section 12 of this Act and in subparagraph 12.4.1 of the settlement agreement.

(85) SAN JUAN SOUTHERN PAIUTE LAND. The term “San Juan Southern Paiute Land” means collectively, the San Juan Southern Paiute Southern Area, San Juan Southern Paiute Trust Land, and San Juan Southern Paiute Fee Land.

(86) SAN JUAN SOUTHERN PAIUTE NORTHERN AREA. The term “San Juan Southern Paiute Northern Area” means the land depicted on the map attached as Exhibit 3.1.146 to the settlement agreement.

(87) SAN JUAN SOUTHERN PAIUTE TRIBE AGRICULTURAL CONSERVATION TRUST FUND ACCOUNT. The term “San Juan Southern Paiute Tribe Agricultural Conservation Trust Fund Account” means the account created pursuant to section 12(f)(2) of this Act and described in subparagraph 12.4.3 of the settlement agreement.

(88) SAN JUAN SOUTHERN PAIUTE TRIBE GROUNDWATER PROJECT TRUST FUND ACCOUNT. The term “San Juan Southern Paiute Tribe Groundwater Project Trust Fund Account” means the account created pursuant to section 12(f)(1) of this Act and described in subparagraph 12.4.1 of the settlement agreement.

(89) SAN JUAN SOUTHERN PAIUTE TRIBE OM&R TRUST FUND ACCOUNT. The term “San Juan Southern Paiute Tribe OM&R Trust Fund Account” means the account created pursuant to section 12(f)(3) of this Act and described in subparagraph 12.4.2 of the settlement agreement.

(90) SAN JUAN SOUTHERN PAIUTE SOUTHERN AREA. The term “San Juan Southern Paiute Southern Area” means the land depicted on the map attached as Exhibit 3.1.150 to the settlement agreement.

(91) SAN JUAN SOUTHERN PAIUTE RESERVATION. The term “San Juan Southern Paiute Reservation” means the approximately 5,400 acres of land described in paragraph 6.0 of the settlement agreement as the San Juan Southern Paiute Northern Area and the San Juan Southern Paiute Southern Area, as depicted in the maps attached as Exhibits 3.1.149 and 3.1.150 to the settlement agreement.

(92) SAN JUAN SOUTHERN PAIUTE TRIBE. The term “San Juan Southern Paiute Tribe” means the San Juan Southern Paiute Tribe, a body politic and federally recognized Indian tribe, 89 Fed. Reg. 944, 946 (Jan. 8, 2024).

(93) SAN JUAN SOUTHERN PAIUTE TRUST LAND. The term “San Juan Southern Paiute Trust Land” means land that:

- (A) is located in the State;
- (B) is located outside the exterior boundaries of the San Juan Southern Paiute Reservation; and
- (C) as of the Enforceability Date, is held in trust by the United States for the benefit of the San Juan Southern Paiute Tribe.

(94) SECRETARY. The term “Secretary” means the Secretary of the United States Department of the Interior or the Secretary’s authorized designee.

(95) SETTLEMENT AGREEMENT. The term “settlement agreement” means the Northeastern Arizona Indian Water Rights Settlement Agreement and the Exhibits attached thereto.

(96) SIXTH PRIORITY WATER. The term “Sixth Priority Water” shall mean Sixth Priority Water as that term is defined in the Hopi Tribe Existing Cibola Contract.

(97) STATE. The term “State” means the State of Arizona.

(98) SURFACE WATER. The term “Surface Water” means all water in the State that is appropriable under State law. “Surface Water” shall not include Colorado River Water.

(99) TREATY. The term “Treaty” means the Articles of Treaty and Agreement entered into by the Navajo Nation and the San Juan Southern Paiute Tribe to settle land claims and other disputes, as executed on March 18, 2000.

(100) TREATY ADDENDUM. The term “Treaty Addendum” means the Addendum to the Treaty entered into by the Navajo Nation and the San Juan Southern Paiute Tribe on May 7, 2004.

(101) TRIBE. The term “Tribe” means:

- (A) the Navajo Nation;
- (B) the Hopi Tribe; or
- (C) the San Juan Southern Paiute Tribe.

(102) TRIBES. The term “Tribes” means:

- (A) the Navajo Nation,
- (B) the Hopi Tribe, and
- (C) the San Juan Southern Paiute Tribe.

(103) UNDERGROUND WATER. The term “Underground Water” means all Water beneath the surface of the earth, within the State, other than Effluent, regardless of its legal characterization as appropriable or non-appropriable under Federal, State, or other law.

(104) UNITED STATES OR UNITED STATES OF AMERICA. The terms “United States” or “United States of America” mean the United States acting as trustee for the Tribes, their Members, Hopi Allottees, and Navajo Allottees, except as

otherwise expressly provided. When the term ‘United States’ or ‘United States of America’ is used in reference to a particular agreement or contract, the term shall mean the United States acting in the capacity as set forth in such agreement or contract.

(105) UPPER BASIN. The term “Upper Basin” means ‘Upper Basin’ as defined in article II(f) of the Colorado River Compact of 1922.

(106) UPPER BASIN COLORADO RIVER WATER. The term “Upper Basin Colorado River Water” means the 50,000 afy of consumptive use of Colorado River Water apportioned to the State in the Upper Colorado River Basin Compact of 1948, as ratified and reprinted in article 3 of chapter 7 of title 45, Arizona Revised Statutes.

(107) USE. The term “Use” means any beneficial use, including instream flow, recharge, storage, recovery, or any other use recognized as beneficial under applicable law.

(108) WATER. The term “water”, when used without a modifying adjective, means Groundwater, Surface Water, Colorado River Water, or Effluent.

(109) WATER RIGHT. The term “Water Right” means any right in or to Groundwater, Surface Water, Colorado River Water, or Effluent under Federal, State, or other law.

(110) WELL. The term “Well” means a human-made opening in the Earth through which Underground Water may be withdrawn or obtained.

(111) YEAR. The term “Year” means a calendar year.

(112) ZUNI INDIAN TRIBE OR ZUNI TRIBE. The terms “Zuni Indian Tribe” or “Zuni Tribe” mean the body politic and federally recognized Indian tribe of that name, 89 Fed. Reg. 944, 947 (Jan. 8, 2024).

**SEC. 4. RATIFICATION AND EXECUTION OF THE NORTHEASTERN ARIZONA INDIAN WATER RIGHTS SETTLEMENT AGREEMENT.**

(a) RATIFICATION.

(1) IN GENERAL. Except as modified by this Act and to the extent the settlement agreement does not conflict with this Act, the settlement agreement is authorized, ratified, and confirmed.

(2) AMENDMENTS. If an amendment to the settlement agreement, or to any Exhibit attached to the settlement agreement requiring the signature of the Secretary, is executed in accordance with this Act to make the settlement agreement consistent with this Act, the amendment is authorized, ratified, and confirmed, to the extent the amendment is consistent with this Act.

(b) EXECUTION OF SETTLEMENT AGREEMENT.

(1) IN GENERAL. To the extent the settlement agreement does not conflict with this Act, the Secretary shall execute the settlement agreement, including all exhibits to the settlement agreement requiring the signature of the Secretary.

(2) MODIFICATIONS. Nothing in this Act prohibits the Secretary from approving any modification to the settlement agreement, including exhibits to the settlement agreement, which is consistent with this Act, to the extent the modification does not otherwise require congressional approval under section 2116 of the Revised Statutes

(25 U.S.C. 177) or any other applicable provision of Federal law.

(c) ENVIRONMENTAL COMPLIANCE.

(1) IN GENERAL. In implementing the settlement agreement (including all exhibits to the settlement agreement requiring the signature of the Secretary) and this Act, the Secretary shall comply with all applicable provisions of:

(A) the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*);

(B) the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), including the implementing regulations of that Act; and

(C) all other Federal environmental laws and regulations.

(2) COMPLIANCE.

(A) IN GENERAL. In implementing the settlement agreement and this Act, and excluding environmental compliance related to the iiná bá - paa tuwaqat'si pipeline, the applicable tribe shall prepare any necessary environmental documents consistent with all applicable provisions of:

(i) the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*);

(ii) the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), including the implementing regulations of that Act; and

- (iii) all other Federal environmental laws and regulations.
- (d) AUTHORIZATIONS. The Secretary shall:
  - (1) independently evaluate the documentation submitted under subparagraph (c)(2)(A); and
  - (2) be responsible for the accuracy, scope, and contents of that documentation.
- (e) EFFECT OF EXECUTION. The execution of the settlement agreement by the Secretary under this section shall not constitute a major action for purposes of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*).
- (f) COSTS. Excluding compliance related to the iiná bá - paa tuwaqat'si pipeline, any costs associated with the performance of the compliance activities under subsection (c) shall be paid from funds deposited in the Navajo Nation Water Projects Trust Fund Account, the Hopi Tribe Groundwater Projects Trust Fund Account, or the San Juan Southern Paiute Tribe Groundwater Project Trust Fund Account, whichever is applicable, subject to the condition that any costs associated with the performance of Federal approval or other review of such compliance work or costs associated with inherently Federal functions shall remain the responsibility of the Secretary. Costs associated with the performance of the compliance activities under subsection (c) related to the iiná bá - paa tuwaqat'si pipeline shall be paid from funds deposited in the iiná bá - paa tuwaqat'si pipeline Implementation Fund Account.

**SEC. 5. WATER RIGHTS.**

(a) CONFIRMATION OF WATER RIGHTS.

(1) IN GENERAL. The Water Rights of the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, the Navajo Allottees, and the Hopi Allottees as set forth in the settlement agreement are ratified, confirmed, and declared to be valid.

(2) USE. Any use of water pursuant to the Water Rights described in subsection (a)(1) by the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, the Navajo Allottees, and the Hopi Allottees shall be subject to the terms and conditions of the settlement agreement and this Act.

(3) CONFLICT. In the event of a conflict between the settlement agreement and this Act, this Act shall control.

(b) INTENT OF CONGRESS. It is the intent of Congress to provide to Navajo Allottees benefits that are equivalent to, or exceed, the benefits the Navajo Allottees possess on the day before the date of enactment of this Act, taking into consideration:

(1) the potential risks, cost, and time delay associated with litigation that would be resolved by the settlement agreement and this Act;

(2) the availability of funding under this Act and from other sources;

- (3) the availability of water from the Water Rights of the Navajo Nation; and
  - (4) the applicability of section 7 of the Act of February 8, 1887, (25 U.S.C. 381) and this Act to protect the interests of Navajo Allottees.
- (c) WATER RIGHTS TO BE HELD IN TRUST FOR THE TRIBES, THE NAVAJO ALLOTTEES, AND THE HOPI ALLOTTEES. The United States shall hold the following Water Rights in trust for the benefit of the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, the Navajo Allottees, and the Hopi Allottees:
- (1) NAVAJO NATION AND THE NAVAJO ALLOTTEES. The United States shall hold the following Water Rights in trust for the benefit of the Navajo Nation and Navajo Allottees:
    - (A) Underground Water described in subparagraph 4.2 of the settlement agreement;
    - (B) Springs described in subparagraph 4.4 of the settlement agreement;
    - (C) Little Colorado River tributary water described in sub-paragraph 4.5 of the settlement agreement;
    - (D) Little Colorado River Mainstem water described in subparagraph 4.6 of the settlement agreement;

- (E) Navajo Nation Upper Basin Colorado River Water described in sub-paragraph 4.7 of the settlement agreement;
  - (F) Navajo Nation Fourth Priority Water described in subparagraph 4.9 of the settlement agreement; and
  - (G) Water Rights appurtenant or associated with lands held in trust by the United States for the benefit of the Navajo Nation as described in subparagraphs 4.12, 4.13, 4.15, and 4.16 of the settlement agreement.
- (2) HOPI TRIBE. The United States shall hold the following Water Rights in trust for the benefit of the Hopi Tribe:
- (A) Underground Water described in subparagraph 5.2 of the settlement agreement;
  - (B) Surface Water described in subparagraph 5.4 of the settlement agreement;
  - (C) Springs described in subparagraph 5.5 of the settlement agreement;
  - (D) Hopi Tribe Upper Basin Colorado River Water as described in subparagraph 5.7 of the settlement agreement; and
  - (E) Water Rights appurtenant or associated with lands held in trust by the United States for the benefit of the Hopi Tribe as described in subparagraphs 5.10, 5.11, 5.12, and 5.13 of the settlement agreement.

- (3) SAN JUAN SOUTHERN PAIUTE TRIBE. The United States shall hold the following Water Rights in trust for the benefit of the San Juan Southern Paiute Tribe:
  - (A) Underground Water described in subparagraph 6.2.3 of the settlement agreement;
  - (B) Surface Water described in subparagraph 6.2.4 of the settlement agreement;
  - (C) Springs described in subparagraph 6.2.6 of the settlement agreement; and
  - (D) Water Rights appurtenant or associated with lands held in trust by the United States for the benefit of the San Juan Southern Paiute Tribe as described in subparagraphs 6.5 and 6.6 of the settlement agreement.
- (4) HOPI ALLOTTEES. The United States shall hold the Water Rights described in subparagraph 5.9 of the settlement agreement in trust for the benefit of the Hopi allottees.
- (d) NONUSE, FORFEITURE, AND ABANDONMENT.
  - (1) Water Rights of the Navajo Nation and the Navajo Allottees described in subparagraphs 4.2, 4.4, 4.5, 4.6, 4.7, and 4.9 of the settlement agreement shall not be subject to loss by non-use, forfeiture, or abandonment;
  - (2) Water Rights of the Hopi Tribe described in subparagraphs 5.2, 5.4, 5.5, and 5.7 of the settlement agreement, and Water Rights pertaining to lands held in trust

by the United States for the benefit of the Hopi Tribe as described in subparagraphs 5.10, 5.11, 5.12, and 5.13 of the settlement agreement, shall not be subject to loss by non-use, forfeiture, or abandonment;

- (3) Water Rights of the San Juan Southern Paiute Tribe described in subparagraphs 6.2.3, 6.2.4, and 6.2.6 of the settlement agreement shall not be subject to loss by non-use, forfeiture, or abandonment.
  - (4) Water Rights of the Hopi Allottees described in subparagraph 5.9 of the settlement agreement shall not be subject to loss by non-use, forfeiture, or abandonment.
- (e) NAVAJO ALLOTTEES.
- (1) APPLICABILITY OF THE ACT OF FEBRUARY 8, 1887. The provisions of section 7 of the Act of February 8, 1877, 24 Stat. 390, ch. 119; 25 U.S.C. § 381, shall apply to the Water Rights identified in subsection (c)(1).
  - (2) ENTITLEMENT TO WATER. The rights of Navajo Allottees, and the United States acting as trustee for Navajo Allottees, to use water on Navajo Allotments located on the Navajo Reservation shall be satisfied solely from the Water Rights described in subsection (c)(1).
  - (3) ALLOCATIONS. A Navajo Allottee shall be entitled to a just and equitable distribution of water for irrigation purposes.

- (4) CLAIMS.
  - (A) EXHAUSTION OF REMEDIES. Before asserting any claim against the United States under section 7 of the Act of February 8, 1887, 24 Stat. 390, ch. 199; 25 U.S.C. § 381, or any other applicable law, a Navajo Allottee shall exhaust remedies available under the Navajo Nation Water Code or other applicable Navajo law.
  - (B) ACTION FOR RELIEF. After the exhaustion of all remedies available under the Navajo Nation Water Code or other applicable Navajo law, a Navajo Allottee may seek relief under section 7 of the Act of February 8, 1887, 24 State. 390, ch. 119; 25 USC § 381, or other applicable law.
- (5) AUTHORITY OF THE SECRETARY. The Secretary shall have authority to protect the rights of Navajo Allottees in accordance with this subsection.
- (f) NAVAJO NATION WATER CODE. To the extent necessary, and subject to the approval of the Secretary, the Navajo Nation shall amend the Navajo Nation Water Code to provide
  - (1) that use of Water by Navajo Allottees shall be satisfied with water from the Water Rights described in subsection (c)(1);
  - (2) a process by which a Navajo Allottee may request that the Navajo Nation provide water in accordance with the settlement agreement, including the provision of water

under any Navajo Allottee lease under section 4 of the Act of June 25, 1910, 36 Stat. 856, ch. 431; 25 U.S.C. § 403;

(3) a due process system for the consideration and determination by the Navajo Nation of any request of a Navajo Allottee (or a successor in interests to a Navajo Allottee) for an allocation of water on a Navajo Allotment, including a process for:

(A) appeal and adjudication of any denied or disputed distribution of water; and

(B) resolution of any contested administrative decision; and

(4) a requirement that any Navajo Allottee asserting a claim relating to the enforcement of rights of the Navajo Allottee under the Navajo Nation Water Code, including to the quantity of water allocated to land of the Navajo Allottee, shall exhaust all remedies available to the Navajo Allottee under Navajo law before initiating an action against the United States or petitioning the Secretary pursuant to subparagraph (e)(4)(B).

(g) ACTION BY THE SECRETARY.

(1) IN GENERAL. During the period beginning on the Enactment Date and ending on the date on which a Navajo Nation Water Code is amended as described in paragraph (f)(1) of this section, the Secretary shall administer, with respect to the rights of the Navajo Allottees, the Water Rights identified in subsection (c)(1).

- (2) APPROVAL. The Navajo Nation Water Code amendments described in paragraph (f)(1) of this section shall not be valid unless:
  - (A) the amendments described in paragraph (f)(1) of this section have been approved by the Secretary; and
  - (B) each subsequent amendment to the Navajo Nation Water Code that affects the rights of a Navajo Allottee is approved by the Secretary.
- (3) APPROVAL PERIOD.
  - (A) APPROVAL PERIOD. The Secretary shall approve or disapprove the Navajo Nation Water Code amendments described in paragraph (f)(1) of this section not later than 180 days after the date on which the amendments are submitted to the Secretary.
  - (B) EXTENSION. This deadline may be extended by the Secretary after consultation with the Navajo Nation.
- (h) EFFECT. Except as otherwise expressly provided in this section, nothing in this Act:
  - (1) authorizes any action by a Navajo Allottee against any individual or entity, or against the Navajo Nation, under Federal, State, tribal, or local law; or
  - (2) alters or affects the status of any action brought pursuant to section 1491(a) of title 28, United States Code.

**SEC. 6. ALLOCATION AND ASSIGNMENT OF COLORADO RIVER WATER TO THE TRIBES; WATER DELIVERY CONTRACTS.**

(a) ALLOCATION AND ASSIGNMENT TO THE NAVAJO NATION AND THE HOPI TRIBE.

(1) ALLOCATION AND ASSIGNMENT TO THE NAVAJO NATION.

(A) NAVAJO NATION UPPER BASIN COLORADO RIVER WATER. Forty-four Thousand Seven Hundred (44,700) afy of Upper Basin Colorado River Water is allocated to the Navajo Nation upon the enforceability date. Pursuant to subparagraph 4.7.1 of the settlement agreement, the State has expressly agreed to this allocation.

(B) NAVAJO NATION CIBOLA WATER. Pursuant to subparagraph 4.8.2 of the settlement agreement, the State has recommended the assignment of Navajo Nation Cibola Water by the Hopi Tribe to the Navajo Nation effective on the enforceability date.

(C) NAVAJO NATION FOURTH PRIORITY WATER. Three Thousand Five Hundred (3,500) afy of uncontracted Fourth Priority Water reserved for use in a Navajo-Hopi Indian Water Rights settlement under paragraph 11.3 of the Arizona Water Settlement Agreement among the United States, the State, and CAWCD, as authorized by Section 106(a)(1) and (2) of Public Law 108-451, is allocated

to the Navajo Nation upon the enforceability date. Pursuant to subparagraph 4.9.1 of the settlement agreement, the State has recommended the allocation.

(2) ALLOCATION TO HOPI TRIBE AND AMENDMENT TO CIBOLA CONTRACT.

(A) ARIZONA HOPI TRIBE UPPER BASIN COLORADO RIVER WATER. Two Thousand Three Hundred (2,300) afy of Upper Basin Colorado River Water is allocated to the Hopi Tribe upon the enforceability date. Pursuant to subparagraph 5.7.1 of the settlement agreement, the State has expressly agreed to this allocation.

(B) HOPI TRIBE CIBOLA WATER. Pursuant to subparagraph 5.8.1 of the settlement agreement, the State has recommended the amendment of the existing Hopi Tribe Cibola Contract to reduce the Hopi Tribe's fourth priority water diversion entitlement to 4,178 afy, and to provide for additional uses and places of use of Hopi Tribe Cibola Water, effective on the enforceability date.

(b) COLORADO RIVER WATER USE AND STORAGE.

(1) IN GENERAL.

(A) NAVAJO NATION UPPER BASIN COLORADO RIVER WATER AND HOPI TRIBE UPPER BASIN COLORADO RIVER WATER. Navajo Nation Upper Basin Colorado River Water may be used at

any location within the State; and Hopi Tribe Upper Basin Colorado River Water may be used at any location within the State.

(B) NAVAJO NATION CIBOLA WATER, NAVAJO NATION FOURTH PRIORITY WATER, AND HOPI TRIBE CIBOLA WATER. The Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water and Hopi Tribe Cibola Water may be used at any location within the State.

(C) STORAGE IN ARIZONA. Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water may be stored at underground storage facilities or groundwater savings facilities located:

- (i) within the Navajo Reservation in accordance with Navajo law, or State law if mutually agreed to by the Navajo Nation and the State;
- (ii) within the Hopi Reservation in accordance with Hopi law, or State law if mutually agreed to by the Hopi Tribe and the State;
- (iii) on any other Indian reservation located in the State in accordance with applicable law; and

- (iv) within the State and outside of any Indian reservation in accordance with State law.
  - (v) The Navajo Nation and the Hopi Tribe may assign any long-term storage credits accrued as a result of storage under this subparagraph in accordance with applicable law. Any water stored pursuant to tribal law may only be recovered on the Indian reservation where the water was stored.
- (D) TRANSPORTATION OF WATER THROUGH THE CAP SYSTEM. The Navajo Nation or the Hopi Tribe may transport Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, Hopi Tribe Upper Basin Colorado River Water, and Hopi Tribe Cibola Water through the CAP system for storage or use in accordance with all laws of the United States and the agreements between the United States and CAWCD governing the use of the CAP system to transport water other than CAP Water, subject to payment of applicable charges.
- (2) STORAGE IN NEW MEXICO. The Navajo Nation may store its Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, and Navajo Nation Fourth Priority Water at the Navajo Reservoir and at the Frank Chee Willetto, Sr. Reservoir in New Mexico so long as the Water

stored there is subsequently transported to the State for use in the State.

- (A) Any storage of Navajo Nation Upper Basin Colorado River Water in the Navajo Reservoir or the Frank Chee Willetto, Sr. Reservoir shall be credited against Upper Basin Colorado River Water in the year in which the diversions for storage in the Reservoir occurs. Such Water shall be accounted for and reported by the Secretary separately from any other water stored in the Navajo Reservoir or the Frank Chee Willetto, Sr. Reservoir.
  - (B) Any storage of Navajo Nation Cibola Water or Navajo Nation Fourth Priority Water in the Navajo Reservoir or the Frank Chee Willetto, Sr. Reservoir shall be credited against the State's apportionment of Lower Basin Colorado River Water in the year in which the diversion for storage in the Navajo Reservoir or Frank Chee Willetto, Sr. Reservoir occurs. Such Water shall be accounted for and reported by the Secretary separately from any other water stored in the Navajo Reservoir or the Frank Chee Willetto, Sr. Reservoir.
- (3) NO USE OUTSIDE ARIZONA.
- (A) The Navajo Nation may divert its Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, and Navajo Nation Fourth Priority

Water in Arizona, New Mexico, and Utah, but, with the exception of storage in the Navajo Reservoir and Frank Chee Willetto, Sr. Reservoir described in subparagraph (2), the Navajo Nation may not use, lease, exchange, forbear, or otherwise transfer any of the water for use directly or indirectly outside of the State.

(B) The Hopi Tribe may divert its Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water in Arizona, and the Hopi Tribe may not use, lease, exchange, forbear, or otherwise transfer any of the water for use directly or indirectly outside of the State.

(4) All contracts to store Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, Hopi Tribe Upper Basin Colorado River Water or Hopi Tribe Cibola Water shall identify: (a) the water's place of storage; (b) the mechanisms for delivery of the water; and (c) each point of Diversion under the contract. A contract to store Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, Hopi Tribe Upper Basin Colorado River Water or Hopi Tribe Cibola Water shall not conflict with the settlement agreement or this Act.

