



City of Chandler, Arizona
Public Works & Utilities Department
Capital Projects Division

CONSTRUCTION BID

**RECLAIMED WATER PIPE EXTENSION –
GERMANN ROAD AND HAMILTON STREET
CITY PROJECT NO.: WW2206.404**

MAYOR

Kevin Hartke

VICE MAYOR

Christine Ellis

COUNCIL

OD Harris Matt Orlando

Angel Encinas Jane Poston Jennifer Hawkins



**Daniel Haskins, P.E.
CIP City Engineer**

CITY OF CHANDLER, ARIZONA

CONSTRUCTION BID

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INVITATION TO BID

RECLAIMED WATER PIPE EXTENSION – GERMANN ROAD AND HAMILTON STREET
CITY PROJECT NO.: WW2206.404

NOTICE IS HEREBY GIVEN that sealed bids will be received and date/time stamped by the City of Chandler Capital Projects Office, 215 East Buffalo Street, Chandler, Arizona 85225 until the bid submission date specified below.

All firms must be registered on the Arizona Procurement Portal (<https://app.az.gov/>) vendor registration system prior to submitting a Bid. Non-registered firms will not receive addenda notifications. Download the Bid Documents and any Addenda at www.chandleraz.gov/business/vendor-services/capital-projects/construction-bids. It is the contractor's sole responsibility to obtain all addenda from the City website prior to submitting their bid proposal, and to acknowledge receipt and acceptance of the addenda in their bid proposal submittal. No separate notification of addenda will be issued. The City recommends Contractors regularly check the website for updated information.

PRE-BID CONFERENCE:

	THERE WILL BE NO PRE-BID CONFERENCE
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SOLICITATION QUESTIONS DUE DATE:

April 8, 2025 5:00 p.m. Arizona time	All solicitation questions must be emailed to Bid.Questions@chandleraz.gov with the subject line of: "WW2206.404 Reclaimed Water Pipe Extension – Germann Road and Hamilton Street BID QUESTION". Questions received after the due date and time will NOT be considered.
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BID SUBMISSION:

April 22, 2025 3:00 p.m. Arizona time	Sealed bids must be delivered to the City of Chandler Capital Projects Office located at 215 East Buffalo Street, Chandler, Arizona, 85225. Bids must be received on or before date and time specified. At that time, bids will be publicly opened and read aloud in the Saguaro Conference Room. Bids received after the due date and time will be returned unopened without consideration. All bids must be submitted in a sealed envelope plainly marked as follows: BID OF _____, CONTRACTOR FOR: <i>"Reclaimed Water Pipe Extension – Germann Road and Hamilton Street"</i> <i>"WW2206.404"</i>
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Work under this Agreement includes the installation of approximately 200 linear feet of 24-inch ductile iron pipe (DIP) reclaimed waterline at the southeast corner of Hamilton Street and Germann Road, connecting to the existing 12-inch reclaimed waterline along Germann Road. Work must be completed within **150** consecutive calendar days from the Notice to Proceed. The Engineer's Estimate range is **\$1,000,000 - \$1,500,000**.

Bids must be submitted on the Proposal Form provided and be accompanied by the Bid Bond for not less than ten percent (10%) of the total bid, payable to the City of Chandler, Arizona, or a certified or cashier's check. PERSONAL OR INDIVIDUAL SURETY BONDS ARE NOT ACCEPTABLE.

The successful bidder will be required to execute the standard form of agreement for construction prior to Council award

The successful bidder must furnish a Payment Bond and Performance Bond in the amount equal to one hundred percent (100%) of the Agreement Price.

The right is hereby reserved to accept or reject any or all bids or parts thereto, to waive any informalities in any proposal and reject the bids of any persons who have been delinquent or unfaithful to any agreement with the City of Chandler.

All Bids will remain open for 90 days after the Bid opening day, but the City may, in its sole discretion, release any Bid and return the bid security prior to that date. No Bidder may withdraw his Bid during this period without written permission from the City.

Find PRELIMINARY BID RESULTS at: <https://www.chandleraz.gov/business/vendor-services/capital-projects>

Protest Policy - A protest of a proposed award must be filed WITH THE PURCHASING OFFICE within 5 calendar days of the first posting of the award recommendation. Award recommendations are posted on the Capital Projects web site or the City Clerk web site. If the due date occurs on a weekend or holiday the protest must be filed the next business day.

A Protest must include:

- The name, address and telephone number of the protester;
- The signature of the protester or its representative;
- Identification of the project and the solicitation or agreement number;
- A detailed statement of the legal and factual grounds of the protest including copies of relevant documents; and
- The form of relief requested.

City will review the protest and issue a written response.