- (c) WATER DELIVERY CONTRACTS. The Secretary shall enter into the following Water delivery contracts, which contracts shall be without limit as to term:
  - (1) NAVAJO NATION WATER DELIVERY CONTRACTS FOR NAVAJO NATION UPPER BASIN COLORADO RIVER WATER
    - (A) The Secretary shall enter into a water delivery contract with the Navajo Nation for Navajo Nation Upper Basin Colorado River Water in accordance with the settlement agreement, which shall provide for, among other things:
      - (i) the delivery of up to 44,700 afy of Navajo Nation Upper Basin Colorado River Water;
      - (ii) one or more points of Diversion in Arizona, New Mexico, and Utah;
      - (iii) one or more storage locations at any place within the State and the Navajo Reservoir and the Frank Chee Willetto, Sr. Reservoir in New Mexico;
      - (iv) use at any location within the State; and
      - (v) delivery of Navajo Nation Upper Basin Colorado River Water to the Navajo Nation's lessees and exchange partners in the Upper Basin and the Lower Basin within the State.
    - (B) Water Service Contract No. 09-WC-40-318 between the United States and the Navajo Nation dated

December 23, 2009 for the delivery of up to 950 afy of Water from Lake Powell to the Navajo Nation for municipal and industrial Use within the Community of LeChee shall be replaced with a Navajo Nation Water Delivery Contract for the delivery of Navajo Nation Upper Basin Colorado River Water that complies with this subsection. As provided in the settlement agreement, upon the Enforceability Date, Water Service Contract No. 09-WC-40-318 shall terminate.

- (2) NAVAJO NATION WATER DELIVERY CONTRACT FOR NAVAJO NATION CIBOLA WATER. The Secretary shall enter into a water delivery contract with the Navajo Nation for the Navajo Nation Cibola Water in accordance with the settlement agreement which shall provide for, among other things:
  - (A) the Diversion of up to 100 afy at the location and for the same uses described in the Hopi Tribe Existing Cibola Contract; or delivery and consumptive use of up to 71.5 afy at locations and for Uses within the State other than as described in the Hopi Tribe Existing Cibola Contract;
  - (B) one or more points of Diversion in Arizona, New Mexico, and Utah;

- (C) storage in any location within the State and in the Navajo Reservoir and the Frank Chee Willetto, Sr. Reservoir in New Mexico;
- (D) use at any location within the State;
- (E) delivery of Navajo Nation Cibola Water to the Navajo Nation's lessees and exchange partners in the Upper Basin and the Lower Basin within the State; and
- (F) curtailment as provided in subsection (e).

(3) NAVAJO NATION WATER DELIVERY CONTRACT FOR NAVAJO NATION FOURTH PRIORITY WATER.

The Secretary shall enter into a water delivery contract with the Navajo Nation for Navajo Nation Fourth Priority Water in accordance with the settlement agreement which shall provide for, among other things:

- (A) delivery of up to 3,500 afy of Navajo Nation Fourth Priority Water;
- (B) one or more points of Diversion in Arizona, New Mexico, and Utah;
- (C) storage in any location in Arizona and in the Navajo Reservoir and the Frank Chee Willetto, Sr. Reservoir in New Mexico;
- (D) use at any location within the State;
- (E) delivery of Navajo Nation Fourth Priority Water to the Navajo Nation's lessees and exchange partners in

the Upper Basin and the Lower Basin within the State; and

(F) curtailment as provided in subsection (e).

(4) HOPI TRIBE DELIVERY CONTRACTS FOR HOPI TRIBE UPPER BASIN COLORADO RIVER WATER.

The Secretary shall enter into a water delivery contract with the Hopi Tribe for Hopi Tribe Upper Basin Colorado River Water in accordance with the settlement agreement, which shall provide for, among other things:

(A) the delivery of up to 2,300 afy of Hopi Tribe Upper Basin Colorado River Water;

(B) one or more points of diversion in the State, including Lake Powell;

(C) one or more storage locations at any place within the State;

(D) use at any location within the State; and

(E) delivery of Hopi Tribe Upper Basin Colorado River Water to the Hopi Tribe's lessees and exchange partners in the Upper Basin and the Lower Basin within the State.

(5) HOPI TRIBE WATER DELIVERY CONTRACT FOR HOPI TRIBE CIBOLA WATER.

The Secretary shall enter into a water delivery contact with the Hopi Tribe for Hopi Tribe Cibola Water in accordance with the settlement agreement, which shall provide for, among other things:

- (A) the delivery of up to 4,178 afy of fourth priority water, 750 afy of fifth priority water, and 1,000 afy of sixth priority water;
  - (B) one or more points of diversion in the State, including Lake Powell;
  - (C) storage in any location within the State;
  - (D) use at any location within the State consistent with subparagraph 5.8.3 of the settlement agreement;
  - (E) delivery of Hopi Tribe Cibola Water to the Hopi Tribe's lessees and exchange partners in the Upper Basin and Lower Basin within the State; and
  - (F) curtailment as provided in subsection (e).
- (d) REQUIREMENTS AND LIMITATIONS APPLICABLE TO WATER DELIVERY CONTRACTS.

The Navajo Nation Water Delivery Contracts and Hopi Tribe Water Delivery Contracts described in subsection (c) shall be subject to the following requirements and limitations:

- (1) Except for storage by the Navajo Nation at the Navajo Reservoir and the Frank Chee Willetto, Sr. Reservoir in New Mexico, a Water delivery contract shall not permit the use of the Water outside of the State.
- (2) A water delivery contract shall not, either temporarily or permanently, alter or reduce the State's annual Lower Basin apportionment pursuant to the Boulder Canyon Project Act of 1928, 43 U.S.C. 617, *et seq.*, as amended, and the Decree,

or annual Upper Basin apportionment pursuant to the Upper Colorado River Basin Compact, as ratified and reprinted in article 3 of chapter 7 of title 45, Arizona Revised Statutes.

- (3) Nothing in a water delivery contract shall alter or impair the State's rights, authorities, and interests under the Boulder Canyon Project Act of 1928, 43 U.S.C. 617, *et seq.*, as amended, the contract between the United States and the State of Arizona dated February 9, 1944, or the Upper Colorado River Basin Compact of 1948, as ratified and reprinted in article 3 of chapter 7 of title 45, Arizona Revised Statutes, or the Decree.
- (4) A water delivery contract shall not limit the State's ability to seek or advocate changes in the Colorado River system's operating rules, criteria, or guidelines as they apply to the State's apportionments from the Upper Basin and the Lower Basin of the Colorado River.
- (5) In the event that a water delivery contract will result in the delivery of Upper Basin Colorado River Water to the Lower Basin or Lower Basin Colorado River Water to the Upper Basin, the Secretary shall confer with the State prior to executing such water delivery contract concerning: (a) the impact of the water deliveries on the availability of Upper Basin or Lower Basin Colorado River Water within the State; (b) Reclamation's annual accounting for such water on the State's Colorado River apportionments in the Upper

Basin and Lower Basin; and, if appropriate, (c) the impact on the operations of the Central Arizona Project.

- (6) A water delivery contract shall identify: (a) the place(s) of use; (b) the purpose of the use(s) during the term of the contract; (c) the mechanism(s) for delivery of the water; and (d) each point of diversion under the contract.
- (7) A water delivery contract shall not prejudice the interests of the State, or serve as precedent against the State, in any litigation related to the apportionment, diversion, storage, or use of water from the Colorado River system as defined in Article II(a) of the Decree.
- (8) In the case of a conflict between a water delivery contract and this Act or the settlement agreement, this Act or the settlement agreement shall control.
- (9) Any material amendment or modification of a water delivery contract shall comply with, and be subject to, all requirements and limitations for the water delivery contract as set forth in the settlement agreement and this Act.
- (10) A water delivery contract shall become effective on the Enforceability Date and, once effective, shall be permanent and without limit as to term.
- (11) The United States shall waive Colorado River Storage Project standby charges and delivery charges and annual administration fees for Water delivered pursuant to a water delivery contract.

(e) CURTAILMENT.

(1) NAVAJO NATION CIBOLA WATER AND NAVAJO NATION FOURTH PRIORITY WATER.

Deliveries of Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water, regardless of the point of diversion, shall be subject to reduction in any year in which a shortage is declared to the same extent as other non-CAP fourth priority Lower Basin Colorado River Water supplies.

(2) OTHER LOWER BASIN COLORADO RIVER WATER ACQUIRED BY THE NAVAJO NATION.

Any other Lower Basin Colorado River Water that the Navajo Nation may acquire shall be subject to reduction in any year in which a shortage is declared in accordance with criteria applied by the Secretary to Water of the same priority.

(3) HOPI TRIBE CIBOLA WATER.

(A) Deliveries of Hopi Tribe Cibola Water of fourth priority, regardless of the point of diversion, shall be subject to reduction in any year in which a shortage is declared to the same extent as other non-CAP fourth priority Lower Basin Colorado River Water supplies.

(B) Deliveries of Hopi Tribe Cibola Water of fifth priority, regardless of the point of diversion, shall be subject to reduction in any year in which a shortage is declared to the same extent as other fifth priority Lower Basin Colorado River Water supplies.

(4) OTHER LOWER BASIN COLORADO RIVER WATER ACQUIRED BY THE HOPI TRIBE.

Any other Lower Basin Colorado River Water that the Hopi Tribe may acquire shall be subject to reduction in any year in which a shortage is declared in accordance with criteria applied by the Secretary to water of the same priority.

(f) USE OF THE COLORADO RIVER MAINSTREAM AND SAN JUAN RIVER.

The Secretary is authorized to use the Colorado River Mainstream and dams and works on the Mainstream now or hereafter controlled or operated by the United States, which regulate the flow of water in the Mainstream or the diversion of water from the Mainstream in the Upper Basin or the Lower Basin to transport and deliver Navajo Nation Upper Basin Colorado River Water, Hopi Tribe Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, and Hopi Tribe Cibola Water. The Secretary is also authorized to use the San Juan River and the dams and works described in subparagraphs 4.7.5, 4.8.4, and 4.9.4 of the settlement agreement to transport, store, and deliver Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, and Navajo Nation Fourth Priority Water.

(1) Navajo Nation Upper Basin Colorado River Water or Hopi Tribe Upper Basin Colorado River Water which enters the Mainstream and dams and works on the Mainstream now or hereafter controlled or operated by the United States which regulate the flow of Water in the Mainstream or the

diversion of Water from the Mainstream in the Upper Basin or the Lower Basin of the United States of the Lower Colorado River, shall not be deemed water controlled by the United States under the Decree and shall be managed differently than Lower Basin Mainstream Water and be accounted for separately by the Secretary in a manner such that the Navajo Nation Upper Basin Colorado River Water or the Hopi Tribe's Upper Basin Colorado River Water is not subject to paragraphs II(A) or II(B) of the Decree.

- (2) Navajo Nation Upper Basin Colorado River Water that enters the San Juan River and the dams and works described in subparagraphs 4.7.5, 4.8.4, and 4.9.4 of the settlement agreement shall not be deemed water controlled by the United States and is not subject to the Decree provided that if Navajo Nation Upper Basin Colorado River Water spills from dams on the San Juan River described in subparagraphs 4.7.5, 4.8.4, and 4.9.4, it becomes part of the San Juan River system.
- (g) ACQUISITIONS OF ENERGY. Amounts of energy needed to deliver water to the Navajo Nation, the Hopi Tribe, or the San Juan Southern Paiute Tribe shall be acquired by the Tribes.
  - (h) REPORTING BY NAVAJO NATION AND HOPI TRIBE.
    - (1) NAVAJO NATION. Beginning on March 1 of the first year following the year in which the Enforceability Date occurs, and on March 1 of each year thereafter, the Navajo Nation shall submit a report to the Arizona Department of Water

Resources showing: (a) the annual diversion amount, point of diversion, and places of use of Navajo Nation Upper Basin Colorado River Water; (b) the annual diversion amount, point of diversion, and places of use of Navajo Nation Cibola Water; (c) the annual diversion amount, point of diversion, and places of use of Navajo Nation Fourth Priority Water; (d) the location and annual amount of any off-Reservation storage of Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water; (e) the amount of an off-Reservation exchange involving Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water; and (f) the location and annual amount of Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water leased off-Reservation. In order to accurately measure the flow of Water diverted in the Upper Basin for use by the Navajo Nation in the State, the Navajo Nation shall install suitable measuring devices at or near each point of diversion of Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water from the Colorado River's mainstem in the Upper Basin and the San Juan River in the Upper Basin. The Navajo Nation shall notify the Arizona Department of Water Resources in writing of any annual reporting conflicts between Reclamation, the Navajo Nation, or the Upper

Colorado River Commission prior to the completion of Reclamation's annual "Colorado River Accounting and Water Use Report for the Lower Basin."

- (2) HOPI TRIBE. Beginning on March 1 of the first year following the year in which the Enforceability Date occurs, and on March 1 of each year thereafter, the Hopi Tribe shall submit a report to the Arizona Department of Water Resources showing: (a) the annual diversion amount, point of diversion, and places of use of Hopi Tribe Upper Basin Colorado River Water; (b) the annual diversion amount, point of diversion, and places of use of Hopi Tribe Cibola Water; (c) the location and annual amount of any off-Reservation storage of Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water; (d) the amount of an off-Reservation exchange involving Hopi Tribe Upper Basin Colorado River Water or Hopi Tribe Cibola Water; and (e) the location and annual amount of Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water leased off-Reservation. In order to accurately measure the flow of Water diverted in the Upper Basin for use by the Hopi Tribe in the State, the Hopi Tribe shall install suitable measuring devices at or near each point of diversion of Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water from the Colorado River's mainstem in the Upper Basin. The Hopi Tribe shall notify the Arizona Department of Water Resources in writing of any annual

reporting conflicts between Reclamation, the Hopi Tribe, or the Upper Colorado River Commission prior to the completion of Reclamation's annual "Colorado River Accounting and Water Use Report for the Lower Basin."

**SEC. 7. COLORADO RIVER WATER LEASES AND EXCHANGES; USES.**

(a) IN GENERAL. Subject to approval by the Secretary:

(1) The Navajo Nation shall have authority to enter into leases, or options to lease, or exchanges, or options to exchange, Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, and Navajo Nation Fourth Priority Water, for use and storage in the State, and provide for the temporary delivery to other persons of any portion of Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, and Navajo Nation Fourth Priority Water in the State in accordance with the settlement agreement and all applicable Federal and State laws governing the transfer of Colorado River Water entitlements within the State.

(2) The Hopi Tribe shall have authority to enter into leases, or options to lease, or exchanges, or options to exchange, Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water for use and storage in the State, and provide for the temporary delivery to other persons of any portion of Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water in the State in accordance with the

settlement agreement and all applicable Federal and State laws governing the transfer of Colorado River Water entitlements within the State.

(b) TERMS OF LEASES AND EXCHANGES.

(1) LEASING – ON RESERVATION. The Navajo Nation may lease the Navajo Nation Upper Basin Colorado River Water, the Navajo Nation Cibola Water and the Navajo Nation Fourth Priority Water for use or storage on the Navajo Reservation and the Hopi Tribe may lease Hopi Tribe Upper Basin Colorado River Water, and Hopi Tribe Cibola Water for use or storage on the Hopi Reservation. Leases or options to lease under this subsection shall be subject to:

(A) the Navajo Nation or Hopi Tribe’s leasing regulations, whichever is applicable; and

(B) Federal provisions regarding the lease of restricted land (25 U.S.C. § 415(a) and (e)).

(2) LEASING – OFF RESERVATION. Subject to approval by the Secretary for an off Reservation lease:

(A) NAVAJO NATION LEASING. The Navajo Nation may lease Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, and Navajo Nation Fourth Priority Water for use or storage off of the Navajo Reservation anywhere within the State, in accordance with the settlement agreement and all applicable Federal and State laws

governing the transfer of Colorado River Water within the State.

- (B) HOPI TRIBE LEASING. The Hopi Tribe may lease Hopi Tribe Upper Basin Colorado River Water and Hopi Tribe Cibola Water for use or storage off of the Hopi Reservation anywhere within the State, in accordance with the settlement agreement and all applicable Federal and State laws governing the transfer of Colorado River Water within the State.
  - (C) TERM OF LEASES AND EXCHANGES. Contracts to lease and options to lease off of the Reservation shall be for a term not to exceed one hundred (100) years. Exchanges or options to exchange shall be for the term provided for in the exchange or option, as applicable.
  - (D) RENEGOTIATION; RENEWAL. The Navajo Nation and the Hopi Tribe may, with the approval of the Secretary, renegotiate any lease described in subsection (b)(2) at any time during the term of that lease provided the term of the renegotiated lease off of the Reservation does not exceed one hundred (100) years.
- (3) REQUIREMENTS FOR ALL CONTRACTS TO LEASE AND CONTRACTS TO EXCHANGE. All contracts to lease or exchange Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation

Fourth Priority Water, Hopi Tribe Upper Colorado River Water and Hopi Tribe Cibola Water shall:

- (A) identify the Water's places of use, the purpose of the Water's uses during the term of the contract, the mechanisms for delivery of the water, and each point of Diversion under the contract and
  - (B) a lease or exchange agreement under this subsection shall provide that the water received from the Navajo Nation or the Hopi Tribe, whichever applies, shall be used in accordance with applicable law.
- (4) NO CONFLICT WITH SETTLEMENT AGREEMENT OR THIS ACT. A contract to lease or exchange Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, Hopi Tribe Upper Basin Colorado River Water or Hopi Tribe Cibola Water shall not conflict with the settlement agreement or this Act.
- (c) PROHIBITION ON PERMANENT ALIENATION. No Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, Hopi Tribe Upper Basin Colorado River Water, or Hopi Tribe Cibola Water may be permanently alienated.
- (d) ENTITLEMENT TO LEASE AND EXCHANGE MONIES.
- (1) ENTITLEMENT. The Navajo Nation or the Hopi Tribe, as applicable, shall be entitled to all consideration due to the Navajo Nation or Hopi Tribe under any lease, option to

lease, exchange, or option to exchange Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, Hopi Tribe Upper Basin Colorado River Water, or Hopi Tribe Cibola Water entered into by the Navajo Nation or the Hopi Tribe.

(2) EXCLUSION. The United States shall not, in any capacity, be entitled to the consideration described in paragraph (1).

(3) OBLIGATION OF THE UNITED STATES. The United States shall not, in any capacity, have any trust or other obligation to monitor, administer, or account for, in any manner, any funds received by the Navajo Nation or the Hopi Tribe as consideration under any lease, option to lease, exchange, or option to exchange Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, Hopi Tribe Upper Basin Colorado River Water, and Hopi Tribe Cibola Water entered into by the Navajo Nation or the Hopi Tribe.

(e) DELIVERY OF COLORADO RIVER WATER TO LESSEES. All lessees of Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, Hopi Tribe Upper Basin Colorado River Water, and Hopi Tribe Cibola Water shall pay all OM&R charges, all energy charges, and all other applicable charges associated with the delivery of the leased Water.

- (f) DELIVERY OF COLORADO RIVER WATER THROUGH THE CAP SYSTEM.
- (1) CAWCD APPROVAL. The Navajo Nation, the Hopi Tribe, or any person who leases Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, Hopi Tribe Upper Basin Colorado River Water, and Hopi Tribe Cibola Water under subsection 7(a), may transport such Water through the CAP system in accordance with all laws of the United States and the agreements between the United States and CAWCD governing the use of the CAP system to transport Water other than CAP Water, and other applicable charges.
  - (2) LESSEE RESPONSIBILITY FOR CHARGES. Any lease or option to lease providing for the temporary delivery of Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, Hopi Tribe Upper Basin Colorado River Water, and Hopi Tribe Cibola Water through the CAP system shall require the lessee to pay the CAP operating agency all CAP fixed OM&R charges and all CAP pumping energy charges associated with the delivery of the leased Water, and other applicable charges.
  - (3) NO RESPONSIBILITY FOR PAYMENT. The Navajo Nation, the Hopi Tribe, and the United States acting in any capacity, shall not be responsible for the payment of any

charges associated with the delivery of Colorado River Water leased to others.

- (4) PAYMENT IN ADVANCE. No leased Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, Hopi Tribe Upper Basin Colorado River Water, and Hopi Tribe Cibola Water shall be delivered through the CAP system unless the CAP fixed OM&R charges, the CAP pumping energy charges, and other applicable charges associated with the delivery of such Water have been paid in advance.
- (5) CALCULATION. The charges for delivery of Navajo Nation Upper Basin Colorado River Water, Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, Hopi Tribe Upper Basin Colorado River Water, and Hopi Tribe Cibola Water delivered through the CAP system pursuant to a lease shall be calculated in accordance with the agreements between the United States and CAWCD governing the use of the CAP system to transport Water other than CAP Water.

**SEC. 8. THE IINÁ BÁ - PAA TUWAQAT'SI PIPELINE; CONSTRUCTION; OWNERSHIP.**

- (a) IINÁ BÁ - PAA TUWAQAT'SI PIPELINE.
  - (1) PLANNING, DESIGN, AND CONSTRUCTION OF THE IINÁ BÁ - PAA TUWAQAT'SI PIPELINE. The Secretary, acting through the Commissioner of Reclamation, shall plan, design, and construct the iiná bá - paa tuwaqat'si

pipeline. As provided in subparagraph 12.1.4 of the settlement agreement, the Secretary shall form a Project Construction Committee including the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe to participate in the planning and design of the iiná bá - paa tuwaqat'si pipeline to provide Water delivery to the Navajo Reservation, the Hopi Reservation, and the San Juan Southern Paiute Southern Area. The iiná bá – paa tuwaqat'si pipeline shall be substantially configured as Alternative 5, Option B-100 described in the Reclamation *Navajo-Hopi Value Planning Study – Arizona* dated October 2020 (Value Planning Draft Report for Presentation (Not for Distribution)). The iiná bá - paa tuwaqat'si pipeline may include components that have already been built or acquired by the Navajo Nation or the Hopi Tribe as a contribution by the Navajo Nation or the Hopi Tribe towards the cost of planning, designing, and constructing the pipeline. The iiná bá – paa tuwaqat'si pipeline shall deliver potable water for domestic, commercial, municipal and industrial uses and be capable of delivering from Lake Powell: (i) up to 7,100 afy of potable Colorado River Water to the Navajo Nation for use in delivering up to 6,750 afy to serve Navajo communities and up to 350 afy to serve the San Juan Southern Paiute Southern Area; and (ii) up to 3,076 afy of potable Colorado River Water to the Hopi Tribe for use in delivering up to 3,076 afy to serve Hopi communities. Construction of the iiná bá – paa tuwaqat'si pipeline shall

commence after environmental compliance, design, construction phasing, cost estimating, and value engineering have occurred, and the phasing of construction has been agreed to among the Secretary, the Navajo Nation, and the Hopi Tribe, with the Secretary deciding on phasing if an agreement is not reached.

- (2) OWNERSHIP. The iiná bá - paa tuwaqat'si pipeline shall be owned by the United States during construction. Upon substantial completion of all or a phase of the iiná bá - paa tuwaqat'si pipeline, the Secretary shall transfer title to such sections of the pipeline on the Navajo Reservation, except that section that lies on the Navajo Reservation between Moenkopi and the boundary of the 1882 Reservation, to the Navajo Nation, and transfer title to such sections of the pipeline on the Hopi Reservation, and that section that lies on the Navajo Reservation between Moenkopi and the boundary of the 1882 Reservation and the right-of-way for that section of the pipeline, to the Hopi Tribe.
- (3) SUBSTANTIAL COMPLETION. The Secretary shall determine that the iiná bá - paa tuwaqat'si pipeline or a phase of the pipeline is substantially complete after consultation with the Navajo Nation and the Hopi Tribe. Substantial completion of the iiná bá - paa tuwaqat'si pipeline project or a phase of the pipeline project occurs when the infrastructure constructed is capable of storing, diverting, treating, transmitting, and distributing a supply of

Water as set forth in the final project design described in subsection (a)(1).

(4) OPERATION.

(A) The Secretary shall form a Project Operation Committee including the Navajo Nation and the Hopi Tribe. The Project Operation Committee shall develop a project operations agreement to be executed by the Navajo Nation, the Hopi Tribe, and the Secretary prior to substantial completion of any phase of the iiná bá - paa tuwaqat'si pipeline that will provide Water to both the Navajo Nation and the Hopi Tribe. The project operations agreement shall set forth all terms and conditions necessary for long-term operations of the iiná bá - paa tuwaqat'si pipeline, including: (a) distribution of Water; (b) responsibility for maintenance of the iiná bá - paa tuwaqat'si pipeline or section of the pipeline; (c) the allocation and payment of annual OM&R costs of the iiná bá - paa tuwaqat'si pipeline or section of the pipeline based on the proportionate uses and ownership of the pipeline; and (d) a right to sue in United States District Court to enforce the project operations agreement.

(B) The Navajo Nation shall operate that section of the iiná bá - paa tuwaqat'si pipeline that delivers water to the Navajo communities other than Coal Mine Mesa,

and that may deliver Water through the iiná bá - paa tuwaqat'si pipeline to the San Juan Southern Paiute Tribe. The Hopi Tribe shall operate that section of the iiná bá - paa tuwaqat'si pipeline that delivers Water to Moenkopi and the 1882 Reservation and the Navajo community of Coal Mine Mesa.

(b) TRIBAL EASEMENTS AND RIGHTS-OF-WAY.

- (1) In partial consideration for the funding provided under section 13 of the Act, the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe shall each timely consent to the grant of rights-of-way as described in, and in accordance with, subparagraphs 12.5.1, 12.5.2, and 12.5.3 of the settlement agreement.
- (2) With the consent of each affected tribe, the Secretary is authorized to enter into legal devices other than rights-of-way such as construction corridors when operating within the jurisdiction of one of the Navajo Nation, Hopi Tribe, or San Juan Southern Paiute Tribe in furtherance of the planning, design, and construction of the iiná bá - paa tuwaqat'si pipeline.
- (3) The Secretary is authorized to and shall grant the rights-of-way consented to by the Tribes referred to in (b)(1).

**SEC. 9. THE IINA BA - PAA TUWAQAT'SI PIPELINE IMPLEMENTATION FUND.**

- (a) ESTABLISHMENT. The Secretary shall establish a non-trust, interest-bearing account, to be known as the “iiná bá - paa

tuwaqat'si pipeline Implementation Fund Account” (referred to in this section as the “Implementation Fund Account”), to be managed and distributed by the Secretary, for use by the Secretary for carrying out this Act.

- (b) DEPOSITS. The Secretary shall deposit in the Implementation Fund Account established under subsection 9(a), the amounts made available pursuant to paragraphs 13(a)(1).
- (c) USES. The Implementation Fund Account shall be used by the Secretary to carry out section 8 of the Act.
- (d) INTEREST. In addition to the deposits under subsection (b), any investment earnings, including interest credited to amounts unexpended in the Implementation Fund Account are authorized to be appropriated to be used in accordance with the uses described in subsection (c).

**SEC. 10. THE NAVAJO NATION WATER SETTLEMENT TRUST FUND.**

- (a) ESTABLISHMENT. The Secretary shall establish a trust fund for the Navajo Nation, to be known as the “Navajo Nation Water Settlement Trust Fund,” to be managed, invested, and distributed by the Secretary and to remain available until expended, withdrawn, or reverted to the general fund of the Treasury, consisting of the amounts deposited in the Navajo Nation Water Settlement Trust Fund under subsection (c), together with any investment earnings, including interest, earned on those amounts, for the purpose of carrying out this Act.

- (b) ACCOUNTS. The Secretary shall establish in the Navajo Nation Water Settlement Trust Fund the following accounts:
- (1) The Navajo Nation Water Projects Trust Fund Account;
  - (2) The Navajo Nation OM&R Trust Fund Account;
  - (3) The Navajo Nation Agricultural Water Conservation Trust Fund Account;
  - (4) The Navajo Nation Renewable Energy Trust Fund Account;  
and
  - (5) The Navajo Nation Lower Basin Colorado River Water Acquisition Trust Fund Account.
- (c) DEPOSITS. The Secretary shall deposit:
- (1) in the Navajo Nation Water Projects Trust Fund Account established under subsection (b)(1), the amounts made available pursuant to paragraph (A)(i) of section 13(b)(3);
  - (2) in the Navajo Nation OM&R Trust Fund Account established under subsection (b)(2), the amounts made available pursuant to paragraph (A)(ii) of section 13(b)(3);
  - (3) in the Navajo Nation Agricultural Water Conservation Trust Fund Account established under subsection (b)(3), the amounts made available pursuant to paragraph (A)(iii) of section 13(b)(3);
  - (4) in the Navajo Nation Renewable Energy Trust Fund Account established under subsection (b)(4), the amounts made available pursuant to paragraph (A)(iv) of section 13(b)(3); and

- (5) in the Navajo Nation Lower Basin Colorado River Water Acquisition Trust Fund Account established under subsection (b)(5), the amounts made available pursuant to paragraph (A)(v) of section 13(b)(3).
- (d) MANAGEMENT AND INTEREST.
- (1) MANAGEMENT. On receipt and deposit of the funds into the accounts in the Navajo Nation Water Settlement Trust Fund Accounts pursuant to subsection (c), the Secretary shall manage, invest, and distribute all amounts in the Trust Fund in a manner that is consistent with the investment authority of the Secretary under:
    - (A) the first section of the Act of June 24, 1938 (25 U.S.C. 162a);
    - (B) the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. 4001 *et seq.*); and
    - (C) this subsection.
  - (2) INVESTMENT EARNINGS. In addition to the deposits made to the Navajo Nation Water Settlement Trust Fund Accounts under paragraph (c), any investment earnings, including interest, credited to amounts held in the Navajo Nation Water Settlement Trust Fund Accounts are authorized to be appropriated to be used in accordance with paragraph (g).

- (e) WITHDRAWALS.
  - (1) AMERICAN INDIAN TRUST FUND MANAGEMENT REFORM ACT OF 1994.
    - (A) IN GENERAL. The Navajo Nation may withdraw any portion of the amounts in the Navajo Nation Water Settlement Trust Fund Accounts on approval by the Secretary of a Tribal management plan submitted by the Navajo Nation in accordance with the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. 4001 *et seq.*).
    - (B) REQUIREMENTS. In addition to the requirements under the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. 4001 *et seq.*), the Tribal management plan under this paragraph shall require that the Navajo Nation spend all amounts withdrawn from the Navajo Nation Water Settlement Trust Fund Accounts, and any investment earnings accrued through the investments under the Tribal management plan, in accordance with this Act.
    - (C) ENFORCEMENT. The Secretary may carry out such judicial and administrative actions as the Secretary determines to be necessary:
      - (i) to enforce the Tribal management plan; and
      - (ii) to ensure that amounts withdrawn from the Navajo Nation Water Settlement Trust Fund

Accounts by the Navajo Nation under this paragraph are used in accordance with this Act.

(2) EXPENDITURE PLAN.

- (A) IN GENERAL. The Navajo Nation may submit to the Secretary a request to withdraw funds from the Navajo Nation Water Settlement Trust Fund Accounts pursuant to an approved expenditure plan.
- (B) REQUIREMENTS. To be eligible to withdraw funds under an expenditure plan under this paragraph, the Navajo Nation shall submit to the Secretary for approval an expenditure plan for any portion of the Navajo Nation Water Settlement Trust Fund Accounts that the Navajo Nation elects to withdraw pursuant to this subparagraph, subject to the condition that the funds shall be used for the purposes described in this Act.
- (C) INCLUSIONS. An expenditure plan under this paragraph shall include a description of the manner and purpose for which the amounts proposed to be withdrawn from the Navajo Nation Water Settlement Trust Fund Accounts will be used by the Navajo Nation in accordance with subsection (g).
- (D) APPROVAL. On receipt of an expenditure plan under this paragraph, the Secretary shall approve the

expenditure plan if the Secretary determines that the expenditure plan:

- (i) is reasonable; and
- (ii) is consistent with, and will be used for, the purposes of this Act.

(E) ENFORCEMENT. The Secretary may carry out such judicial and administrative actions as the Secretary determines to be necessary to enforce an expenditure plan under this paragraph to ensure that amounts disbursed under this paragraph are used in accordance with this Act.

(f) USES. Amounts from the Navajo Nation Water Settlement Trust Fund Accounts shall be used by the Navajo Nation for the following purposes:

(1) THE NAVAJO NATION WATER PROJECTS TRUST FUND ACCOUNT. Amounts in the Navajo Nation Water Projects Trust Fund Account established under subsection (b)(1) may only be used for the purpose of Environmental compliance, planning, engineering activities, and construction of projects designed to deliver potable water to communities such as Leupp, Dilkon, Ganado, Black Mesa, Sweetwater, Chinle, Lupton/Nahata Dziil Area, Kayenta, and Oljato.

(2) THE NAVAJO NATION OM&R TRUST FUND ACCOUNT. Amounts in the Navajo Nation OM&R Trust

Fund Account established under subsection (b)(2) may only be used to pay OM&R costs of the Navajo Water projects described in subsection (f)(1) and the iiná bá - paa tuwaqat'si pipeline project.

(3) THE NAVAJO NATION AGRICULTURAL WATER CONSERVATION TRUST FUND ACCOUNT. Amounts in the Navajo Nation Agricultural Water Conservation Trust Fund Account established under subsection (b)(3) may only be used to pay the cost of the following:

(A) improvements to reduce water shortages on the Navajo Nation's historically irrigated land including sprinklers, drip or other efficient irrigation systems, land leveling, wells, pipelines, pumps and storage, stream bank stabilization and restoration, pasture seeding and management, fencing, wind breaks or alluvial wells.

(B) up to half of this fund may be used for replacement and development of livestock wells and impoundments on the Navajo Reservation and Navajo Trust Land.

(4) THE NAVAJO NATION RENEWABLE ENERGY TRUST FUND ACCOUNT. Amounts in the Navajo Nation Renewable Energy Trust Fund Account established under subsection (b)(4) may only be used to pay the cost of planning, designing, and constructing renewable energy

facilities to support the cost of operating the Navajo Nation Water projects and the iiná bá - paa tuwaqat'si pipeline.

- (5) THE NAVAJO NATION LOWER BASIN COLORADO RIVER WATER ACQUISITION TRUST FUND ACCOUNT. Amounts in the Navajo Nation Lower Basin Colorado River Water Acquisition Trust Fund Account established under subsection (b)(5) may only be used to purchase land within the State and associated Lower Basin Colorado River Water Rights.
- (g) LIABILITY. The Secretary and the Secretary of the Treasury shall not be liable for the expenditure or investment of any amounts withdrawn from the Navajo Nation Water Settlement Trust Fund Accounts by the Navajo Nation pursuant to paragraph (f).
- (h) TITLE TO INFRASTRUCTURE. Title to, control over, and operation of any project constructed using funds from the Navajo Nation Water Settlement Trust Fund Accounts shall remain in the Navajo Nation.
- (i) PROJECT EFFICIENCIES. If the total cost of the activities described in subsection (g) results in cost savings and is less than the amounts authorized to be obligated under any of subparagraphs (1) through (5) of this subsection required to carry out those activities, the Secretary, at the request of the Navajo Nation, shall deposit those savings in a different Account within the Navajo Nation Water Settlement Trust Fund, to be used in accordance with that subparagraph.

- (j) CONTRIBUTIONS TO THE IINÁ BÁ - PAA TUWAQAT'SI PIPELINE. In its sole discretion the Navajo Nation may utilize funds in any of the Navajo Nation Water Settlement Trust Fund Accounts to supplement funds in the iiná bá - paa tuwaqat'si pipeline Implementation Fund.
- (k) ANNUAL REPORT. The Navajo Nation shall submit to the Secretary an annual expenditure report describing accomplishments and amounts spent from use of withdrawals under a Tribal management plan or an expenditure plan described in this section.
- (l) NO PER CAPITA PAYMENTS. No principal or interest amount in any account established by this section shall be distributed to any member of the Navajo Nation on a per capita basis.
- (m) EFFECT. Nothing in this Act entitles the Navajo Nation to judicial review of a determination of the Secretary regarding whether to approve a Tribal management plan under paragraph (1) or an expenditure plan under paragraph (2), except as provided under subchapter II of chapter 5, and chapter 7, of title 5, United States Code (commonly known as the "Administrative Procedure Act").

**SEC. 11. THE HOPI TRIBE SETTLEMENT TRUST FUND.**

- (a) ESTABLISHMENT. The Secretary shall establish a trust fund for the Hopi Tribe, to be known as the "Hopi Tribe Water Settlement Trust Fund", to be managed, invested, and distributed

by the Secretary and to remain available until expended, withdrawn, or reverted to the general fund of the Treasury, consisting of the amounts deposited in the Hopi Tribe Water Settlement Trust Fund under subsection (c), together with any investment earnings, including interest, earned on those amounts, for the purpose of carrying out this Act.

(b) ACCOUNTS. The Secretary shall establish in the Hopi Tribe Water Settlement Trust Fund the following accounts:

- (1) The Hopi Tribe Groundwater Projects Trust Fund Account;
- (2) The Hopi Tribe OM&R Trust Fund Account;
- (3) The Hopi Tribe Agricultural Water Conservation Trust Fund Account; and
- (4) The Hopi Tribe Lower Basin Colorado River Water Acquisition Trust Fund Account.

(c) DEPOSITS. The Secretary shall deposit:

- (1) in the Hopi Tribe Groundwater Projects Trust Fund Account established under subsection (b)(1), the amounts made available pursuant to paragraph (B)(i) of section 13(b)(3);
- (2) in the Hopi Tribe OM&R Trust Fund Account established under subsection (b)(2), the amounts made available pursuant to paragraph (B)(ii) of section 13(b)(3);
- (3) in the Hopi Tribe Agricultural Water Conservation Trust Fund Account established under subsection (b)(3), the amounts made available pursuant to paragraph (B)(iii) of section 13(b)(3); and

- (4) in the Hopi Tribe Lower Basin Colorado River Water Acquisition Trust Fund Account established under subsection (b)(4), the amounts made available pursuant to paragraph (B)(iv) of section 13(b)(3).
- (d) MANAGEMENT AND INTEREST.
- (1) MANAGEMENT. On receipt and deposit of the funds into the accounts in the Hopi Tribe Water Settlement Trust Fund Accounts pursuant to subsection (c), the Secretary shall manage, invest, and distribute all amounts in the Trust Fund in a manner that is consistent with the investment authority of the Secretary under:
    - (A) the first section of the Act of June 24, 1938 (25 U.S.C. 162a);
    - (B) the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. 4001 *et seq.*); and
    - (C) this subsection.
  - (2) INVESTMENT EARNINGS. In addition to the deposits made to the Hopi Tribe Water Settlement Trust Fund Accounts under paragraph (c), any investment earnings, including interest, credited to amounts held in the Hopi Tribe Water Settlement Trust Fund Accounts are authorized to be appropriated to be used in accordance with paragraph (f).

- (e) WITHDRAWALS.
  - (1) AMERICAN INDIAN TRUST FUND MANAGEMENT REFORM ACT OF 1994.
    - (A) IN GENERAL. The Hopi Tribe may withdraw any portion of the amount in the Hopi Tribe Water Settlement Trust Fund Accounts on approval by the Secretary of a Tribal management plan submitted by the Hopi Tribe in accordance with the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. 4001 *et seq.*).
    - (B) REQUIREMENTS. In addition to the requirements under the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. 4001 *et seq.*), the Tribal management plan under this paragraph shall require that the Hopi Tribe spend all amounts withdrawn from the Hopi Tribe Water Settlement Trust Fund Accounts, and any investment earnings accrued through the investments under the Tribal management plan, in accordance with this Act.
    - (C) ENFORCEMENT. The Secretary may carry out such judicial and administrative actions as the Secretary determines to be necessary:
      - (i) to enforce the Tribal management plan; and
      - (ii) to ensure that amounts withdrawn from the Hopi Tribe Water Settlement Trust Fund Accounts by

the Hopi Tribe under this paragraph are used in accordance with this Act.

- (2) EXPENDITURE PLAN.
  - (A) IN GENERAL. The Hopi Tribe may submit to the Secretary a request to withdraw funds from the Hopi Tribe Water Settlement Trust Fund Accounts pursuant to an approved expenditure plan.
  - (B) REQUIREMENTS. To be eligible to withdraw funds under an expenditure plan under this paragraph, the Hopi Tribe shall submit to the Secretary for approval an expenditure plan for any portion of the Hopi Tribe Water Settlement Trust Fund Accounts that the Hopi Tribe elects to withdraw pursuant to this paragraph, subject to the condition that the funds shall be used for the purposes described in this Act.
  - (C) INCLUSIONS. An expenditure plan under this paragraph shall include a description of the manner and purpose for which the amounts proposed to be withdrawn from the Hopi Tribe Water Settlement Trust Fund Accounts will be used by the Hopi Tribe in accordance with subsection (f).
  - (D) APPROVAL. On receipt of an expenditure plan under this paragraph, the Secretary shall approve the expenditure plan if the Secretary determines that the expenditure plan:

- (i) is reasonable; and
  - (ii) is consistent with, and will be used for, the purposes of this Act.
- (E) ENFORCEMENT. The Secretary may carry out such judicial and administrative actions as the Secretary determines to be necessary to enforce an expenditure plan under this paragraph to ensure that amounts disbursed under this paragraph are used in accordance with this Act.
- (f) USES. Amounts from the Hopi Tribe Water Settlement Trust Fund Accounts shall be used by the Hopi Tribe for the following purposes:
  - (1) THE HOPI TRIBE GROUNDWATER PROJECTS TRUST FUND ACCOUNT. Amounts in the Hopi Tribe Water Projects Trust Fund Account established under subsection (b)(1) may only be used for the purpose of environmental compliance, planning, engineering and design activities, and construction to deliver water to Hopi communities.
  - (2) THE HOPI TRIBE OM&R TRUST FUND ACCOUNT. Amounts in the Hopi Tribe OM&R Trust Fund Account established under subsection (b)(2) may only be used to pay the OM&R costs of the Hopi Water projects described in subsection 11(f)(1) and the iiná bá - paa tuwaqat'si pipeline project.

- (3) THE HOPI TRIBE AGRICULTURAL WATER CONSERVATION TRUST FUND ACCOUNT. Amounts in the Hopi Tribe Agricultural Water Conservation Trust Fund Account established under subsection (b)(3) may only be used to pay the cost of improvements to reduce water shortages on the Hopi Tribe's historically irrigated land and grazing land including sprinklers, drip or other efficient irrigation systems, land leveling, wells, impoundments, pipelines, pumps and storage, stream bank stabilization and restoration, pasture seeding and management, fencing, and wind breaks or alluvial wells, and spring restoration, repair, replacement, and relocation of low technology structures to support Akchin farming, flood-water farming, and other traditional farming practices.
- (4) THE HOPI TRIBE LOWER BASIN COLORADO RIVER WATER ACQUISITION TRUST FUND ACCOUNT. Amounts in the Hopi Tribe Lower Basin Colorado River Water Acquisition Trust Fund Account established under subsection (b)(4) may only be used to purchase land within the State and associated Lower Basin Colorado River Water Rights.
- (g) LIABILITY. The Secretary and the Secretary of the Treasury shall not be liable for the expenditure or investment of any amounts withdrawn from the Hopi Tribe Water Settlement Trust Fund Accounts by the Hopi Tribe pursuant to paragraph (f).

- (h) TITLE TO INFRASTRUCTURE. Title to, control over, and operation of any project constructed using funds from the Hopi Tribe Water Settlement Trust Fund Accounts shall remain in the Hopi Tribe.
- (i) PROJECT EFFICIENCIES. If the total cost of the activities described in subsection (f) results in cost savings and is less than the amounts authorized to be obligated under any of paragraphs (c)1 through 4 of this subsection required to carry out those activities, the Secretary, at the request of the Hopi Tribe, shall deposit those savings in a different Account within the Hopi Tribe Water Settlement Trust Fund, to be used in accordance with that subparagraph.
- (j) CONTRIBUTIONS TO THE IINÁ BÁ - PAA TUWAQAT'SI PIPELINE. In its sole discretion the Hopi Tribe may utilize funds in any of the Hopi Tribe Water Settlement Trust Fund Accounts to supplement funds in the iiná bá - paa tuwaqat'si pipeline Implementation Fund.
- (k) ANNUAL REPORT. The Hopi Tribe shall submit to the Secretary an annual expenditure report describing accomplishments and amounts spent from use of withdrawals under a Tribal management plan or an expenditure plan described in this section.
- (l) NO PER CAPITA PAYMENTS. No principal or interest amount in any account established by this section shall be distributed to any member of the Hopi Tribe on a per capita basis.

- (m) EFFECT. Nothing in this Act entitles the Hopi Tribe to judicial review of a determination of the Secretary regarding whether to approve a Tribal management plan under paragraph (e)(1) or an expenditure plan under paragraph (e)(2), except as provided under subchapter II of chapter 5, and chapter 7, of title 5, United States Code (commonly known as the “Administrative Procedure Act”).

**SEC. 12. THE SAN JUAN SOUTHERN PAIUTE TRIBE WATER SETTLEMENT TRUST FUND.**

- (a) ESTABLISHMENT. The Secretary shall establish a trust fund for the San Juan Southern Paiute Tribe, to be known as the “San Juan Southern Paiute Tribe Water Settlement Trust Fund”, to be managed, invested, and distributed by the Secretary and to remain available until expended, withdrawn, or reverted to the general fund of the Treasury, consisting of the amounts deposited in the Trust Fund Accounts under subsection (c), together with any investment earnings, including interest, earned on those amounts, for the purpose of carrying out this Act.
- (b) ACCOUNTS. The Secretary shall establish in the San Juan Southern Paiute Tribe Water Settlement Trust Fund the following accounts:
  - (1) The San Juan Southern Paiute Tribe Groundwater Project Trust Fund Account;
  - (2) The San Juan Southern Paiute Tribe Agricultural Conservation Trust Fund Account; and

(3) The San Juan Southern Paiute Tribe OM&R Trust Fund Account.

(c) DEPOSITS. The Secretary shall deposit:

(1) in the San Juan Southern Paiute Tribe Groundwater Project Trust Fund Account established under subsection (b)(1), the amounts made available pursuant to paragraph (C)(i) of section 13(b)(3);

(2) in the San Juan Southern Paiute Tribe Agricultural Conservation Trust Fund Account established under subsection (b)(2), the amounts made available pursuant to paragraph (C)(iii) of section 13(b)(3); and

(3) in the San Juan Southern Paiute Tribe OM&R Trust Fund Account established under subsection (b)(3), the amounts made available pursuant to paragraph (C)(ii) of section 13(b)(3).

(d) MANAGEMENT AND INTEREST.

(1) MANAGEMENT. On receipt and deposit of the funds into the accounts in the San Juan Southern Paiute Water Settlement Trust Fund pursuant to subsection (C), the Secretary shall manage, invest, and distribute all amounts in the San Juan Southern Paiute Trust Fund Accounts in a manner that is consistent with the investment authority of the Secretary under:

(A) the first section of the Act of June 24, 1938 (25 U.S.C. 162a);

- (B) the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. 4001 *et seq.*); and
  - (C) this subsection.
- (2) INVESTMENT EARNINGS. In addition to the deposits made to the San Juan Southern Paiute Tribe Water Settlement Trust Fund Accounts under subsection 13(c)(3), any investment earnings, including interest, credited to amounts held in the San Juan Southern Paiute Tribe Water Settlement Trust Fund Accounts are authorized to be appropriated to be used in accordance with paragraph (f).
- (e) WITHDRAWALS.
- (1) AMERICAN INDIAN TRUST FUND MANAGEMENT REFORM ACT OF 1994.
- (A) IN GENERAL. The San Juan Southern Paiute Tribe may withdraw any portion of the amounts in the San Juan Southern Paiute Tribe Water Settlement Trust Fund Accounts on approval by the Secretary of a Tribal management plan submitted by the San Juan Southern Paiute Tribe in accordance with the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. 4001 *et seq.*).
  - (B) REQUIREMENTS. In addition to the requirements under the American Indian Trust Fund Management Reform Act of 1994 (25 U.S.C. 4001 *et seq.*), the Tribal management plan under this paragraph shall require that the San Juan Southern Paiute Tribe spend

all amounts withdrawn from the San Juan Southern Paiute Tribe Water Settlement Trust Fund Accounts, and any investment earnings accrued through the investments under the Tribal management plan, in accordance with this Act.

(C) ENFORCEMENT. The Secretary may carry out such judicial and administrative actions as the Secretary determines to be necessary:

(i) to enforce the Tribal management plan; and

(ii) to ensure that amounts withdrawn from the San Juan Southern Paiute Tribe Water Settlement Trust Fund Accounts by the San Juan Southern Paiute Tribe under this paragraph are used in accordance with this Act.

(2) EXPENDITURE PLAN.

(A) IN GENERAL. The San Juan Southern Paiute Tribe may submit to the Secretary a request to withdraw funds from the San Juan Southern Paiute Tribe Water Settlement Trust Fund Accounts pursuant to an approved expenditure plan.

(B) REQUIREMENTS. To be eligible to withdraw funds under an expenditure plan under this paragraph, the San Juan Southern Paiute Tribe shall submit to the Secretary for approval an expenditure plan for any portion of the San Juan Southern Paiute Tribe Water

Settlement Trust Fund Accounts that the San Juan Southern Paiute Tribe elects to withdraw pursuant to this paragraph, subject to the condition that the funds shall be used for the purposes described in this Act.

- (C) INCLUSIONS. An expenditure plan under this paragraph shall include a description of the manner and purpose for which the amounts proposed to be withdrawn from the San Juan Southern Paiute Tribe Water Settlement Trust Fund Accounts will be used by the San Juan Southern Paiute Tribe in accordance with subsection (f).
- (D) APPROVAL. On receipt of an expenditure plan under this paragraph, the Secretary shall approve the expenditure plan if the Secretary determines that the expenditure plan:
  - (i) is reasonable; and
  - (ii) is consistent with, and will be used for, the purposes of this Act.
- (E) ENFORCEMENT. The Secretary may carry out such judicial and administrative actions as the Secretary determines to be necessary to enforce an expenditure plan under this paragraph to ensure that amounts disbursed under this paragraph are used in accordance with this Act.

- (f) USES. Amounts from the San Juan Southern Paiute Tribe Water Settlement Trust Fund Accounts shall be used by the San Juan Southern Paiute Tribe for the following purposes:
- (1) THE SAN JUAN SOUTHERN PAIUTE TRIBE GROUNDWATER PROJECT TRUST FUND ACCOUNT. Amounts in the San Juan Southern Paiute Tribe Groundwater Project Trust Fund Account established under subsection (b)(1) may only be used to pay the cost of designing and constructing Water projects, including Water treatment facilities, pipelines, storage tanks, pumping stations, pressure reducing valves, electrical transmission facilities, and the other appurtenant items, including real property and easements necessary to deliver groundwater to the areas served.
  - (2) THE SAN JUAN SOUTHERN PAIUTE TRIBE AGRICULTURAL CONSERVATION TRUST FUND ACCOUNT. Amounts in the San Juan Southern Paiute Tribe Agricultural Conservation Trust Fund Account established under subsection (b)(2) may only be used to pay the cost of the following:
    - (A) improvements to reduce water shortages on the San Juan Southern Paiute Tribe's historically irrigated land including sprinklers, drip or other efficient irrigation systems, land leveling, wells, pipelines, pumps and storage, stream bank stabilization and

restoration, pasture seeding and management, fencing, wind breaks or alluvial wells.

(B) up to half of this fund may be used for replacement and development of livestock wells and impoundments on San Juan Southern Paiute Land.

(3) THE SAN JUAN SOUTHERN PAIUTE TRIBE OM&R TRUST FUND ACCOUNT. Amounts in the San Juan Southern Paiute Tribe OM&R Trust Fund Account established under subsection (b)(3) may only be used to pay the OM&R costs of the San Juan Southern Paiute Tribe Water projects described in subsection (f)(1) and for the imputed costs for delivery of Water from the iiná bá - paa tuwaqat'si pipeline.

(g) LIABILITY. The Secretary and the Secretary of the Treasury shall not be liable for the expenditure or investment of any amounts withdrawn from the San Juan Southern Paiute Tribe Water Settlement Trust Fund Accounts by the San Juan Southern Paiute Tribe pursuant to subsection (f).

(h) TITLE TO INFRASTRUCTURE. Title to, control over, and operation of any project constructed using funds from the San Juan Southern Paiute Tribe Water Settlement Trust Fund Accounts shall remain in the San Juan Southern Paiute Tribe.

(i) PROJECT EFFICIENCIES. If the total cost of the activities described in subsection (f) results in cost savings and is less than the amounts authorized to be obligated under any of paragraphs 1

through 3 of this subsection required to carry out those activities, the Secretary, at the request of the San Juan Southern Paiute Tribe, shall deposit those savings in a different Account within the San Juan Southern Paiute Tribe Water Settlement Trust Fund Accounts to be used in other Accounts in accordance with that subparagraph.

- (j) CONTRIBUTIONS TO THE IINÁ BÁ - PAA TUWAQAT'SI PIPELINE. In its sole discretion the San Juan Southern Paiute Tribe may utilize funds in any of the San Juan Southern Paiute Tribe Water Settlement Trust Fund Accounts to supplement funds in the iiná bá - paa tuwaqat'si pipeline Implementation Fund.
- (k) ANNUAL REPORT. The San Juan Southern Paiute Tribe shall submit to the Secretary an annual expenditure report describing accomplishments and amounts spent from use of withdrawals under a Tribal management plan or an expenditure plan described in this section.
- (l) NO PER CAPITA PAYMENTS. No principal or interest amount in any account established by this section shall be distributed to any member of the San Juan Southern Paiute Tribe on a per capita basis.
- (m) EFFECT. Nothing in this Act entitles the San Juan Southern Paiute Tribe to judicial review of a determination of the Secretary regarding whether to approve a Tribal management plan under paragraph (1) or an expenditure plan under paragraph (2), except as provided under subchapter II of chapter 5, and chapter 7, of title 5, United States Code (commonly known as the "Administrative Procedure Act").

**SEC. 13. FUNDING**

(a) THE IINÁ BÁ - PAA TUWAQAT'SI PIPELINE IMPLEMENTATION ACCOUNT.

(1) MANDATORY APPROPRIATION. Out of any funds in the Treasury not otherwise appropriated, the Secretary of the Treasury shall transfer to the Secretary \$1.715 billion for deposit in the iiná bá - paa tuwaqat'si pipeline Implementation Account, to carry out the planning, engineering, design, environmental compliance, and construction of the iiná bá - paa tuwaqat'si pipeline, such funds to remain available until expended, withdrawn, or reverted to the general fund of the Treasury.

(2) AVAILABILITY.

(A) IN GENERAL. Except as provided in subsection (2)(B), amounts appropriated to and deposited in the iiná bá - paa tuwaqat'si pipeline Implementation Account shall not be available for expenditure until such time as the Secretarial findings required by subsection (a) of section 16 are made and published.

(B) EXCEPTION. Of the amount made available under paragraph (1), \$25 million shall be made available before the Enforceability Date for Reclamation to carry out environmental compliance and preliminary design of the iiná bá - paa tuwaqat'si pipeline. Withdrawal of the \$25 million is conditioned on:

- (i) the revision of the settlement agreement and exhibits to conform to the Act; and
  - (ii) execution by all of the settlement parties, including the United States to the conformed settlement agreement and exhibits, including the waivers and releases of claims.
- (3) ADDITIONAL AUTHORIZATION. In addition to the mandatory appropriation made available under paragraph (1), there is authorized to be appropriated to the iiná bá - paa tuwaqat'si pipeline Implementation Account such funds as are necessary to complete the construction of the iiná bá - paa tuwaqat'si pipeline.
- (b) THE NAVAJO NATION WATER SETTLEMENT TRUST FUND, THE HOPI TRIBE WATER SETTLEMENT TRUST FUND AND THE SAN JUAN SOUTHERN PAIUTE SETTLEMENT TRUST FUND.
  - (1) MANDATORY APPROPRIATION. Out of any funds in the Treasury not otherwise appropriated, the Secretary of the Treasury shall transfer to the Secretary \$3.285 billion, for the trust funds established for each of the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe, such funds to remain available until expended, withdrawn, or reverted to the general fund of the Treasury;
  - (2) AVAILABILITY. Amounts appropriated to and deposited in the Navajo Nation Water Settlement Trust Fund, the Hopi Tribe Water Settlement Trust Fund, and the San Juan Southern Paiute Water Settlement Trust Fund shall not be

available for expenditure until such time as the Secretarial findings required by subsection (a) of section 16 are made and published.

(3) ALLOCATION. The Secretary shall distribute the \$3.285 billion funds as follows:

(A) THE NAVAJO NATION WATER SETTLEMENT TRUST FUND. \$2.7467 billion, to remain available until expended, withdrawn, or reverted to the general fund of the Treasury and to be allocated to the Trust Fund Accounts as follows:

- (i) The Navajo Nation Water Projects Trust Fund Account, \$2.3692 billion;
- (ii) The Navajo Nation OM&R Trust Fund Account, \$229.5 million;
- (iii) The Navajo Nation Agricultural Conservation Trust Fund Account, \$80 million;
- (iv) The Navajo Nation Renewable Energy Trust Fund Account, \$40 million; and
- (v) The Navajo Nation Lower Basin Colorado River Water Acquisition Trust Fund Account, \$28 million.

(B) THE HOPI TRIBE WATER SETTLEMENT TRUST FUND. \$508.5 million to remain available until expended, withdrawn, or reverted to the general fund

of the Treasury and to be allocated to the Trust Fund Accounts as follows:

- (i) The Hopi Tribe Groundwater Projects Trust Fund Account, \$390 million;
- (ii) The Hopi Tribe OM&R Trust Fund Account, \$87 million;
- (iii) The Hopi Tribe Agricultural Conservation Trust Fund Account, \$30 million; and
- (iv) The Hopi Tribe Lower Basin Colorado River Water Acquisition Trust Fund Account, \$1.5 million.

(C) THE SAN JUAN SOUTHERN PAIUTE WATER SETTLEMENT TRUST FUND. \$29.8 million to remain available until expended, withdrawn, or reverted to the general fund of the Treasury and to be allocated to the Trust Fund Accounts as follows:

- (i) The San Juan Southern Paiute Groundwater Project Trust Fund Account, \$28 million;
- (ii) The San Juan Southern Paiute OM&R Trust Fund Account, \$1.5 million; and
- (iii) The San Juan Southern Paiute Agricultural Conservation Trust Fund Account, \$0.3 million.

- (c) INVESTMENTS. The Secretary shall invest amounts in the Accounts in accordance with:
- (1) the Act of April 1, 1880 (25 U.S.C. § 161);
  - (2) the first section of the Act of June 24, 1938 (25 U.S.C. § 162a); and
  - (3) obligations of Federal corporations and Federal Government-sponsored entities, the charter documents of which provide that the obligations of the entities are lawful investments for federally managed funds.
- (d) CREDITS TO ACCOUNTS.
- (1) The interest on, and the proceeds from, the sale or redemption of, any obligations held in the Navajo Nation Water Settlement Trust Fund Accounts, the Hopi Tribe Water Settlement Trust Fund Accounts, and the San Juan Southern Paiute Water Settlement Trust Fund Accounts shall be credited to and form a part of the respective accounts.
  - (2) Amounts appropriated to and deposited in the Navajo Nation Water Settlement Trust Fund, the Hopi Tribe Water Settlement Trust Fund, and the San Juan Southern Paiute Tribe Water Settlement Trust Fund, may be used as described in sections 10, 11, and 12 of this Act and paragraph 12 of the settlement agreement.

(e) FLUCTUATION IN COSTS.

(1) IMPLEMENTATION FUND. The amounts authorized to be appropriated under subsection (a) shall be:

(A) increased or decreased, as appropriate, by such amounts as may be justified by reason of ordinary fluctuations in costs occurring after January 1, 2024, as indicated by the Bureau of Reclamation Construction Cost Trends Index applicable to the types of construction involved; and

(B) adjusted to address construction cost changes necessary to account for unforeseen market volatility that may not otherwise be captured by engineering cost indices as determined by the Secretary, including repricing applicable to the types of construction and current industry standards involved.

(2) TRUST FUNDS. The amounts authorized to be appropriated under subsection (b) shall be:

(A) increased or decreased, as appropriate, by such amounts as may be justified by reason of ordinary fluctuations in costs occurring after January 1, 2024, as indicated by the Bureau of Reclamation Construction Cost Index—Composite Trend; and

(B) adjusted to address construction cost changes necessary to account for unforeseen market volatility that may not otherwise be captured by engineering cost indices as determined by the Secretary, including

repricing applicable to the types of construction and current industry standards involved.

(3) REPETITION. The adjustment process under paragraphs (1) and (2) shall be repeated for each subsequent amount appropriated until the amount authorized to be appropriated under subsections (a) and (b), as adjusted, has been appropriated.

(4) PERIOD OF INDEXING.

(A) IMPLEMENTATION FUND. With respect to the Implementation Fund, the period of adjustment under paragraph (1) for any increment of funding shall be annually until the iiná bá - paa tuwaqat'si pipeline project is completed.

(B) TRUST FUNDS. With respect to the Trust Funds, the period of indexing adjustment under paragraph (2) for any increment of funding shall end on the date on which the funds are deposited into the Trust Funds.

#### **SEC. 14. WAIVERS, RELEASES, AND RETENTION OF CLAIMS**

(a) WAIVERS, RELEASES AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE NAVAJO NATION, ON BEHALF OF THE NAVAJO NATION AND THE MEMBERS OF THE NAVAJO NATION (BUT NOT MEMBERS IN THE CAPACITY OF THE MEMBERS AS NAVAJO ALLOTTEES), AND THE UNITED STATES, ACTING AS TRUSTEE FOR THE NAVAJO NATION AND THE MEMBERS OF THE NAVAJO NATION (BUT NOT MEMBERS IN THE CAPACITY OF THE MEMBERS AS NAVAJO ALLOTTEES).

- (1) Except as provided in Subsection 14(a)(3), the Navajo Nation, on behalf of the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), and the United States, acting as trustee for the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), as part of the performance of the respective obligations of the Navajo Nation and the United States under the settlement agreement and this Act, are authorized to execute a waiver and release of all claims against the State (or any agency or political subdivision of the State), the Hopi Tribe, the Hopi Allottees, the San Juan Southern Paiute Tribe, and any other individual, entity, corporation, or municipal corporation under Federal, State, or other law for all:
  - (A) Past, present, and future claims for Water Rights, including rights to Colorado River Water, for Navajo Land, arising from time immemorial and, thereafter, forever;
  - (B) Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Navajo Nation, the predecessors of the Navajo Nation, the Members of the Navajo

- Nation, or predecessors of the Members of the Navajo Nation;
- (C) Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for Navajo Land, arising from time immemorial through the Enforceability Date;
  - (D) Past, present, and future claims for Injury to Water for Navajo Land, arising from time immemorial and, thereafter, forever;
  - (E) Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Navajo Nation, the predecessors of the Navajo Nation, the Members of the Navajo Nation, or predecessors of the Members of the Navajo Nation;
  - (F) Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, for Navajo Land, resulting from the Diversion or Use of Water outside of Navajo Land in a manner not in violation of the settlement agreement or State law; and
  - (G) Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution,

or adoption of the settlement agreement, any judgment or decree approving or incorporating the settlement agreement, or this Act.

- (2) The waiver and release of claims described in subsection (a)(1) shall be in the form set forth in Exhibit 13.1 to the settlement agreement and shall take effect on the Enforceability Date.
- (3) Notwithstanding the waiver and release of claims described in subsection (a)(1) and Exhibit 13.1 to the settlement agreement, the Navajo Nation, acting on behalf of the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), and the United States, acting as trustee for the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), shall retain any right:
  - (A) To assert claims for injuries to, and seek enforcement of, the rights of the Navajo Nation under the settlement agreement, whether such rights are generally stated or specifically described, or this Act, in any Federal or State court of competent jurisdiction;
  - (B) To assert claims for injuries to, and seek enforcement of, the rights of the Navajo Nation under the LCR Decree and the Gila River Adjudication Decree;

- (C) To assert claims for Water Rights, for land owned or acquired by the Navajo Nation in fee, or held in trust by the United States for the benefit of the Navajo Nation, in the LCR Watershed pursuant to subparagraphs 4.11 and 4.12, of the settlement agreement, or in the Gila River Basin pursuant to subparagraphs 4.14 and 4.15 of the settlement agreement;
  - (D) To object to any claims for Water Rights by or for:
    - (i) any Indian Tribe other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or
    - (ii) the United States acting on behalf of any Indian Tribe, other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; and
  - (E) To assert past, present, or future claims for Injury to Water Rights: (i) against any Indian Tribe other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe, other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe.
- (b) WAIVERS, RELEASES AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE UNITED STATES, ACTING AS TRUSTEE FOR THE NAVAJO ALLOTTEES.
- (1) Except as provided in subsection (b)(3), the United States, acting as trustee for the Navajo Allottees, as part of the

performance of the obligations of the United States under the settlement agreement and this Act, is authorized to execute a waiver and release of all claims against the State (or any agency or political subdivision of the State), the Navajo Nation, the Hopi Tribe, the Hopi Allottees, and the San Juan Southern Paiute Tribe, and any other individual, entity, corporation, or municipal corporation under Federal, State, or other law, for all:

- (A) Past, present, and future claims for Water Rights, including rights to Colorado River Water, for Navajo Allotments, arising from time immemorial and, thereafter, forever;
- (B) Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Navajo Allottees or predecessors of the Navajo Allottees;
- (C) Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for Navajo Allotments, arising from time immemorial through the Enforceability Date;
- (D) Past, present, and future claims for Injury to Water for Navajo Allotments, arising from time immemorial and, thereafter, forever;

- (E) Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by Navajo Allottees or predecessors of the Navajo Allottees;
  - (F) Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, for the Navajo Allotments, resulting from the Diversion or Use of Water outside of Navajo Allotments in a manner not in violation of the settlement agreement or State law; and
  - (G) Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of the settlement agreement, any judgment or decree approving or incorporating the settlement agreement, or this Act.
- (2) The waiver and release of claims under subsection (b)(1) shall be in the form set forth in Exhibit 13.2 to the settlement agreement and shall take effect on the Enforceability Date.
  - (3) Notwithstanding the waiver and release of claims described in subsection (b)(1), the United States acting as trustee for the Navajo Allottees, shall retain any right:
    - (A) To assert claims for injuries to, and seek enforcement of, the rights of the Navajo Allottees under the

settlement agreement, whether such rights are generally stated or specifically described, or this Act, in any Federal or State court of competent jurisdiction;

- (B) To assert claims for injuries to, and seek enforcement of, the rights of the Navajo Allottees under the LCR Decree;
  - (C) To object to any claims for Water Rights by or for:
    - (i) any Indian Tribe other than the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or
    - (ii) the United States acting on behalf of any Indian Tribe other than the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; and
  - (D) To assert past, present, or future claims for Injury to Water Rights against: (i) any Indian Tribe other than the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe other than the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe.
- (c) WAIVERS, RELEASES AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE NAVAJO NATION, ON BEHALF OF THE NAVAJO NATION AND THE MEMBERS OF THE NAVAJO NATION (BUT NOT MEMBERS IN THE CAPACITY OF THE MEMBERS AS NAVAJO ALLOTTEES), AGAINST THE UNITED STATES.

- (1) Except as provided in subsection (c)(3), the Navajo Nation, acting on behalf of the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), as part of the performance of the obligations of the Navajo Nation under the settlement agreement and this Act, is authorized to execute a waiver and release of all claims against the United States, including agencies, officials, and employees of the United States, under Federal, State, or other law for all:
  - (A) Past, present, and future claims for Water Rights, including rights to Colorado River Water, for Navajo Land, arising from time immemorial and, thereafter, forever;
  - (B) Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Navajo Nation, the predecessors of the Navajo Nation, the Members of the Navajo Nation, or predecessors of the Members of the Navajo Nation;
  - (C) Claims for Water Rights within the State that the United States, acting as trustee for the Navajo Nation and Navajo Allottees, asserted or could have asserted in any proceeding, except to the extent that such

rights are recognized as part of the Navajo Nation's Water Rights under the Act.;

- (D) Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for Navajo Land, arising from time immemorial through the Enforceability Date;
- (E) Past, present, and future claims for Injury to Water for Navajo Land, arising from time immemorial and, thereafter, forever;
- (F) Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Navajo Nation, the predecessors of the Navajo Nation, the Members of the Navajo Nation, or predecessors of the Members of the Navajo Nation;
- (G) Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date for Navajo Land, resulting from the Diversion or Use of Water outside of Navajo Land in a manner not in violation of the settlement agreement or State law;
- (H) Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution,

or adoption of the settlement agreement, any judgment or decree approving or incorporating the settlement agreement, or this Act;

- (I) Past, present, and future claims arising out of, or relating in any manner to, United States Geological Survey monitoring and reporting activities described in paragraph 7.0 of the settlement agreement;
- (J) Past, present, and future claims arising from time immemorial and, thereafter, forever, relating in any manner to Injury to Water or Injury to Water Rights based on the provisions of paragraphs 8.0 and 9.0 of the settlement agreement;
- (K) Past and Present claims for foregone benefits from non-Navajo Use of Water, on and off Navajo Land (including Water from all sources and for all Uses), within the State arising before the Enforceability Date;
- (L) Past and Present claims for damage, loss, or injury to land or natural resources due to loss of water or Water Rights, including damages, losses, or injuries to hunting, fishing, gathering, or cultural rights due to loss of water or Water Rights, claims relating to interference with, Diversion of, or taking of Water, or claims relating to a failure to protect, acquire, replace, or develop water, Water Rights, or water

infrastructure, within the State, arising before the Enforceability Date;

- (M) Past and Present claims arising before the Enforceability Date from a failure to provide for operation, maintenance, or deferred maintenance for any irrigation system or irrigation project on Navajo Land;
  - (N) Past and Present claims arising before the Enforceability Date from a failure to establish or provide a municipal, rural, or industrial water delivery system on Navajo Land;
  - (O) Past and Present claims for damage, loss, or injury to land or natural resources due to construction, operation, and management of irrigation projects on Navajo Land, including damages, losses, or injuries to fish habitat, wildlife, and wildlife habitat, within the State arising before the Enforceability Date; and
  - (P) Past and Present claims arising before the Enforceability Date from a failure to provide a dam safety improvement to a dam on Navajo Land within the State.
- (2) The waiver and release of claims described in subsection (c)(1) shall be in the form set forth in Exhibit 13.3 to the settlement agreement and shall take effect on the Enforceability Date.

- (3) Notwithstanding the waiver and release of claims described in subsection (c)(1) and Exhibit 13.3 to the settlement agreement, the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Allottees) shall retain any right:
  - (A) To assert claims for injuries to, and seek enforcement of, the rights of the Navajo Nation under the settlement agreement, whether such rights are generally stated or specifically described, or this Act, in any Federal or State court of competent jurisdiction;
  - (B) To assert claims for injuries to, and seek enforcement of, the rights of the Navajo Nation under the LCR Decree and the Gila River Adjudication Decree;
  - (C) To assert claims for Water Rights for land owned or acquired by the Navajo Nation in fee in the LCR Watershed pursuant to subparagraphs 4.11 and 4.12 of the settlement agreement, or in the Verde River Subwatershed pursuant to subparagraphs 4.14 and 4.15 of the settlement agreement;
  - (D) To object to any claims for Water Rights by or for:
    - (i) any Indian Tribe other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe or
    - (ii) the United States acting on behalf of any Indian Tribe other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; and

- (E) To assert past, present, or future claims for Injury to Water Rights against: (i) any Indian Tribe other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe other than the Hopi Tribe, the San Juan Southern Paiute Tribe, and the Zuni Tribe.
- (d) WAIVERS, RELEASES AND RETENTION OF CLAIMS BY THE UNITED STATES IN ALL CAPACITIES (EXCEPT AS TRUSTEE FOR AN INDIAN TRIBE OTHER THAN THE NAVAJO NATION, THE HOPI TRIBE, AND THE SAN JUAN SOUTHERN PAIUTE TRIBE) AGAINST THE NAVAJO NATION AND THE MEMBERS OF THE NAVAJO NATION.
  - (1) Except as provided in subsection (d)(3), the United States, in all capacities (except as trustee for an Indian Tribe other than the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe), as part of the performance of the obligations of the United States under the settlement agreement and this Act, is authorized to execute a waiver and release of all claims against the Navajo Nation, the Members of the Navajo Nation, or any agency, official, or employee of the Navajo Nation, under Federal, State, or any other law for all:
    - (A) Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, resulting from the Diversion or Use of Water on Navajo Land, arising from time immemorial through the Enforceability Date;

- (B) Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, resulting from the Diversion or Use of Water on Navajo Land in a manner that is not in violation of this Agreement or State law; and
  - (C) Past, present, and future claims arising out of, or related in any manner to, the negotiation, execution, or adoption of the settlement agreement, any judgment or decree approving or incorporating the settlement agreement, or this Act.
- (2) The waiver and release of claims under subsection (d)(1) shall be in the form set forth in Exhibit 13.4 to the settlement agreement and shall take effect on the Enforceability Date.
  - (3) Notwithstanding the waiver and release of claims described in subsection (d)(1) and Exhibit 13.4 to the settlement agreement, the United States shall retain any right to assert any claim not expressly waived in accordance with that subsection and that Exhibit, in any Federal or State court of competent jurisdiction.
- (e) **WAIVERS, RELEASES AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE HOPI TRIBE, ON BEHALF OF THE HOPI TRIBE AND THE MEMBERS OF THE HOPI TRIBE (BUT NOT MEMBERS IN THE CAPACITY OF THE MEMBERS AS HOPI ALLOTTEES), AND THE UNITED STATES, ACTING AS TRUSTEE FOR THE HOPI TRIBE AND THE MEMBERS OF THE HOPI TRIBE (BUT NOT MEMBERS IN THE CAPACITY OF THE MEMBERS AS HOPI ALLOTTEES).**

- (1) Except as provided in subsection (e)(3), the Hopi Tribe, on behalf of the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), and the United States, acting as trustee for the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), as part of the performance of the respective obligations of the Hopi Tribe and the United States under the settlement agreement and this Act, are authorized to execute a waiver and release of all claims against the State (or any agency or political subdivision of the State), the Navajo Nation, the Navajo Allottees, the San Juan Southern Paiute Tribe, and any other individual, entity, corporation, or municipal corporation under Federal, State, or other law for all:
  - (A) Past, present, and future claims for Water Rights, including rights to Colorado River Water, for Hopi Land, arising from time immemorial and, thereafter, forever;
  - (B) Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Hopi Tribe, the predecessors of the Hopi Tribe, the Members of the Hopi Tribe, or predecessors of the Members of the Hopi Tribe;

- (C) Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for Hopi Land, arising from time immemorial through the Enforceability Date;
- (D) Past, present, and future claims for Injury to Water for Hopi Land, arising from time immemorial and, thereafter, forever;
- (E) Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Hopi Tribe, the predecessors of the Hopi Tribe, the Members of the Hopi Tribe, or predecessors of the Members of the Hopi Tribe;
- (F) Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, for Hopi Land, resulting from the Diversion or Use of Water outside of Hopi Land in a manner not in violation of the settlement agreement or State law; and
- (G) Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of the settlement agreement, any judgment or decree approving or incorporating the settlement agreement, or this Act.

- (2) The waiver and release of claims described in subsection (e)(1) shall be in the form set forth in Exhibit 13.6 to the settlement agreement and shall take effect on the Enforceability Date.
- (3) Notwithstanding the waiver and release of claims described in subsection (e)(1) and Exhibit 13.6 to the settlement agreement, the Hopi Tribe, acting on behalf of the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), and the United States, acting as trustee for the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), shall retain any right:
  - (A) To assert claims for injuries to, and seek enforcement of, the rights of the Hopi Tribe under the settlement agreement, whether such rights are generally stated or specifically described, or this Act, in any Federal or State court of competent jurisdiction;
  - (B) To assert claims for injuries to, and seek enforcement of, the rights of the Hopi Tribe under the LCR Decree;
  - (C) To assert claims for Water Rights for land owned or acquired by the Hopi Tribe in fee, or held in trust by the United States for the benefit of the Hopi Tribe, in the LCR Watershed pursuant to subparagraphs 5.10 and 5.11 of the settlement agreement;

- (D) To object to any claims for Water Rights by or for:
    - (i) any Indian Tribe other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe;
    - or (ii) the United States acting on behalf of any Indian Tribe, other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; and
  - (E) To assert past, present, or future claims for Injury to Water Rights: against (i) any Indian Tribe other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe, other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe.
- (f) **WAIVERS, RELEASES AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE UNITED STATES, ACTING AS TRUSTEE FOR THE HOPI ALLOTTEES.**
- (1) Except as provided in subsection (f)(3), the United States, acting as trustee for the Hopi Allottees, as part of the performance of the obligations of the United States under the settlement agreement and this Act, is authorized to execute a waiver and release of all claims against the State (or any agency or political subdivision of the State), the Hopi Tribe, the Navajo Nation, the Navajo Allottees, and the San Juan Southern Paiute Tribe, and any other individual, entity, corporation, or municipal corporation under Federal, State, or other law, for all:

- (A) Past, present, and future claims for Water Rights, including rights to Colorado River Water, for Hopi Allotments, arising from time immemorial, and, thereafter, forever;
- (B) Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Hopi Allottees or predecessors of the Hopi Allottees;
- (C) Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for Hopi Allotments, arising from time immemorial through the Enforceability Date;
- (D) Past, present, and future claims for Injury to Water for Hopi Allotments, arising from time immemorial and, thereafter, forever;
- (E) Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by Hopi Allottees or predecessors of the Hopi Allottees;
- (F) Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the

Enforceability Date, for the Hopi Allotments, resulting from the Diversion or Use of Water outside of the Hopi Allotments in a manner not in violation of the settlement agreement or State law; and

(G) Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of the settlement agreement, any judgment or decree approving or incorporating the settlement agreement, or this Act.

(2) The waiver and release of claims under subsection (f)(1) shall be in the form set forth in Exhibit 13.7 of the settlement agreement and shall take effect on the Enforceability Date.

(3) Notwithstanding the waiver and release of claims described in subsection (f)(1) and Exhibit 13.7 of the settlement agreement, the United States acting as trustee for the Hopi Allottees, shall retain any right:

(A) To assert claims for injuries to, and seek enforcement of, the rights of the Hopi Allottees under the settlement agreement, whether such rights are generally stated or specifically described, or this Act, in any Federal or State court of competent jurisdiction;

(B) To assert claims for injuries to, and seek enforcement of, the rights of the Hopi Allottees under the LCR Decree;

- (C) To object to any claims for Water Rights by or for:
    - (i) any Indian Tribe other than the Hopi Tribe, the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe other than the Hopi Tribe, the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; and
  - (D) To assert past, present, or future claims for Injury to Water Rights against: (i) any Indian Tribe other than the Hopi Tribe, the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe other than the Hopi Tribe, the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe.
- (g) WAIVERS, RELEASES AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE HOPI TRIBE, ON BEHALF OF THE HOPI TRIBE AND THE MEMBERS OF THE HOPI TRIBE (BUT NOT MEMBERS IN THE CAPACITY OF THE MEMBERS AS HOPI ALLOTTEES), AGAINST THE UNITED STATES.
- (1) Except as provided in subsection (g)(3), the Hopi Tribe, acting on behalf of the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), as part of the performance of the obligations of the Hopi Tribe under the settlement agreement and this Act, is authorized to execute a waiver and release of all claims against the United States, including

agencies, officials, and employees of the United States, under Federal, State, or other law for all:

- (A) Past, present, and future claims for Water Rights, including rights to Colorado River Water, for Hopi Land, arising from time immemorial and, thereafter, forever;
- (B) Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Hopi Tribe, the predecessors of the Hopi Tribe, the Members of the Hopi Tribe, or predecessors of the Members of the Hopi Tribe;
- (C) Claims for Water Rights within the State that the United States, acting a trustee for the Hopi Tribe and Hopi Allottees, asserted or could have asserted in any proceeding, except to the extent that such rights are recognized as part of the Hopi Tribe's Water Rights under this Act;
- (D) Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for Hopi Land, arising from time immemorial through the Enforceability Date;

- (E) Past, present, and future claims for Injury to Water for Hopi Land, arising from time immemorial and, thereafter, forever;
- (F) Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the Hopi Tribe, the predecessors of the Hopi Tribe, the Members of the Hopi Tribe, or predecessors of the Members of the Hopi Tribe;
- (G) Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date for Hopi Land, resulting from the Diversion or Use of Water outside of Hopi Land in a manner not in violation of the settlement agreement or State law;
- (H) Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of the settlement agreement, any judgment or decree approving or incorporating the settlement agreement, or this Act;
- (I) Past, present, and future claims arising out of, or relating in any manner to, United States Geological Survey monitoring and reporting activities described in paragraph 7.0 of the settlement agreement.

- (J) Past, present, and future claims arising from time immemorial and, thereafter, forever, relating in any manner to Injury to Water or Injury to Water Rights based on the provisions of paragraphs 8.0 and 9.0 of the settlement agreement;
- (K) Past and Present claims for foregone benefits from non-Hopi Use of Water, on and off Hopi Land (including Water from all sources and for all Uses), within the State arising before the Enforceability Date;
- (L) Past and Present claims for damage, loss, or injury to land, or natural resources due to loss of water or Water Rights, including damages, losses, or injuries to hunting, fishing, gathering, or cultural rights due to loss of water or Water Rights, claims relating to interference with, Diversion of, or taking of water, or claims relating to a failure to protect, acquire, replace, or develop water, Water Rights, or water infrastructure, within the State, arising before the Enforceability Date;
- (M) Past and Present claims arising before the Enforceability Date from a failure to provide for operation, maintenance, or deferred maintenance for any irrigation system or irrigation project on Hopi Land;

- (N) Past and Present claims arising before the Enforceability Date from a failure to establish or provide a municipal, rural, or industrial water delivery system on Hopi Land; and
  - (O) Past and Present claims for damage, loss, or injury to land or natural resources due to construction, operation, and management of irrigation project on Hopi Land, including damages, losses, or injuries to fish habitat, wildlife, and wildlife habitat, within the State arising before the Enforceability Date.
- (2) The waiver and release of claims described in subsection (g)(1) shall be in the form set forth in Exhibit 13.8 to the settlement agreement and shall take effect on the Enforceability Date.
- (3) Notwithstanding the waiver and release of claims described in subsection (g)(1) and Exhibit 13.8 to the settlement agreement, the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees) shall retain any right:
- (A) To assert claims for injuries to, and seek enforcement of, the rights of the Hopi Tribe under the settlement agreement, whether such rights are generally stated or specifically described, or this Act, in any Federal or State court of competent jurisdiction;

- (B) To assert claims for injuries to, and seek enforcement of, the rights of the Hopi Tribe under the LCR Decree;
  - (C) To assert claims for Water Rights for land owned or acquired by the Hopi Tribe in fee in the LCR Watershed pursuant to subparagraphs 5.10 and 5.11 of the settlement agreement;
  - (D) To object to any claims for Water Rights by or for:
    - (i) any Indian Tribe other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe;
    - or (ii) the United States acting on behalf of any Indian Tribe other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; and
  - (E) To assert past, present, or future claims for Injury to Water Rights against: (i) any Indian Tribe other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe other than the Navajo Nation, the San Juan Southern Paiute Tribe, and the Zuni Tribe.
- (h) WAIVERS, RELEASES AND RETENTION OF CLAIMS BY THE UNITED STATES IN ALL CAPACITIES (EXCEPT AS TRUSTEE FOR AN INDIAN TRIBE OTHER THAN THE NAVAJO NATION, THE HOPI TRIBE, AND THE SAN JUAN SOUTHERN PAIUTE TRIBE) AGAINST THE HOPI TRIBE AND THE MEMBERS OF THE HOPI TRIBE.
- (1) Except as provided in subsection (h)(3), the United States, in all capacities (except as trustee for an Indian Tribe other

than the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe), as part of the performance of the obligations of the United States under the settlement agreement and this Act, is authorized to execute a waiver and release of all claims against the Hopi Tribe, the Members of the Hopi Tribe, or any agency, official, or employee of the Hopi Tribe, under Federal, State, or any other law for all:

- (A) Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, resulting from the Diversion or Use of Water on Hopi Land arising from time immemorial through the Enforceability Date;
- (B) Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, resulting from the Diversion or Use of Water on Hopi Land in a manner that is not in violation of the settlement agreement or State law; and
- (C) Past, present, and future claims arising out of, or related in any manner to, the negotiation, execution, or adoption of the settlement agreement, any judgment or decree approving or incorporating the settlement agreement, or this Act.

- (2) The waiver and release of claims under subsection (h)(1) shall be in the form set forth in Exhibit 13.9 to the settlement agreement and shall take effect on the Enforceability Date.
  - (3) Notwithstanding the waiver and release of claims described in subsection(h)(1) and Exhibit 13.9 to the settlement agreement, the United States shall retain any right to assert any claim not expressly waived in accordance with that subsection and that Exhibit, in any Federal or State court of competent jurisdiction.
- (i) WAIVERS, RELEASES AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE SAN JUAN SOUTHERN PAIUTE TRIBE, ON BEHALF OF THE SAN JUAN SOUTHERN PAIUTE TRIBE AND THE MEMBERS OF THE SAN JUAN SOUTHERN PAIUTE TRIBE, AND THE UNITED STATES, ACTING AS TRUSTEE FOR THE SAN JUAN SOUTHERN PAIUTE TRIBE AND THE MEMBERS OF THE SAN JUAN SOUTHERN PAIUTE TRIBE.
- (1) Except as provided in subsection (i)(3), the San Juan Southern Paiute Tribe, on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, and the United States, acting as trustee for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, as part of the performance of the respective obligations of the San Juan Southern Paiute Tribe and the United States under the settlement agreement and this Act, is authorized to execute a waiver and release of all claims against the State (or any agency or political subdivision of the State), the Hopi Tribe, the Hopi Allottees,

the Navajo Nation, the Navajo Allottees, and any other individual, entity, corporation, or municipal corporation under Federal, State, or other law for all:

- (A) Past, present, and future claims for Water Rights, including rights to Colorado River Water, for San Juan Southern Paiute Land, arising from time immemorial and, thereafter, forever;
- (B) Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the San Juan Southern Paiute Tribe, the predecessors of the San Juan Southern Paiute Tribe, the Members of the San Juan Southern Paiute Tribe, or predecessors of the Members of the San Juan Southern Paiute Tribe;
- (C) Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for San Juan Southern Paiute Land, arising from time immemorial through the Enforceability Date;
- (D) Past, present, and future claims for Injury to Water for San Juan Southern Paiute Land, arising from time immemorial and, thereafter, forever;
- (E) Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River

Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the San Juan Southern Paiute Tribe, the predecessors of the San Juan Southern Paiute Tribe, the Members of the San Juan Southern Paiute Tribe, or predecessors of the Members of the San Juan Southern Paiute Tribe;

- (F) Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, for San Juan Southern Paiute Land, resulting from the Diversion or Use of Water outside of San Juan Southern Paiute Land in a manner not in violation of the settlement agreement or State law; and
  - (G) Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of the settlement agreement, any judgment or decree approving or incorporating the settlement agreement, or this Act.
- (2) The waiver and release of claims described in subsection (i)(1) shall be in the form set forth in Exhibit 13.11 to the settlement agreement and shall take effect on the Enforceability Date.
  - (3) Notwithstanding the waiver and release of claims described in subsection (i)(1) and Exhibit 13.11 to the settlement agreement, the San Juan Southern Paiute Tribe, acting on

behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, and the United States, acting as trustee for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, shall retain any right:

- (A) To assert claims for injuries to, and seek enforcement of, the rights of the San Juan Southern Paiute Tribe under the settlement agreement, whether such rights are generally stated or specifically described, or this Act, in any Federal or State court of competent jurisdiction;
- (B) To assert claims for injuries to, and seek enforcement of, the rights of the San Juan Southern Paiute Tribe under the LCR Decree;
- (C) To assert claims for Water Rights for land owned or acquired by the San Juan Southern Paiute Tribe in fee or held in trust by the United States for the benefit of the San Juan Southern Paiute Tribe in the LCR Watershed pursuant to subparagraphs 6.4 and 6.5 of the settlement agreement;
- (D) To object to any claims for Water Rights by or for:
  - (i) any Indian Tribe other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe; or
  - (ii) the United States acting on behalf of any Indian Tribe, other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe; and

- (E) To assert past, present, or future claims for Injury to Water Rights against: (i) any Indian Tribe other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe, other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe.
- (j) WAIVERS, RELEASES AND RETENTION OF CLAIMS FOR WATER RIGHTS, INJURY TO WATER RIGHTS, AND INJURY TO WATER BY THE SAN JUAN SOUTHERN PAIUTE TRIBE, ON BEHALF OF THE SAN JUAN SOUTHERN PAIUTE TRIBE AND THE MEMBERS OF THE SAN JUAN SOUTHERN PAIUTE TRIBE, AGAINST THE UNITED STATES.
  - (1) Except as provided in subsection (j)(3), the San Juan Southern Paiute Tribe, acting on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, as part of the performance of the obligations of the San Juan Southern Paiute Tribe under the settlement agreement and this Act, is authorized to execute a waiver and release of all claims against the United States, including agencies, officials, and employees of the United States, under Federal, State, or other law for all:
    - (A) Past, present, and future claims for Water Rights, including rights to Colorado River Water, for San Juan Southern Paiute Land, arising from time immemorial and, thereafter, forever;
    - (B) Past, present, and future claims for Water Rights, including rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that

are based on the aboriginal occupancy of land within the State by the San Juan Southern Paiute Tribe, the predecessors of the San Juan Southern Paiute Tribe, the Members of the San Juan Southern Paiute Tribe, or predecessors of the Members of the San Juan Southern Paiute Tribe;

- (C) Claims for Water Rights within the State that the United States, acting as trustee for the San Juan Southern Paiute Tribe, asserted or could have asserted in any proceeding, except to the extent that such rights are recognized as part of the San Juan Southern Paiute Tribe's Water Rights under this Act;
- (D) Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, for San Juan Southern Paiute Land, arising from time immemorial through the Enforceability Date;
- (E) Past, present, and future claims for Injury to Water for San Juan Southern Paiute Land, arising from time immemorial and, thereafter, forever;
- (F) Past, present, and future claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising from time immemorial and, thereafter, forever, that are based on the aboriginal occupancy of land within the State by the San Juan Southern Paiute Tribe, the predecessors of the San Juan Southern Paiute Tribe, the Members of the San Juan Southern

Paiute Tribe, or predecessors of the Members of the San Juan Southern Paiute Tribe;

- (G) Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date for San Juan Southern Paiute Land, resulting from the Diversion or Use of Water outside of San Juan Southern Paiute Land in a manner not in violation of this Agreement or State law;
- (H) Past, present, and future claims arising out of, or relating in any manner to, the negotiation, execution, or adoption of this Agreement, any judgment or decree approving or incorporating this Agreement, or this Act;
- (I) Past, present, and future claims arising out of, or relating in any manner to, United States Geological Survey monitoring and reporting activities described in paragraph 7.0 of the settlement agreement;
- (J) Past, present, and future claims arising from time immemorial and, thereafter, forever, relating in any manner to Injury to Water or Injury to Water Rights based on the provisions of paragraphs 8.0 and 9.0 of the settlement agreement;
- (K) Past and Present claims for foregone benefits from non-San Juan Southern Paiute Tribe Use of Water, on and off San Juan Southern Paiute Land (including

water from all sources and for all Uses), within the State arising before the Enforceability Date;

- (L) Past and Present claims for damage, loss, or injury to land, or natural resources due to loss of water or Water Rights, including damages, losses, or injuries to hunting, fishing, gathering, or cultural rights due to loss of water or Water Rights, claims relating to interference with, diversion of, or taking of water, or claims relating to a failure to protect, acquire, replace, or develop water, Water Rights, or water infrastructure, within the State, arising before the Enforceability Date;
- (M) Past and Present claims arising before the Enforceability Date from a failure to provide for operation, maintenance, or deferred maintenance for any irrigation system or irrigation project on San Juan Southern Paiute Land;
- (N) Past and Present claims arising before the Enforceability Date from a failure to establish or provide a municipal, rural, or industrial water delivery system on San Juan Southern Paiute Land; and
- (O) Past and Present claims for damage, loss, or injury to land or natural resources due to construction, operation, and management of irrigation project on San Juan Southern Paiute Land, including damages,

losses, or injuries to fish habitat, wildlife, and wildlife habitat, within the State arising before the Enforceability Date.

- (2) The waiver and release of claims described in subsection (j)(1) shall be in the form set forth in Exhibit 13.12 to the settlement agreement and shall take effect on the Enforceability Date.
- (3) Notwithstanding the waiver and release of claims described in subsection (j)(1) and Exhibit 13.12 to the settlement agreement, the San Juan Southern Paiute Tribe, acting on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe shall retain any right:
  - (A) To assert claims for injuries to, and seek enforcement of, the rights of the San Juan Southern Paiute Tribe under the settlement agreement, whether such rights are generally stated or specifically described, or this Act, in any Federal or State court of competent jurisdiction;
  - (B) To assert claims for injuries to, and seek enforcement of, the rights of the San Juan Southern Paiute Tribe under the LCR Decree;
  - (C) To assert claims for Water Rights for land owned or acquired by the San Juan Southern Paiute Tribe in fee

in the LCR Watershed pursuant to subparagraphs 6.4 and 6.5 of the settlement agreement;

- (D) To object to any claims for Water Rights by or for:
    - (i) any Indian Tribe other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe, other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe; and
  - (E) To assert past, present, or future claims for Injury to Water Rights against: (i) any Indian Tribe other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe; or (ii) the United States acting on behalf of any Indian Tribe, other than the Hopi Tribe, the Navajo Nation, and the Zuni Tribe;
- (k) WAIVERS, RELEASES AND RETENTION OF CLAIMS BY THE UNITED STATES IN ALL CAPACITIES (EXCEPT AS TRUSTEE FOR AN INDIAN TRIBE OTHER THAN THE NAVAJO NATION, THE HOPI TRIBE, AND THE SAN JUAN SOUTHERN PAIUTE TRIBE) AGAINST THE SAN JUAN SOUTHERN PAIUTE TRIBE AND THE MEMBERS OF THE SAN JUAN SOUTHERN PAIUTE TRIBE.
- (1) Except as provided in subsection (k)(3), the United States, in all capacities (except as trustee for an Indian Tribe other than the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe), as part of the performance of the obligations of the United States under the settlement agreement and this Act, is authorized to execute a waiver and release of all claims against the San Juan Southern

Paiute Tribe, the Members of the San Juan Southern Paiute Tribe, or any agency, official, or employee of the San Juan Southern Paiute Tribe, under Federal, State, or any other law for all:

- (A) Past and present claims for Injury to Water Rights, including injury to rights to Colorado River Water, resulting from the Diversion or Use of Water on San Juan Southern Paiute Land arising from time immemorial through the Enforceability Date;
- (B) Claims for Injury to Water Rights, including injury to rights to Colorado River Water, arising after the Enforceability Date, resulting from the Diversion or Use of Water on San Juan Southern Paiute Land in a manner that is not in violation of the settlement agreement or State law; and
- (C) Past, present, and future claims arising out of, or related in any manner to, the negotiation, execution, or adoption of the settlement agreement, any judgment or decree approving or incorporating the settlement agreement, or this Act.
- (D) The waiver and release of claims under subsection (k)(1) shall be in the form set forth in Exhibit 13.15 to the settlement agreement and shall take effect on the Enforceability Date.

- (2) Notwithstanding the waiver and release of claims described in subsection (k)(1) and Exhibit 13.13 to the settlement agreement, the United States shall retain any right to assert any claim not expressly waived in accordance with that subsection and that Exhibit, in any Federal or State court of competent jurisdiction.

**SEC. 15. SATISFACTION OF WATER RIGHTS AND OTHER BENEFITS.**

(a) THE NAVAJO NATION AND THE MEMBERS OF THE NAVAJO NATION.

- (1) The benefits provided under the settlement agreement shall be in complete replacement of, complete substitution for, and full satisfaction of any claim of the Navajo Nation and the Members of the Navajo Nation against the Parties, including the United States, that is waived and released by the Navajo Nation acting on behalf of the Navajo Nation and the Members of the Navajo Nation under Exhibits 13.1 and 13.3 to the settlement agreement.
- (2) Any entitlement to water of the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees) or the United States acting as trustee for the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), for Navajo Land shall be satisfied out of the water resources and other benefits granted, confirmed, quantified, or recognized by the settlement agreement and this Act, to or for the Navajo

Nation, the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees), and the United States, acting as trustee for the Navajo Nation and the Members of the Navajo Nation (but not Members in the capacity of the Members as Navajo Allottees).

(b) NAVAJO ALLOTTEES AND THE UNITED STATES, ACTING AS TRUSTEE FOR THE NAVAJO ALLOTTEES.

(1) The benefits realized by the Navajo Allottees under the settlement agreement and this Act shall be in complete replacement of, complete substitution for, and full satisfaction of:

(A) all claims waived and released by the United States (acting as trustee for the Navajo Allottees) under Exhibit 13.2 to the settlement agreement.

(B) Any claims of the Navajo Allottees against the United States similar to the claims described in Exhibit 13.2 to the settlement agreement that the Navajo Allottees asserted or could have asserted.

(2) Any entitlement to water of the Navajo Allottees or the United States acting as trustee for the Navajo Allottees, for Navajo Allotments shall be satisfied out of the water resources and other benefits granted, confirmed, or recognized by the settlement agreement and this Act, to or for the Navajo Allottees and the United States, acting as trustee for the Navajo Allottees.

- (3) Notwithstanding subsection 15(a) and 15(b), nothing in this Agreement or the Act recognizes or establishes any right of a Member of the Navajo Nation to Water on Navajo Land.
- (c) THE HOPI TRIBE AND THE MEMBERS OF THE HOPI TRIBE.
- (1) The benefits provided under the settlement agreement shall be in complete replacement of, complete substitution for, and full satisfaction of any claim of the Hopi Tribe and the Members of the Hopi Tribe against the Parties, including the United States, that is waived and released by the Hopi Tribe acting on behalf of the Hopi Tribe and the Members of the Hopi Tribe under Exhibits 13.6 and 13.8 to the settlement agreement.
  - (2) Any entitlement to Water of the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees) or the United States acting as trustee for the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), for Hopi Land shall be satisfied out of the Water resources and other benefits granted, confirmed, quantified, or recognized by the settlement agreement and this Act, to or for the Hopi Tribe, the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees), and the United States, acting as trustee for the Hopi Tribe and the Members of the Hopi Tribe (but not Members in the capacity of the Members as Hopi Allottees).

- (d) HOPI ALLOTTEES AND THE UNITED STATES, ACTING AS TRUSTEE FOR THE HOPI ALLOTTEES.
- (1) The benefits realized by the Hopi Allottees under the settlement agreement shall be in complete replacement of, complete substitution for, and full satisfaction of:
    - (A) all claims waived and released by the United States (acting as trustee for the Hopi Allottees) under Exhibit 13.7 to the settlement agreement; and.
    - (B) any claims of the Hopi Allottees against the United States similar to the claims described in Exhibit 13.7 to the settlement agreement that the Hopi Allottees asserted or could have asserted.
  - (2) Any entitlement to water of the Hopi Allottees or the United States acting trustee for the Hopi Allottees, for Hopi Allotments shall be satisfied out of the water resources and other benefits granted, confirmed, or recognized by the settlement agreement and this Act, to or for the Hopi Allottees and the United States, acting as trustee for the Hopi Allottees.
  - (3) Notwithstanding subsections 15(c) and 15(d), nothing in the settlement agreement or this Act, recognizes or establishes any right of a Member of the Hopi Tribe (but not a Member in the capacity of the Member as a Hopi Allottee) to water on Hopi Land.

- (e) SAN JUAN SOUTHERN PAIUTE TRIBE AND THE MEMBERS OF THE SAN JUAN SOUTHERN PAIUTE TRIBE.
- (1) The benefits provided under the settlement agreement shall be in complete replacement of, complete substitution for, and full satisfaction of any claim of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe against the Parties, including the United States, that is waived and released by the San Juan Southern Paiute Tribe acting on behalf of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe under Exhibits 13.11 and 13.12 to the settlement agreement.
  - (2) Any entitlement to water of the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe or the United States, acting as trustee for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe, for San Juan Southern Paiute Land shall be satisfied out of the water resources and other benefits granted, confirmed, quantified, or recognized by the settlement agreement and this Act, to or for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe and the United States, acting as trustee for the San Juan Southern Paiute Tribe and the Members of the San Juan Southern Paiute Tribe.
  - (3) Notwithstanding subsections 15(e) nothing in the settlement agreement or this Act recognizes or establishes any right of a Member of the San Juan Southern Paiute Tribe to water on the San Juan Southern Paiute Southern Area.

**SEC. 16. ENFORCEABILITY DATE.**

(a) **CONDITIONS TO THE ENFORCEABILITY DATE.**

The settlement agreement, including the waivers and releases of claims described in paragraph 13 of the settlement agreement and in section 14 of this Act, shall take effect and be fully enforceable on the date on which the Secretary publishes in the Federal Register a statement of findings that:

- (1) the settlement agreement has been revised, through an amendment and restatement to:
  - (A) eliminate any conflict between the settlement agreement and the Act; and
  - (B) include the executed Water Delivery Contracts required by subparagraphs 10.1.1, 10.1.2, 10.1.3, 11.1.1, and 11.1.2 as Exhibits to the settlement agreement.
- (2) The settlement agreement as revised through an amendment and restatement has been signed by all Parties and any exhibit requiring execution by any Party has been executed by the required Party.
- (3) The waivers and releases of claims described in paragraph 13 of the settlement agreement and section 14 of this Act have been executed by the United States, Navajo Nation, Hopi Tribe, San Juan Southern Paiute Tribe, the State, and the other Parties.

- (4) Five billion dollars (\$5.0 billion) has been authorized, appropriated, and deposited in the designated accounts.
- (5) The LCR Decree has been approved by the LCR Adjudication Court substantially in the form of the judgment and decree attached as Exhibit 3.1.82 to the settlement agreement, as amended to ensure consistency with this Act.
- (6) The Gila River Adjudication Decree has been approved by the Gila River Adjudication Court substantially in the form of the judgment and decree attached as Exhibit 3.1.47 to the settlement agreement, as amended to ensure consistency with this Act.
- (7) The San Juan Southern Paiute Tribe and NTUA have executed a Water services agreement to deliver municipal Water to the San Juan Southern Paiute Tribe and its members.
- (8) Each of the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe have executed the tribal resolution referenced in subsection 18(a)(2), 18(b)(2), and 18(c)(2) of this Act consenting to the limited waiver of sovereign immunity from suit in the circumstances described in Section 18.

(b) FAILURE TO SATISFY CONDITIONS.

- (1) IN GENERAL. Except as provided in subsection (2), if the Secretary fails to publish in the Federal Register a statement

of findings under subsection (a) by June 30, 2035, or such alternative later date as may be agreed to by the Navajo Nation, the Hopi Tribe, the San Juan Southern Paiute Tribe, the Secretary, and the State:

- (A) this Act is repealed with the exception described in paragraph (2) below;
  - (B) Any action taken by the Secretary and any contract or agreement entered into pursuant to this Act shall be void;
  - (C) The United States shall be entitled to Offset any Federal amounts made available under section 13(a)(2)(B) that were used under that section against any claims asserted by the Tribes against the United States; and
  - (D) Any amounts appropriated under section 13, together with any investment earnings on those amounts, less any amounts expended under sections 9, 10, 11, and 12, shall revert immediately to the general fund of the Treasury.
- (2) CONTINUED EXISTENCE OF THE SAN JUAN SOUTHERN PAIUTE RESERVATION. Section 19 becomes effective upon the enactment date. Notwithstanding subsection (1), if the Secretary fails to publish in the Federal Register a statement of findings under subsection (1) by June 30, 2035, or such alternative later

date as may be agreed to by the Tribes, the Secretary and the State, section 19 shall remain in effect.

**SEC. 17. COLORADO RIVER ACCOUNTING.**

- (a) ACCOUNTING FOR THE TYPE OF WATER DELIVERED.
- (1) All deliveries of Navajo Nation Cibola Water and Navajo Nation Fourth Priority Water effected by the diversion of Water from the San Juan River or from the Colorado River above Lee Ferry shall be accounted for as deliveries of Arizona Lower Basin Colorado River Water.
  - (2) All deliveries of Hopi Tribe Cibola Water effected by the diversion of Water from the Colorado River above Lee Ferry shall be accounted for as deliveries of Arizona Lower Basin Colorado River Water.
  - (3) All deliveries of Navajo Nation Upper Basin Colorado River Water effected by diversion of water from the Upper Basin in Arizona, New Mexico, or Utah shall be accounted for as deliveries of Arizona Upper Basin Colorado River Water.
  - (4) All deliveries of Hopi Tribe Upper Basin Colorado River Water effected by diversion of water from the Upper Basin in Arizona, shall be accounted for as deliveries of Arizona Upper Basin Colorado River Water.
  - (5) All deliveries of Upper Basin Colorado River Water leased by either the Navajo Nation or the Hopi Tribe whether effected by a diversion of water from the Upper Basin or the

Lower Basin shall be accounted for as deliveries of Arizona Upper Basin Colorado River Water.

- (6) All deliveries of Colorado River Water in the Lower Basin leased by either the Navajo Nation or the Hopi Tribe whether effected by a diversion of water from the Upper Basin or the Lower Basin shall be accounted for as deliveries of Arizona Lower Basin Colorado River Water.

- (b) SPECIAL ACCOUNTING RULES FOR LOWER BASIN COLORADO RIVER WATER AS LOWER BASIN USE IN ARIZONA, REGARDLESS OF POINT OF DIVERSION OR PLACE OF USE.

Notwithstanding section 10603(c)(2)(A) of the Northwestern New Mexico Rural Water Projects Act, title X.B of the Omnibus Public Land Management Act of 2009, Public Law 111-11, all Navajo Nation Cibola Water, Navajo Nation Fourth Priority Water, and Hopi Tribe Cibola Water delivered to and consumptively used by the Navajo Nation, the Hopi Tribe, or their lessees pursuant to the settlement agreement shall be:

- (1) accounted for as if such use had occurred in the Lower Basin, regardless of the point of diversion or place of use;
- (2) credited as Water reaching Lee Ferry pursuant to articles III(c) and III(d) of the Colorado River Compact;
- (3) charged against the consumptive use apportionment made to the Lower Basin by article III(a) of the Colorado River Compact; and

- (4) accounted for as part of and charged against the 2.8 million acre-feet of Colorado River Water apportioned to Arizona in article II(B)(1) of the decree.
- (c) LIMITATION. Notwithstanding subsections (a) and (b), no water diverted by the Navajo-Gallup Water Supply Project shall be accounted for as provided in subsections (a) and (b) until such time as the Secretary has developed and, as necessary and appropriate, modified, in consultation with the State, the Upper Basin Colorado River Commission and the Governors' representatives on Colorado River Operations from each state signatory to the Colorado River Compact, all operational and decisional criteria, policies, contracts, guidelines, or other documents that control the operations of the Colorado River system reservoirs and diversion works, so as to adjust, account for, and offset the diversion of Water apportioned to the State, pursuant to the Boulder Canyon Project Act of 1928 (43 U.S.C. § 617 *et seq.*), from a point of diversion on the San Juan River in New Mexico; provided that all such modifications shall be consistent with the provisions of section 10603(c) of the Northwestern New Mexico Rural Water Projects Act, as modified by this Act, and the modifications made pursuant to this clause shall be applicable only for the duration of any such diversions pursuant to section 10603(c)(2)(B) of the Northwestern New Mexico Rural Water Projects Act and this Act.

**SEC. 18. LIMITED WAIVER OF SOVEREIGN IMMUNITY.**

(a) LIMITED WAIVER BY THE NAVAJO NATION AND THE UNITED STATES ACTING AS TRUSTEE FOR THE NAVAJO NATION AND NAVAJO ALLOTTEES.

(1) The Navajo Nation, and the United States acting as trustee for the Navajo Nation and Navajo Allottees, may be joined in any action brought in any circumstance described in subsection 18(a)(3), and any claim by the Navajo Nation and the United States to sovereign immunity from any such action is waived.

(2) By Resolution -----dated ----, the Navajo Nation Council has affirmatively consented to the limited waiver of sovereign immunity from suit in any circumstance described in Subsection 18(a)(3), notwithstanding any provision of the Navajo Nation Code or any other Navajo Nation law.

(3) A circumstance referred to in Subsection (a)(1) and (a)(2) is described as any of the following:

(A) Any party to the settlement agreement:

(i) brings an action in any court of competent jurisdiction relating only and directly to the interpretation or enforcement of

(I) this Act; or

(II) the settlement agreement; and

- (ii) names the Navajo Nation, or the United States acting as trustee for the Navajo Nation or Navajo Allottees, as a party in that action; and
  - (iii) shall not include any request for award against the Navajo Nation, or the United States acting as trustee for the Navajo Nation or Navajo Allottees, for money damages, court costs, or attorney fees.
- (B) Any landowner or water user in the LCR Watershed or the Gila River Watershed:
  - (i) brings an action in any court of competent jurisdiction relating only and directly to the interpretation or enforcement of:
    - (I) Paragraph 13 of the settlement agreement;
    - (II) The LCR Decree or the Gila River Adjudication Decree;
    - (III) section 14 of this Act; and/or
  - (ii) names the Navajo Nation, or the United States acting as trustee for the Navajo Nation or Navajo Allottees, as a party in that action; and
  - (iii) shall not include any request for award against the Navajo Nation, or the United States acting as trustee for the Navajo Nation or Navajo

Allottees, for money damages, court costs or attorney fees.

(b) LIMITED WAIVER BY THE HOPI TRIBE AND THE UNITED STATES ACTING AS TRUSTEE FOR THE HOPI TRIBE AND HOPI ALLOTEES.

- (1) The Hopi Tribe, and the United States acting as trustee for the Hopi Tribe and Hopi Allottees, may be joined in any action brought in any circumstance described in subsection 18(b)(3), and any claim by the Hopi Tribe and the United States to sovereign immunity from any such action is waived.
- (2) By Resolution -----dated ----, the Hopi Tribal Council has affirmatively consented to the limited waiver of sovereign immunity from suit in any circumstance described in subsection 18(b)(3) notwithstanding any provision of the Hopi Tribal Code or any other Hopi Tribe law.
- (3) A circumstance referred to in subsections (b)(1) and (b)(2) is described as any of the following:
  - (A) Any party to the settlement agreement
    - (i) brings an action in any court of competent jurisdiction relating only and directly to the interpretation or enforcement of:
      - (I) this Act; or
      - (II) the settlement agreement; and

- (ii) names the Hopi Tribe or the United States, acting as trustee for the Hopi Tribe or Hopi Allottees, as a party in that action; and
  - (iii) shall not include any request for award against the Hopi Tribe, or the United States acting as trustee for the Hopi Tribe or Hopi Allottees, for money damages, court costs, or attorney fees.
- (B) Any landowner or water user in the LCR Watershed:
  - (i) brings an action in any court of competent jurisdiction relating only and directly to the interpretation or enforcement of:
    - (I) Paragraph 13 of the settlement agreement;
    - (II) The LCR Decree; or
    - (III) Section 14 of this Act; and
  - (ii) names the Hopi Tribe, or the United States acting as trustee for the Hopi Tribe or Hopi Allottees, as a party in that action; and
  - (iii) shall not include any request for award against the Hopi Tribe, or the United States acting as trustee for the Hopi Tribe or Hopi Allottees, for money damages, court costs, or attorney fees.

(c) LIMITED WAIVER BY THE SAN JUAN SOUTHERN PAIUTE TRIBE AND THE UNITED STATES ACTING AS TRUSTEE FOR THE SAN JUAN SOUTHERN PAIUTE TRIBE.

(1) The San Juan Southern Paiute Tribe and the United States acting as trustee for the San Juan Southern Paiute Tribe may be joined in any action brought in any circumstance described in subsection 18(c)(3), and any claim by the San Juan Southern Paiute Tribe and the United States to sovereign immunity from any such action is waived.

(2) By Resolution -----dated ----, the San Juan Southern Paiute Tribal Council has affirmatively consented to the limited waiver of sovereign immunity from suit in any circumstance described in subsection 18(c)(3), notwithstanding any provision of the San Juan Southern Paiute Tribal Code or any other San Juan Southern Paiute Tribe law.

(3) A circumstance referred to in Subsections 18(c)(1) and 18(c)(2) is described as any of the following:

(A) Any party to the settlement agreement:

(i) brings an action in any court of competent jurisdiction relating only and directly to the interpretation or enforcement of:

(I) this Act; or

(II) the settlement agreement; and

(ii) names the San Juan Southern Paiute Tribe or the United States acting as trustee for the San

Juan Southern Paiute Tribe as a party in that action; and

- (iii) shall not include any request for award against the San Juan Southern Paiute Tribe, or the United States acting as trustee for the San Juan Southern Paiute Tribe, for money damages, court costs, or attorney fees.

(B) Any landowner or water user in the LCR Watershed:

- (i) brings an action in any court of competent jurisdiction relating only and directly to the interpretation or enforcement of:

- (I) Paragraph 13 of the settlement agreement;

- (II) The LCR Decree; or

- (III) section 14 of this Act; and

- (ii) names the San Juan Southern Paiute Tribe or the United States acting as trustee for the San Juan Southern Paiute Tribe as a party in that action; and

- (iii) shall not include any request for award against the San Juan Southern Paiute Tribe, or the United States acting as trustee for the San Juan Southern Paiute Tribe, for money damages, court costs, or attorney fees.

**SEC. 19. RATIFICATION OF THE TREATY AND CREATION OF THE SAN JUAN SOUTHERN PAIUTE RESERVATION.**

(a) RATIFICATION AND APPROVAL OF THE TREATY.

The Treaty and the Treaty Addendum are hereby approved, ratified, and confirmed by the Congress of the United States.

(b) APPROVAL OF THE SECRETARY.

(1) The Secretary is authorized and directed:

(A) to approve and execute the Treaty and the Treaty Addendum as set forth therein, except that the specific findings stated under the heading “APPROVAL,” shall not be binding on the Secretary; and

(B) to take all steps necessary to implement the Treaty and this Act.

(2) The Secretary is delegated the authority, without further Act of Congress, to approve and execute amendments to the Treaty agreed to by the Navajo Nation and the San Juan Southern Paiute Tribe.

(c) LANDS PROCLAIMED A RESERVATION FOR THE SAN JUAN SOUTHERN PAIUTE TRIBE.

(1) IN GENERAL. All right, title and interest, including Water Rights, to the approximately 5,400 acres of land within the Navajo Indian Reservation that are described in the Treaty as the San Juan Paiute Northern Area and the San Juan Paiute Southern Paiute Area, are hereby proclaimed as the San Juan Southern Paiute Reservation and such lands shall

be held by the United States in trust as a reservation for the exclusive benefit of the San Juan Southern Paiute Tribe, subject to the rights of access under subsection (d) of this Act.

- (2) NO APPRAISAL OR VALUATION. Notwithstanding any other law, no appraisal or other valuation shall be required to carry out the provisions of this subsection.
- (d) RIGHTS OF ACCESS AND EASEMENTS. The Navajo Reservation and the San Juan Southern Paiute Reservation shall be subject to the rights of access and easements as identified in the Treaty.
- (e) SURVEYING AND FENCING OF LAND.
  - (1) REQUIREMENT. The Secretary is directed to:
    - (A) complete a survey and legal description of the boundary lines to establish the boundaries of the San Juan Southern Paiute Reservation, as soon as practicable after the date of enactment of this Act;
    - (B) officially file the survey plat in the appropriate office of the Department of the Interior;
    - (C) mark and fence the lands as described in article V of the Treaty, where feasible; and
    - (D) study the feasibility of an access road to the San Juan Paiute Southern Area from U.S. Route 89, as described in article XI of the Treaty.

(2) LEGAL DESCRIPTION.

(A) IN GENERAL. The legal descriptions published in accordance with subsection (e)(2) shall be considered the official legal description of the San Juan Southern Paiute Reservation and shall have the same force and effect as if included in this Act.

(B) PUBLICATION. Upon completion of the surveys under subsection (e)(1), the Secretary shall publish in the Federal Register a legal description of the lands comprising the San Juan Southern Paiute Reservation.

(C) CORRECTIONS. The Secretary may make minor correction to correct technical and clerical errors in the legal descriptions.

(f) REPEAL OF PAIUTE ALLOTMENT PROCEDURES. Section 9 of Public Law 93-531 (88 Stat. 1716, formerly codified at 25 U.S.C. 640d-8) is repealed.

(g) PUBLICATION; JURISDICTION.

(1) PUBLICATION. In accordance with article VI of the Treaty, the Secretary shall publish in the Federal Register separate notices of completion or boundary marking of:

(A) the San Juan Paiute Northern Area; and

(B) the San Juan Paiute Southern Area.

- (2) JURISDICTION. Upon publication in the Federal Register under either subsection (g)(1)(A) or (g)(1)(B):
  - (A) the San Juan Southern Paiute Tribe shall have full jurisdiction over all matters within that area of the San Juan Southern Paiute Reservation to the fullest extent permitted by Federal law; and
  - (B) the Navajo Nation shall no longer have jurisdiction over matters occurring within that area of the San Juan Southern Paiute Reservation except as agreed to by the Navajo Nation and the San Juan Southern Paiute Tribe.

**SEC. 20. IN GENERAL.**

- (a) NO QUANTIFICATION OR EFFECT ON RIGHTS OF OTHER TRIBES OR THE UNITED STATES ON THEIR BEHALF.

Except as provided in paragraph 8.3 of the settlement agreement nothing in this Act:

- (1) quantifies or otherwise affects the Water Rights, or claims or entitlements to water or to Upper Basin Colorado River Water or Lower Basin Colorado River Water, of any Indian tribe, band, or community, other than the Navajo Nation, the Hopi Tribe, or the San Juan Southern Paiute Tribe; or
- (2) affects the ability of the United States to take action on behalf of any Indian tribe, nation, band, community, or allottee, other than the Navajo Nation, the Hopi Tribe and the San Juan Southern Paiute Tribe, their members, Navajo allottees, Hopi allottees, and public domain allottees.

(b) NO QUANTIFICATION OF WATER RIGHTS OF PUBLIC DOMAIN ALLOTTEES.

Nothing in this Act quantifies or adjudicates any Water Right or any claim or entitlement to Water of a public domain allottee, or precludes the United States, acting as trustee for public domain allottees, from making claims for Water Rights in Arizona that are consistent with the claims described in Exhibit 3.1.132B to the settlement agreement. Except as provided in Subparagraphs 8.2.3, 8.4.7, and 15.2.3.4 of the settlement agreement, nothing in this Act affects the ability of the United States to take action on behalf of public domain allottees.

(c) ANTIDEFICIENCY. Notwithstanding any authorization of appropriations to carry out this Act, the United States shall not be liable for any failure of the United States to carry out any obligation or activity authorized by this Act, including all agreements or exhibits ratified or confirmed by this Act if adequate appropriations are not provided expressly by Congress to carry out the purposes of this Act.

(d) NO MODIFICATION OR PREEMPTION OF OTHER LAWS. Unless expressly provided in this Act, nothing in this Act modifies, conflicts with, preempts, or otherwise affects:

- (1) the Boulder Canyon Project Act of 1928 (43 U.S.C. § 617 *et seq.*);
- (2) the Boulder Canyon Project Adjustment Act (54 Stat. 774, chapter 643);

- (3) the Act of April 11, 1956 (commonly known as the “Colorado River Storage Project Act”) (43 U.S.C. § 620, *et seq.*);
  - (4) the Act of September 30, 1968 (commonly known as the “Colorado River Basin Project Act”) (82 Stat. 885);
  - (5) the Treaty between the United States of America and Mexico respecting Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, signed at Washington February 3, 1944 (59 Stat. 1219);
  - (6) the Colorado River Compact of 1922;
  - (7) the Upper Colorado River Basin Compact of 1948;
  - (8) the Omnibus Public Land Management Act of 2009, Public Law 111-11; or
  - (9) case law concerning Water Rights in the Colorado River system other than any case to enforce the settlement agreement or this Act.
- (e) NO PRECEDENT. Nothing in this Act shall be construed as establishing a precedent for any type of transfer of Colorado River system water between the Upper Basin and the Lower Basin.
- (f) UNIQUE SITUATION. Diversions through the iiná bá - paa tuwaqat’si pipeline and the Navajo-Gallup Water Supply Project facilities consistent with this Act address critical tribal and non-Indian Water supply needs under unique circumstances, which include, among other things:

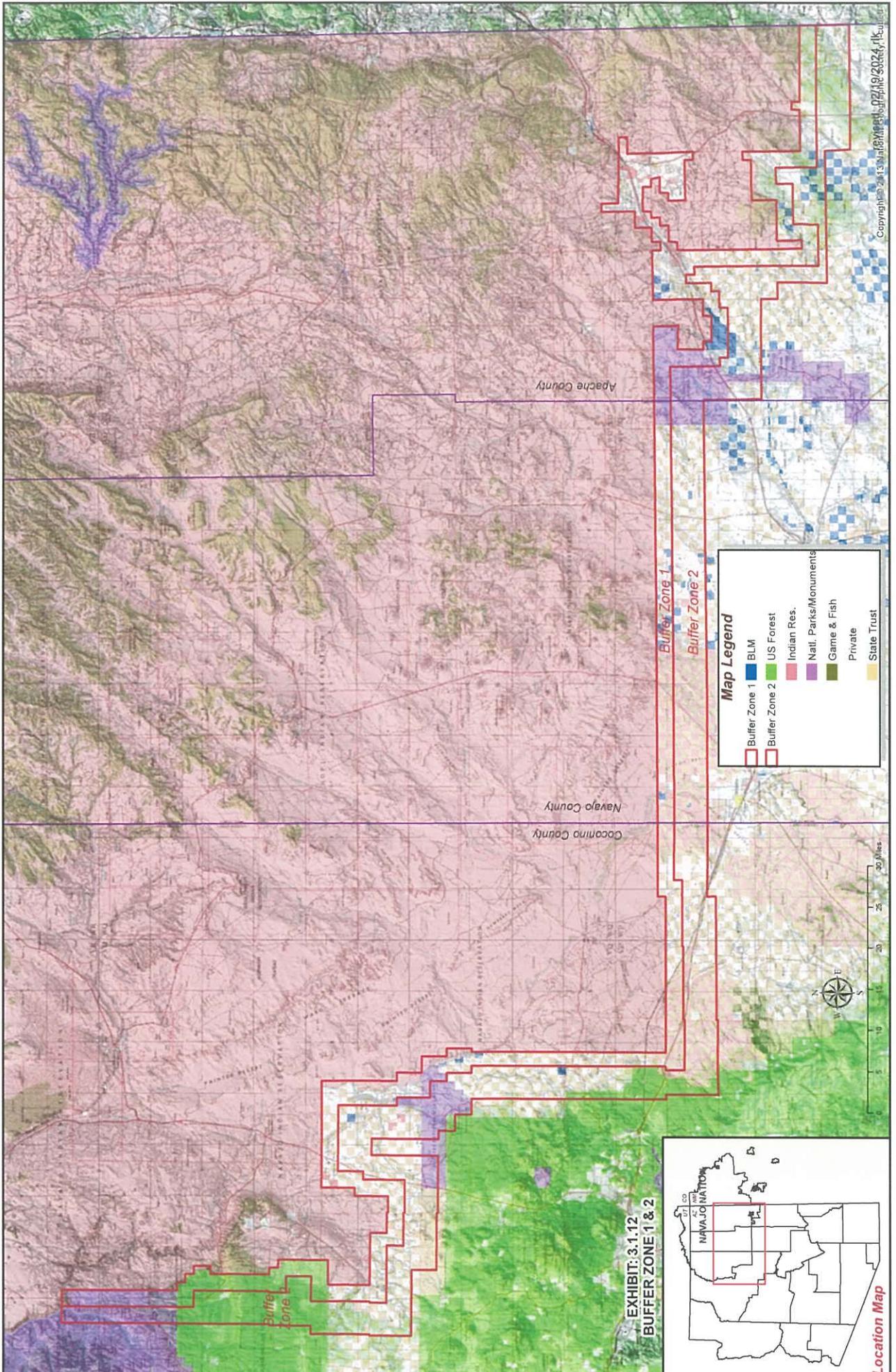
- (1) the intent to benefit a number of American Indian tribes;
  - (2) the Navajo Nation's location in both the Upper Basin and the Lower Basin;
  - (3) the intent to address critical Indian and non-Indian water needs in the State of Arizona;
  - (4) the lack of other reasonable alternatives available for developing a firm, sustainable supply of municipal water for the Navajo Nation, the Hopi Tribe, and the San Juan Southern Paiute Tribe in the State of Arizona; and
  - (5) the limited volume of water to be diverted by the iiná bá - paa tuwaqat'si pipeline and Navajo-Gallup Water Supply Project to supply municipal uses in the State of Arizona.
- (g) EFFICIENT USE. The diversions and uses authorized for the iiná bá - paa tuwaqat'si pipeline under this Act represent unique and efficient uses of Colorado River apportionments in a manner that Congress has determined would be consistent with the obligations of the United States to the Navajo Nation and the Hopi Tribe.
- (h) NO EFFECT ON ENFORCEMENT OF ENVIRONMENTAL LAWS. Nothing in this Act precludes the United States from enforcing the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9601 *et seq.* (including, but not limited to, claims for damages to natural resources), the Safe Drinking Water Act, 42 U.S.C. § 300f *et seq.*, the Clean Water Act, 33 U.S.C. § 1251 *et seq.*, the Resource

*May 9, 2024*

Conservation and Recovery Act, 42 U.S.C. § 6901 *et seq.*, or the regulations implementing said acts.

**EXHIBIT 3.1.12**

**ATTACHED**



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EXHIBIT 3.1.12  
BUFFER ZONE 1 & 2

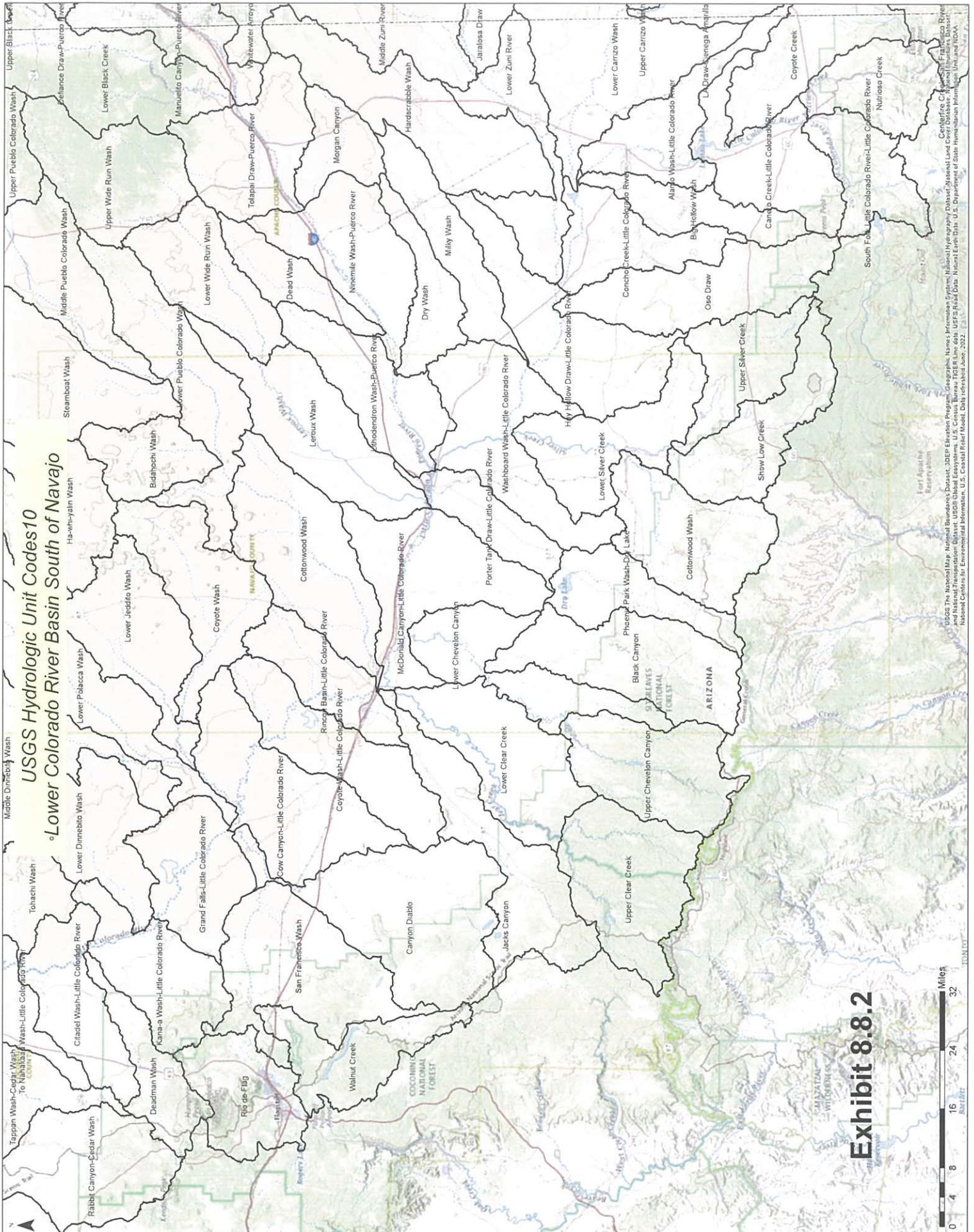


Location Map

**EXHIBIT 8.8.2**

**ATTACHED**

# USGS Hydrologic Unit Codes10 Lower Colorado River Basin South of Navajo



## Exhibit 8.8.2

USGS The National Map, National Hydrologic Dataset, Hydrologic Unit Codes, National Hydrographic Dataset, National Land Cover Database, National Wetlands Inventory, and National Water Resources Inventory. USGS Hydrologic Unit Codes, Version 10, U.S. Geological Survey, Reston, Virginia, 2012. <https://pubs.usgs.gov/of/2012/10/>

Centrifuge Corporation, Frisco River, National Hydrographic Dataset, National Land Cover Database, National Wetlands Inventory, and National Water Resources Inventory. USGS Hydrologic Unit Codes, Version 10, U.S. Geological Survey, Reston, Virginia, 2012. <https://pubs.usgs.gov/of/2012/10/>

**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Seth Gregar, Fire Captain  
**Co-Submitter:** Mark Gaillard  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



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**TITLE:**  
Annual Update of the CARE Unit

**STAFF RECOMMENDED ACTION:**

Update only

**Executive Summary:**

In FY2020-2021, the City of Flagstaff determined the number of 911 non-emergent type calls were outpacing the resources of the Flagstaff Fire Department, Flagstaff Police Department, and the local private ambulance company. These types of calls were predominately based around substance use and mental health issues. With all the available resources in the City, it was also determined that taking these clients to the hospital was not always the best option and that those resources needed to be brought together to address this community issue. The City of Flagstaff, community members and a special committee partnered together to approve and fund the CARE unit. Terros Health shared the City's vision and was awarded an initial 3-year contract as the project lead and would partner with an FF/EMT on the unit from Flagstaff Fire Department. It took months of planning, inter-agency and inter-divisional collaboration and finally hiring and training to support the new unit becoming operational.

On March 28, 2022, the unit went operational on a 10-hr workday from 9:00 a.m. to 7:00 p.m. Calls for service came through two medians, 911 Dispatch and public outreach as the unit was mobile in the community. The unit is based out of Fire Station 6 on Lake Mary Road, utilizing the community room for its headquarters.

The annual report is part of the contractual agreement between the City and Terros to provide annual statistics and updates on the function and impacts of the unit.

**Financial Impact:**

This is the final year of an agreed upon 3-year contract through October 19, 2024. Funding to continue the program has been included in the Fiscal Year 2024-2025 budget.

**Policy Impact:**

None

**Previous Council Decision or Community Discussion:**

None

**Options and Alternatives to Recommended Action:**

None

**Connection to PBB Priorities and Objectives:**

**PBB Key Community Priorities:**

- Livable Community
- Safe & Healthy Community
- Inclusive and Engaged Community

**Connection to Regional Plan:**

None

**Connection to Carbon Neutrality Plan:**

None

**Connection to 10-Year Housing Plan:**

None

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**Attachments:**    CARES annual update



# Care Unit Annual Report

July 2, 2024



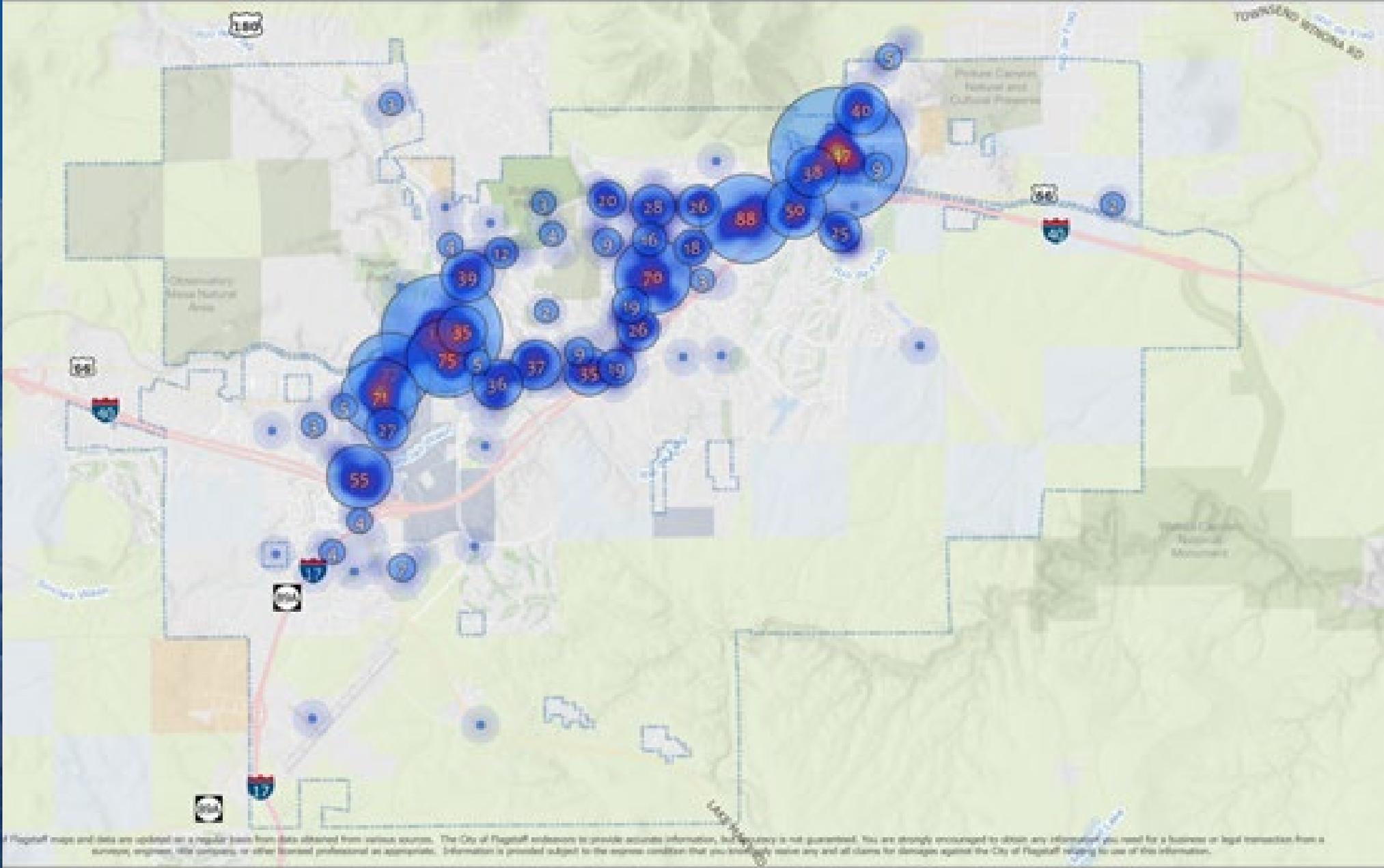


# History



- Vision of the Council
- Create an alternative response model
- Terros and Flagstaff Fire
- Started on March 28, 2022
- Crisis Clinician
- Firefighter/EMT
- Community Support/Reduction on Public Safety
  - 911 dispatch (OMEGA)
  - Proactive outreach

# CARE 2023 Call Locations





# Calls for Service

## Over 2000 dispatches since January 2023

- Less light and siren responses reducing risk of traffic accidents
- Keeps all risk units more available for true emergencies
- 1680 calls diverted from the Emergency Department
- Equates to over 10% of total Fire Department Calls

## Over 1000 outreach attempts

- Providing resources and needs
- Stabilization of the community



# FPD & FFD Calls for Service

	2019	2020 *	2022	2023
FPD Mental Health Related Calls	2,491	2,896	3,067	3,070
FPD Low Priority Alcohol Related Calls	2,828	3,318	3,842	3,388
FPD Number of Arrestees Transported to FMC**	346	1,021	270	67
FPD Hours Spent at FMC with Arrestees	480	649	476	408
FFD Man Down Responses	2,618	2,438	1,824	1,848
FFD Behavioral Health Related Responses	383	426	537	789



# Reductions

- Reduction in man down responses for FFD
  - Capturing 3rd party/drive by callers
- Reduction in arrests/ bookings during CARE hours of operation since inception

ARRESTS (9am to 7pm)			
	2020	2022	2023
Public Consumption	337	51	84
Trespass (2nd/3rd)	154	96	76
Alcohol Shoplifts	69	43	32
Obstruction	43	10	28
Obscene Conduct	41	18	15
Public Sexual Indecency	12	8	3
<b>Total:</b>	<b>656</b>	<b>226</b>	<b>238</b>

Data courtesy of Flagstaff Police Department



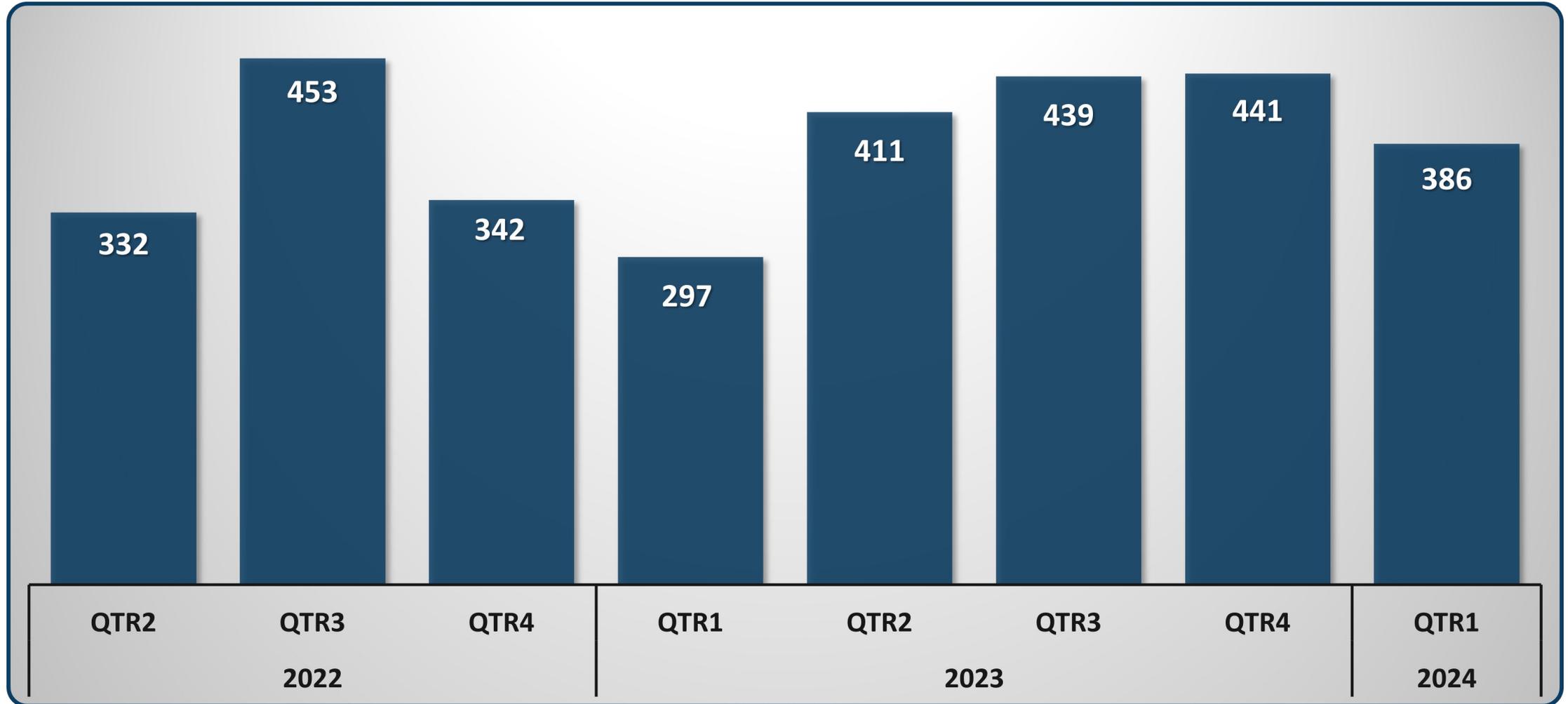
# OMEGA dispatch



- Created to send the right unit to lower acuity incident 911 calls
- Upgrades to a full medical call approximately 15% of the time
- 112 After hours (1900-0900) OMEGA calls for last 5 months

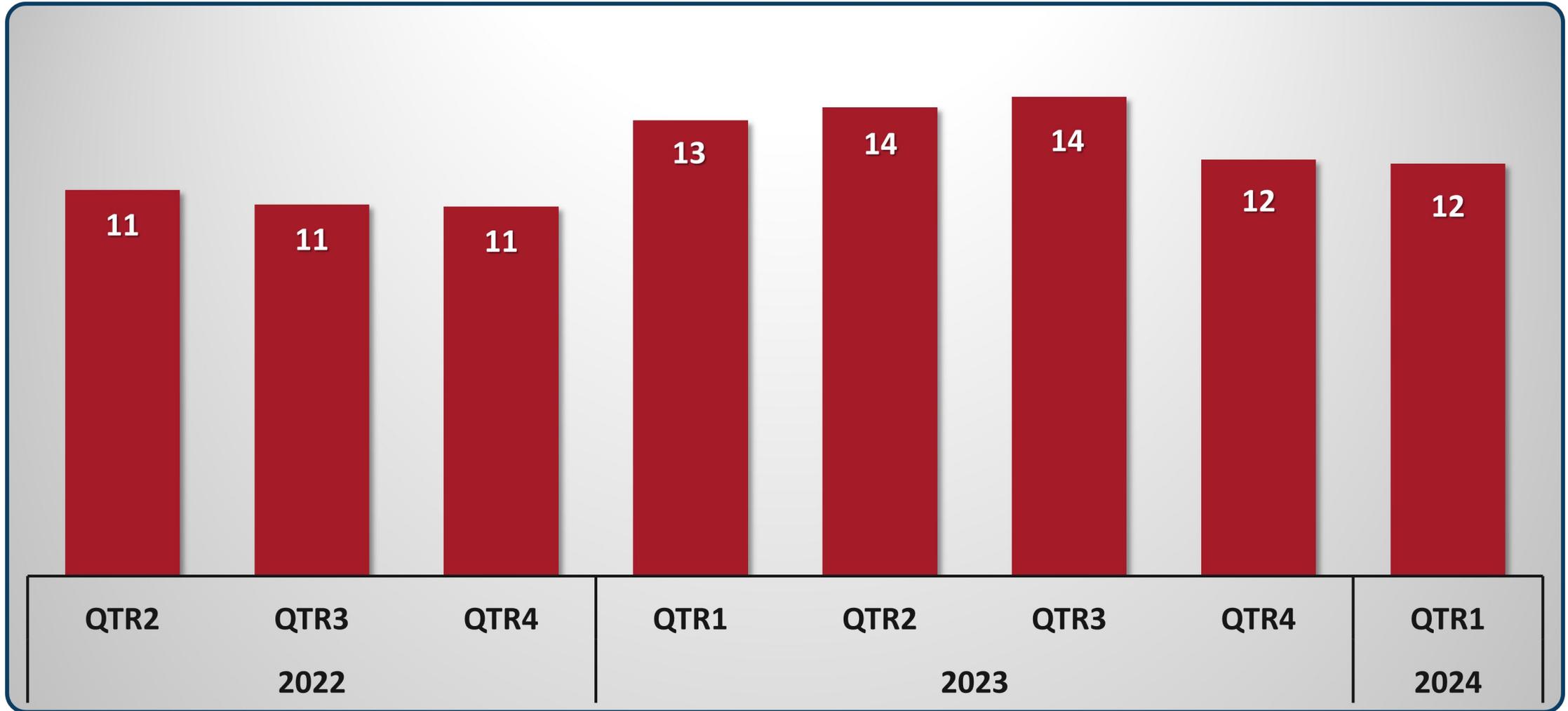


# Dispatches Per Quarter



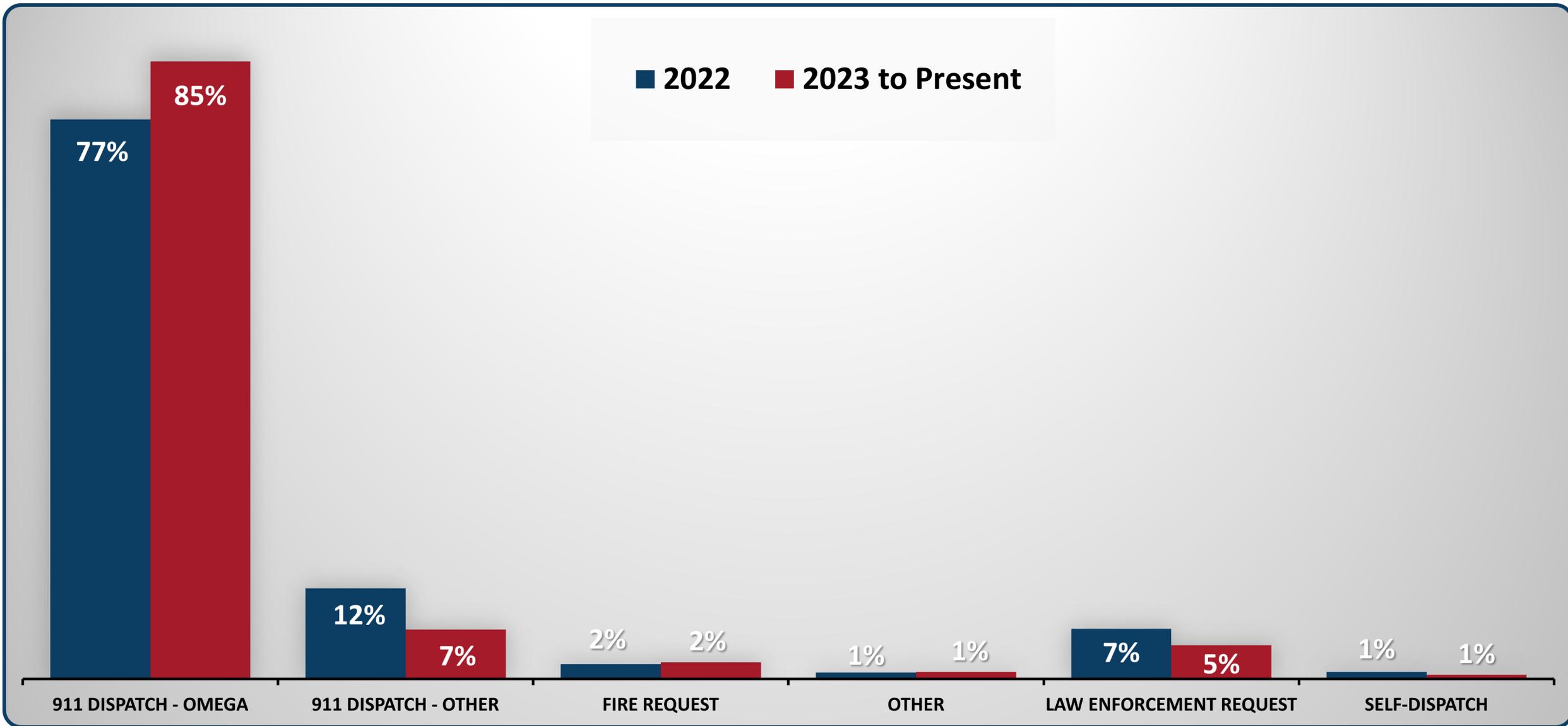


# Response Times (Minutes)



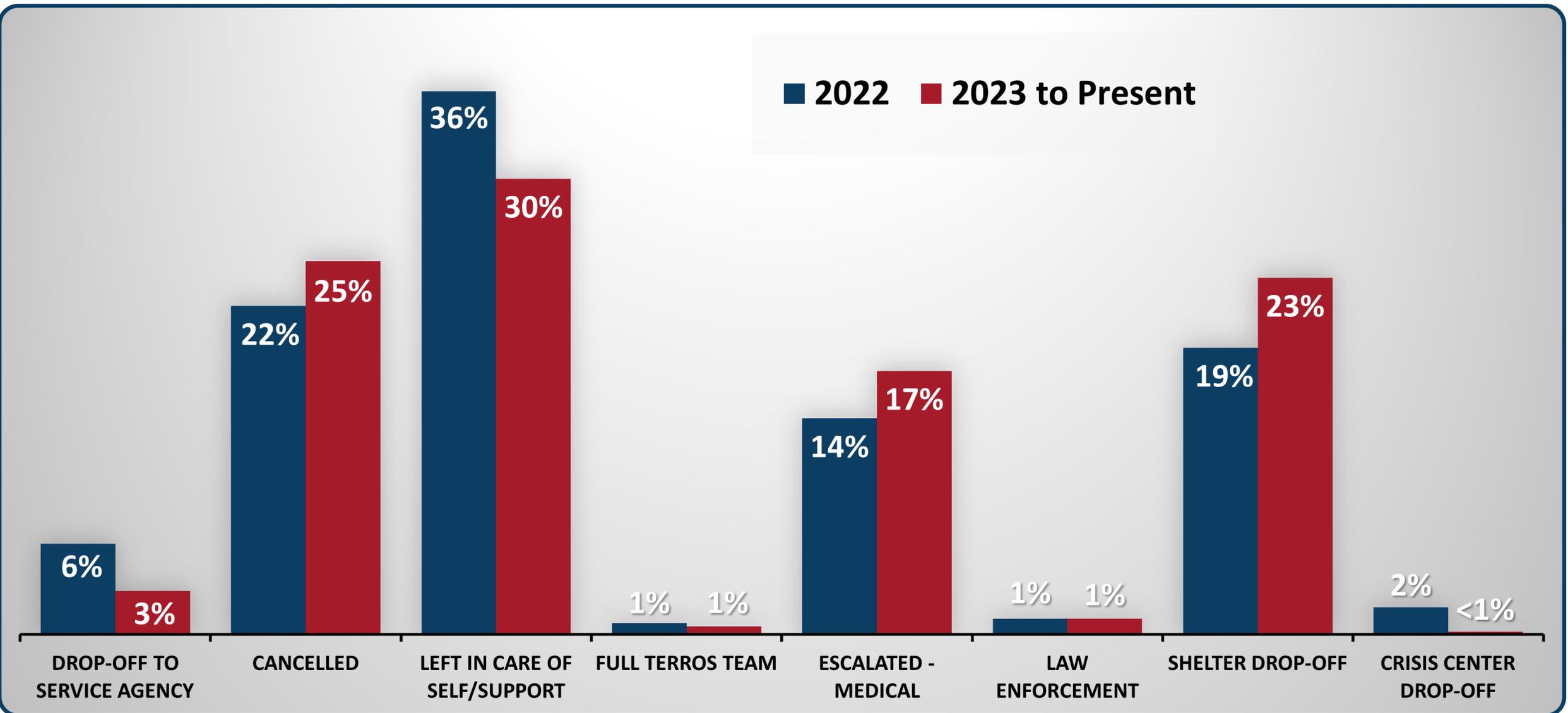


# Type of Dispatch



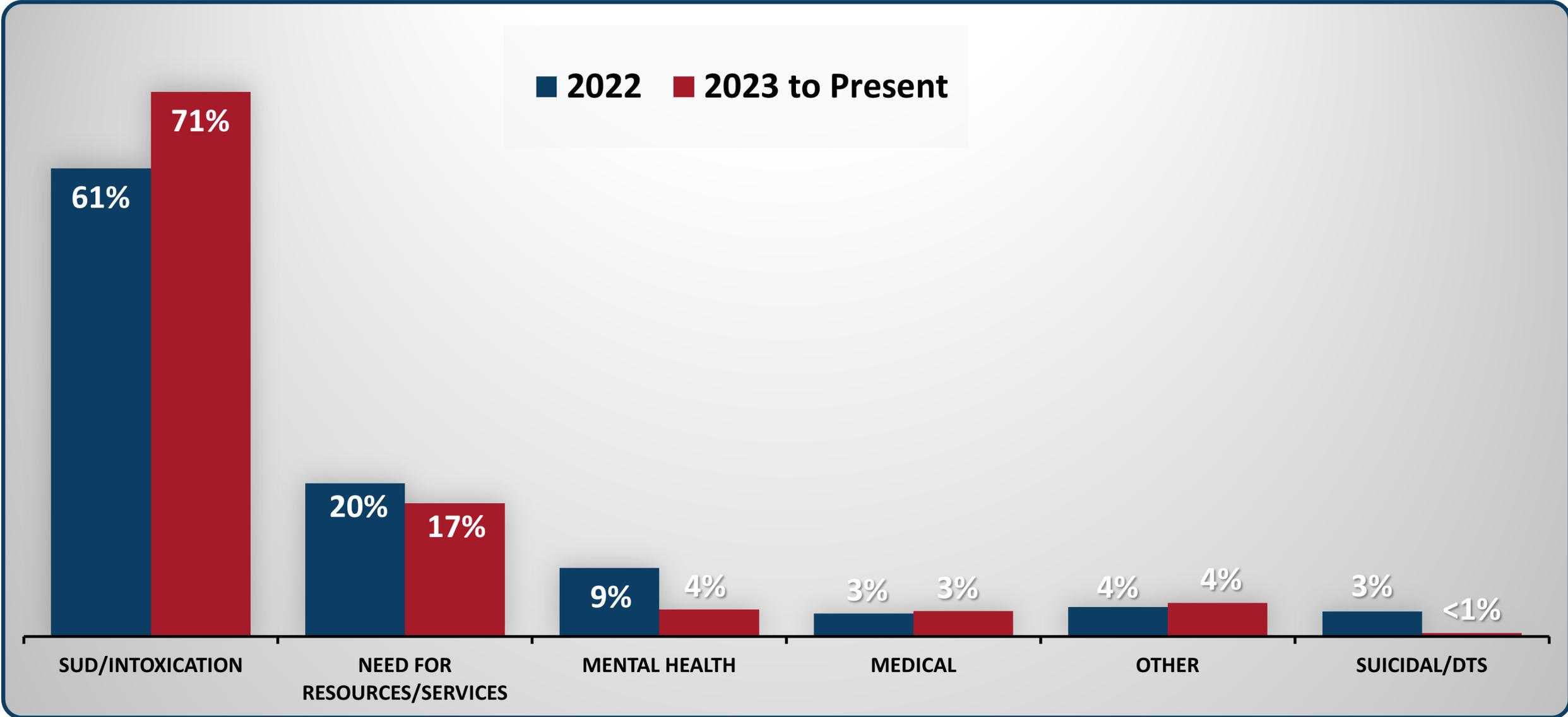


# Response Outcomes





# Primary Issue On Scene





# Proactive Outreach

- Make rounds throughout the city when not dispatched
- Build rapport with individuals and the community
- Most common stops include:
  - Downtown: Wheeler park/library, bus transfer station
  - West side: Safeway, Walmart shopping centers, Milton
  - East Side: Flagstaff Shelter, Food bank, Bushmaster, Safeway
- Distribution of basic needs and resources



# Distribution of Basic Needs

- Over 1000 Sandwiches
- Nearly 1000 bottles of water
- Approximately 200 bus passes
- Around 100 blankets
- Dozens of winter coats, hats, gloves, sleeping bags
- Narcan for opioid overdose prevention
- Informational pamphlets for community resources



# Real Experiences



- The CARE unit's effects on the community goes beyond Data Sets



# Community Partners

- Flagstaff Shelter Services
- The Guidance Center
- Flagstaff Family Food Bank
- The Salvation Army
- SMR
- Mountain Line Bus
- NACA (Native American for Community Action)
- Continuum of Care
- And many others



# Ongoing Challenges

- Ongoing need for direct Fire management over CARE under current configuration
- Challenges with data collection between agencies
- This current model is taking calls off our fire and PD units
- Dispatch models to hold the unit its intended scope
- Facilities for CARE staff and clients.
- Is this the most appropriate staffing model for our community and our employees?



# What's next



- Collaboration meeting with community partners across the city to strengthen relationships to provide better service
  - Continuum of Care
- Terros now contracted with CES Partnerships for CARE Program Evaluation
- Initial contract ends October 19, 2024
  - Option for two additional years



# In Conclusion

CARE is doing what we had intended it to do

- ✓ Reduce low acuity calls for FFD and FPD
- ✓ Reduce the numbers of arrests/ bookings for alcohol related offenses
- ✓ Reduce the number of transports to the emergency department for intoxication or detox issues
- ✓ Provide a tool for addressing community needs (proactive outreach)
- ✓ Allow all-risk units to be more available for emergencies
- ✓ Help connect and transport unsheltered clients to centralized resources



**TEAM FLAGSTAFF**



**WE MAKE THE CITY BETTER**

# Council Questions & Discussion



**CITY OF FLAGSTAFF  
STAFF SUMMARY REPORT**

**To:** The Honorable Mayor and Council  
**From:** Shannon Anderson, Senior Deputy City Manager  
**Co-Submitter:** Daniel Musselman, Police Chief  
**Date:** 06/26/2024  
**Meeting Date:** 07/02/2024



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**TITLE**

**Sharing of Information About Crisis Mobile Services**

**STAFF RECOMMENDED ACTION:**

This presentation is for informational purposes only.

**Executive Summary:**

The Flagstaff Police Department and Care 1st, the Northern Arizona Regional Behavioral Health Authority, will provide information about how crisis mobile services are requested and what services are provided in the City of Flagstaff.

**Information:**

The City of Flagstaff implemented the CARE unit three years ago to assist the Flagstaff Police Department and Flagstaff Fire Department with substance use and mental health related calls for service. When an individual calls 9-1-1 and they are experiencing a mental health crisis the Police Emergency Communications Specialist will determine if the call will be referred to the crisis line or the crisis mobile unit based on the situation. Currently in Coconino County, including the City of Flagstaff, Terros is the responding agency that provides this mobile crisis unit when there is an identified need. As the Regional Behavioral Health Authority, Care 1st, has identified a benefit to having another mobile crisis unit in Coconino County and they will provide information to City Council on their plans to implement this additional crisis unit.

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**Attachments:** [Presentation](#)

# Crisis System Overview With Care1st

July 2nd, 2024





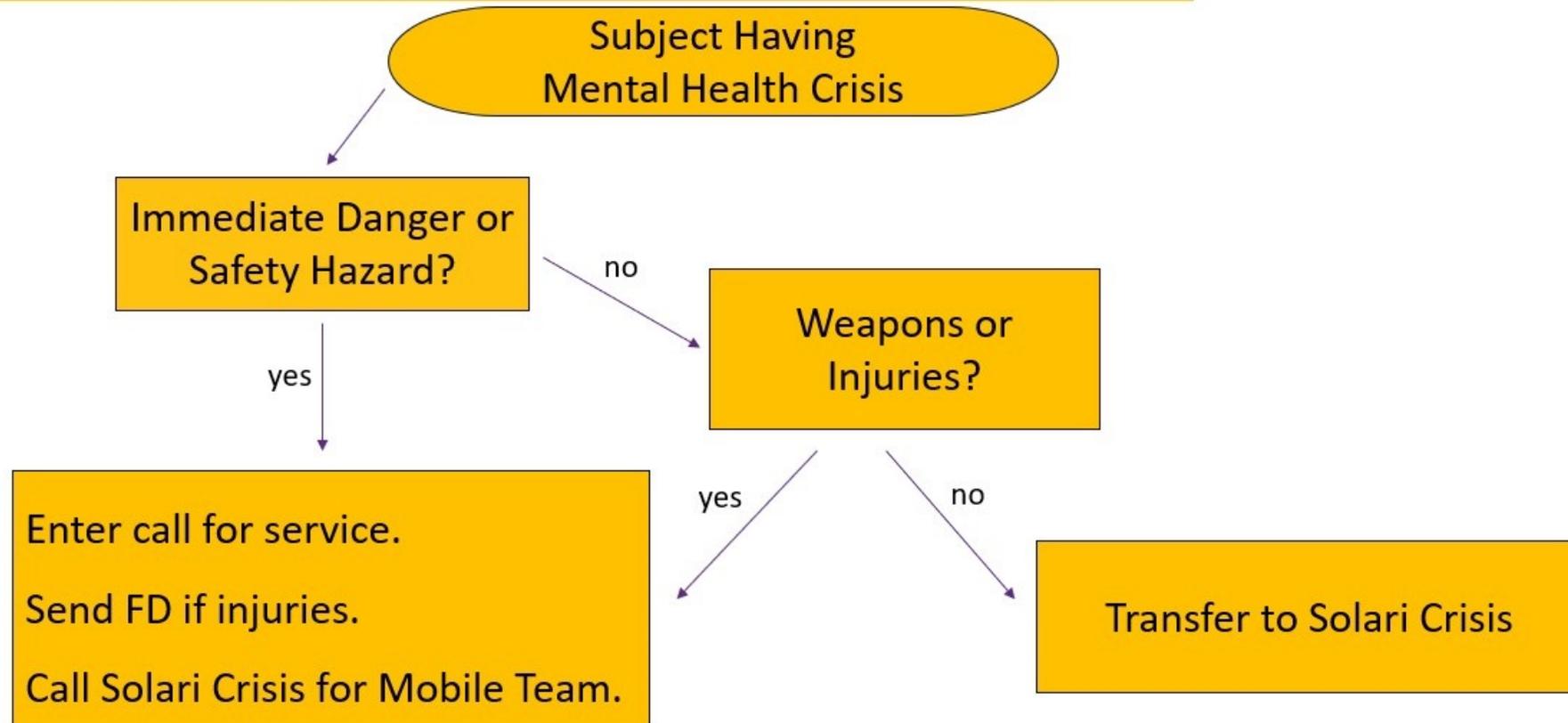
# Introductions



- Katie Brandis, Communications Manager for the Flagstaff  
Coconino Communications Center
- Bill Mitchell, Arizona Complete Health, First Responder  
Liaison – Coconino and Yavapai Counties
- Amy Devins, Arizona Complete Health, Supervisor of  
Crisis-First Responder Services



## Subject Experiencing Mental Health Crisis





# Examples of Crisis Calls



1. Depressed callers
2. Suicidal callers without access to means to cause self-harm.
3. Callers experiencing behavioral health issues (hallucinations, manic episodes, or anxiety).
4. Incurable juveniles that are not armed or exhibiting violence.
5. Third-party callers regarding mental health assistance for another person not showing violence towards others.
6. Situations that do not present a danger to the caller.
7. Frequent callers with no police or medical emergency
8. Callers experiencing any sort of crisis, homelessness, divorce, any significant change in their life, etc.



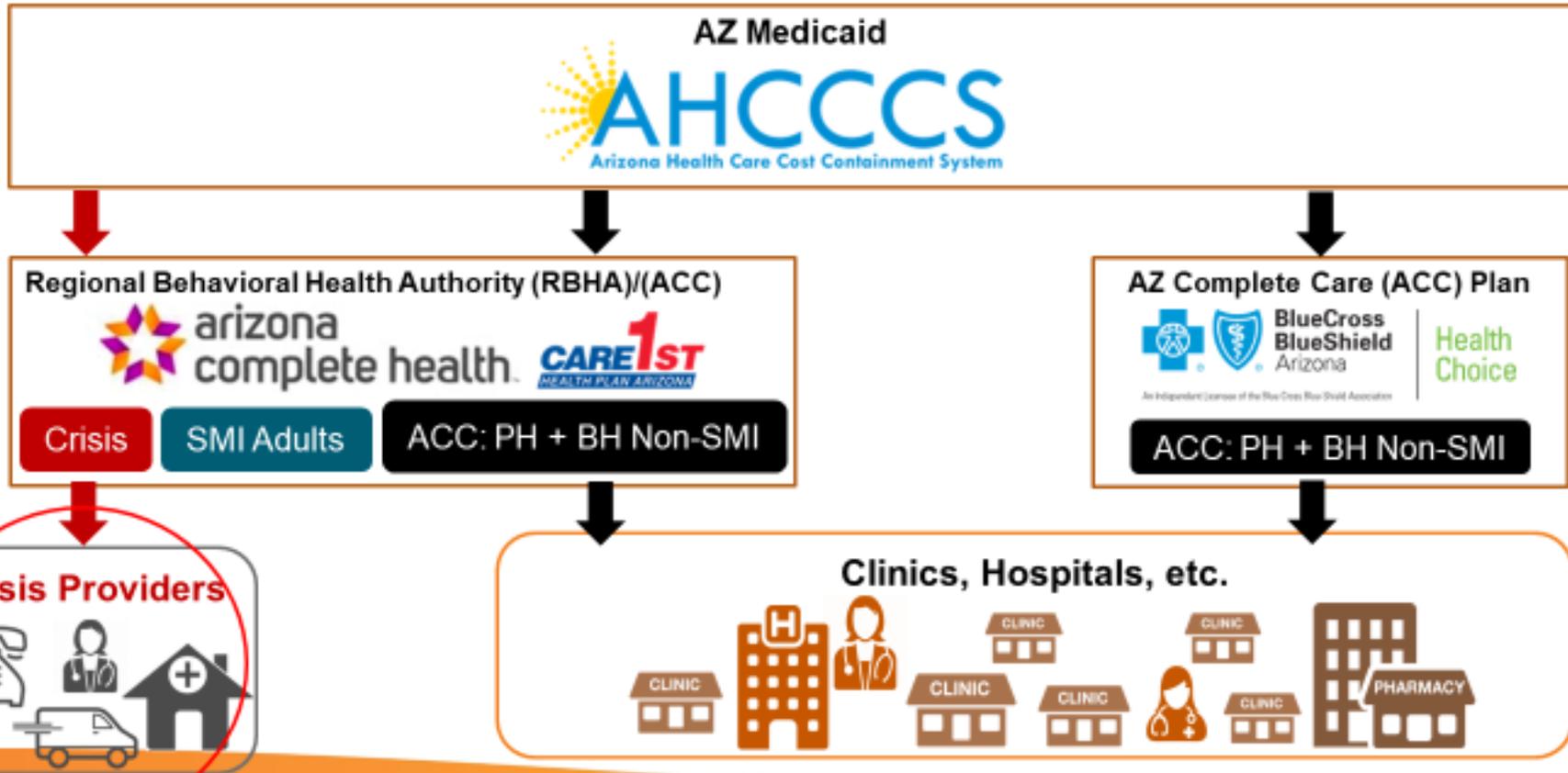
# Mobile Response Teams



- Currently Deployed:
  - Terros Mobile Response: This team is focused on providing services for those with mental and behavioral health needs.
  - Crisis Mobile Team: This team is also staffed by Terros and similar in services. This unit provides additional resources to the community, can respond county-wide and is not viewed as competing with the current CARE unit. This mobile team was recently deployed starting on June 3<sup>rd</sup>, 2024.
  - Community Alliance Response and Engagement (CARE): This unit is available 9:00 am to 7:00 pm, seven days a week, and responds within the city limits for calls of mild intoxication, minor medical issues, and can provide other resources for those unsheltered.



# Crisis System Structure (Northern GSA)





# Crisis Services: Our Approach



**EVERYONE** is eligible for crisis services, regardless of insurance status

## **Crisis Defined**

- Anything outside a person's ability to cope

## **No Wrong Door**

- 24/7 Crisis Line, Crisis Mobile Teams (CMTs) and Crisis Stabilization Units (23-hr Obs).
- Crisis never refuses

## **Community Stabilization**

- A philosophy of care where crisis intervention is done in the community versus removing a person from the community to address their crisis.

## **Real Time Escalation**

- 24/7 supervisor escalation support accessed via Crisis Line. AzCH/Care1st Crisis On Call support.



# The Crisis System Goals

*The Crisis System is designed for early intervention and assistance – not just when someone is a danger to themselves or others.*



## REDUCE:



- Unnecessary detentions, use of hospital emergency departments and involuntary psychiatric commitments
- “Revolving door” usage of 9-1-1 and Emergency Services

## INCREASE:

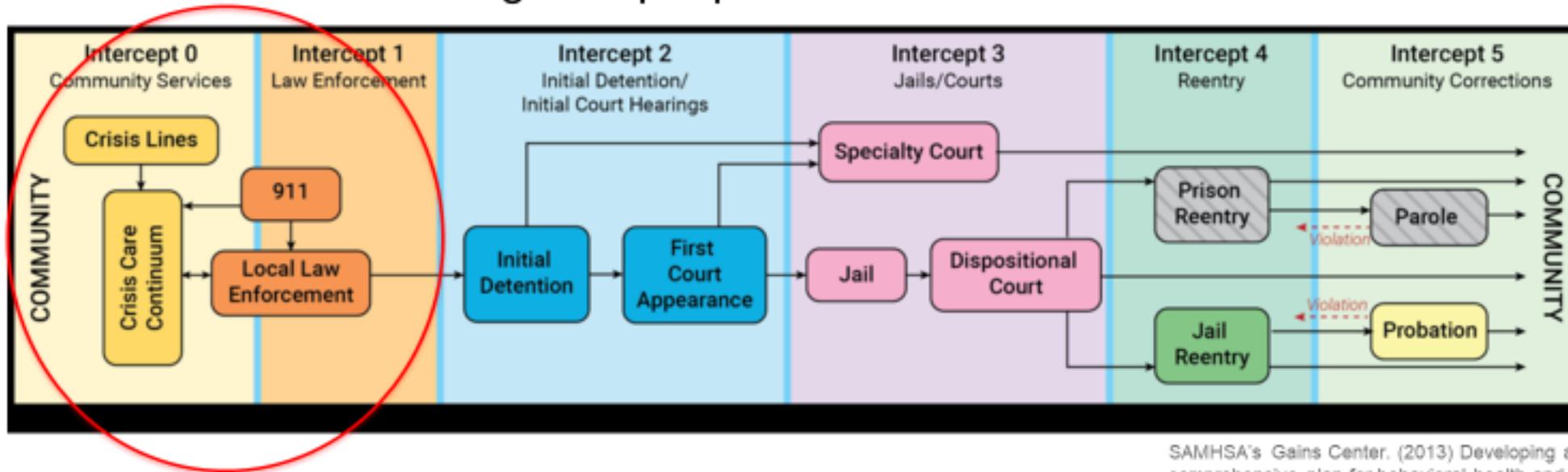


- Use of Crisis Services: Crisis Line, Crisis Mobile Teams and Crisis Centers  
*“No Wrong Door”*
- Communication and collaboration between first responders, crisis services providers, outpatient & inpatient providers, EDs, system partners, County Attorney’s Office, etc.
  - **Crisis Protocols-** Reference guide to crisis services in each county. Updated annually.
  - **Crisis System Meetings-** Quarterly county-specific venue for collaboration.
  - **Crisis Materials-** Crisis cards/flyers, LE Guide to Crisis
  - **Training-** Crisis System Overview, MHFA, CIT, Resiliency: 5 Skills, QPR, etc.

# Sequential Intercept Model



- Building best practice into the Crisis System
- Focused on creating multiple points of intervention



SAMHSA's Gains Center. (2013) Developing a comprehensive plan for behavioral health and Criminal Justice collaboration: The Sequential Intercept Model Delmar NY: Policy Research Associates Inc.



# The Crisis Line & CMTs



## The Crisis Line (CL)

**844-534-4673 (HOPE)**

*People you talk to on the phone.*

- Confidential 24/7 live answer by trained Crisis Specialists (CSs)
- Provider: **Solari**
- Stabilize, assess, coordinate, connect
- **If the crisis cannot be resolved by phone, the CL will dispatch CMT**
- Fast track calls from LEOs, 9-1-1 dispatchers, fire/EMS
- 9-1-1 Crisis Co-location



## Crisis Mobile Teams (CMTs)

*People who respond to the scene.*

- 24/7 availability
- Providers: **Terros, CBI, & Spectrum**  
Activated via the Crisis Line
- 1-2 Behavioral Health Techs (BHTs)
  - 25% Peers
- Respond, assess, coordinate, transport (transport voluntary only)
- GPS & cell dispatched
- Response within:
  - 60 min. metro & 90 min. rural
  - Current avg response time: **24 min**
- Co-locations for faster response
- Critical Incident Support



# NAZ Crisis Services Expansion: Grant Awards



- Planning for deployment of tablets for wildfire/urgent requests (NAZ).
- MHBG BSCA Grant awarded to AzCH for Crisis/Emergency Management expansion in NAZ
  - Adding two 9-1-1 Crisis Line Co-locations (in Yavapai County and Coconino County).
    - Flagstaff 9-1-1/Crisis MOU signed 4/29/24!
    - Now hiring
  - As if June, added 9-1-1-dedicated 24/7 CMT in Coconino County (similar to CARES)
  - Added additional 24/7 CMT Colorado City/Strip area
  - Funding to host two 1-Day Emergency Management/Crisis Conferences in 2024 & 2025 in NAZ.
    - Planning: Aug. 29, 2024 @ NAU High Country Conference Center, Flagstaff



# On the Horizon Additional Crisis/1<sup>st</sup> Responder Programs



## 9-1-1 Familiar Folks Program

- Partnership with interested 9-1-1 PSAPs
- Identify the most frequent 9-1-1 callers/familiar folks and engage their health plan/outpatient providers to reduce 9-1-1 reliance

## Additional Obs

- CBI
  - Youth & Adult Obs
  - Additional programs on the horizon
  - Targeting a winter opening

## Second Responder Program

- Specialty and Peer & Family Run Orgs
- Provide crisis after care services within 24 hours of receiving a crisis referral, then provide care for up to 6 weeks
- A short-term intervention to assist the outpatient BH provider with ensuring more appropriate services for the member post-crisis
  - SBH- Youth (Adult coming soon)
  - Spectrum- Youth
  - TransIntimate- LGBTQIA+ focused team



# Questions?



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