PUBLISHED DATE:	<u>3/20/2025</u> <u>3/27/2025</u> Arizona Republic AFFIDAVIT OF PUBLICATION
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BID SUBMITTAL LIST

This list may not include all required bid submission items. It is the Contractor's responsibility to read the entire bid and determine all items required by the submission date and time.

DO NOT DOUBLE-SIDE ANY PART OF THE BID SUBMITTAL

PROJECT NAME: **Reclaimed Water Pipe Extension – Germann Road and Hamilton Street**

CITY PROJECT NO.: **WW2206.404**

PLEASE INCLUDE THE FOLLOWING ITEMS IN YOUR SUBMITTAL ACCORDING TO THE DATE AND TIME LISTED IN THE INVITATION TO BID ADVERTISEMENT:

- A. Bid Bond (Original – with Seal)
- B. Signed Proposal Acknowledgement, and licenses
- C. Bid Schedule
- D. Subcontractor's List Form
- E. Non-Collusion Bidding Certification
- F. Certificate of Insurability and Bonding
- G. Arizona Department of Revenue Privilege Tax License

BID BOND

ARIZONA STATUTORY BID BOND PURSUANT TO
TITLES 28, 34 AND 41,
OF THE ARIZONA REVISED STATUTES
(Penalty of this bond must not be less than 10% of the bid amount)

KNOW ALL MEN BY THESE PRESENTS: That, Arrowmark, LLC, (hereinafter "Principal"), as Principal, and Employers Mutual Casualty Company, (hereinafter "Surety"), a corporation organized and existing under the laws of the State of Iowa, with its principal offices in Des Moines, IA, holding a certificate of authority to transact surety business in Arizona issued by the Director of the Department of Insurance pursuant to Title 20, Chapter 2, Article 1, as Surety, held and firmly bound unto City of Chandler, (hereinafter "Obligee"), as Obligee, in the amount of Ten Percent (10%) of the amount of the bid of Principal, submitted by Principal to the Obligee for the work described below, for the payment of which sum, the 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 construction of:

Reclaimed Water Pipe Extension - Germann Road and Hamilton Street
City Project No.: WW2206.404

NOW, THEREFORE, if the Obligee shall accept the proposal of the Principal and the Principal shall enter into an agreement with the Obligee in accordance with the terms of the proposal and give the bonds and certificates of insurance as specified in the agreement document with good and sufficient surety for the faithful performance of the agreement and for the prompt payment of labor and materials furnished in the prosecution of the agreement, or in the event of the failure of the Principal to enter into the agreement and give the bonds and certificates of insurance, if the Principal pays to the Obligee the difference not to exceed the penalty of the bond between the amount specified in the proposal and such larger amount for which the Obligee may in good faith contract with another party to perform the work covered by the proposal then this obligation is void. Otherwise it remains in full force and effect provided, however, that this bond is executed pursuant to the provisions of Section 34-201, Arizona Revised Statutes, and all liabilities on this bond shall be determined in accordance with the provisions of that section to the extent as if it were copied at length herein.

Witness our hands this 22nd day of April, 20 25.

Arrowmark, LLC

Employers Mutual Casualty Company

Principal

SEAL

SURETY

SEAL

By: 

By: 

Attorney-in-Fact: **Debbie Clayton**

Its: VPO of Business Development

Marsh & McLennan Agency LLC

AGENCY OF RECORD

8605 E Raintree Drive, Suite 200, Scottsdale, AZ 85260

AGENCY ADDRESS

CITY OF CHANDLER
CHANDLER, ARIZONA

**Reclaimed Water Pipe Extension – Germann Road and Hamilton Street
City Project No.: WW2206.404**

PROPOSAL ACKNOWLEDGEMENT

PROPOSAL to the City Engineer of the City of Chandler,
In compliance with the Advertisement for Bids, the undersigned bidder:

Having examined the agreement documents, site of work, and being familiar with the conditions to be met, hereby submits the following Proposal for furnishing the material, equipment, labor and everything necessary for the completion of the work listed and agrees to execute the agreement documents and furnish the required bonds and certificates of insurance for the completion of said work, at the locations and for the prices set forth on the inside pages of this form.

Understands that construction of this project shall be in accordance with all applicable Uniform Standard Specifications and Standard Details except as otherwise required by the Project Plans and Project Specific Provisions.

Understands that the Proposal shall be submitted with a Proposal guarantee of cash, certified check, cashier's check, or surety bond for an amount of not less than ten percent (10%) of the amount bid.

Agrees that upon receipt of Notice of Award from the City of Chandler, the undersigned bidder will execute the agreement documents.

Work shall be completed within **150** consecutive calendar days, beginning with the day following the starting date specified in the Notice to Proceed. Said Notice will be issued in accordance with the Project Specific Provisions "NOTICE TO PROCEED," or, when, in the opinion of the Engineer, sufficient materials are, or will be available for the continuous prosecution of the work.

Acknowledges that bid prices submitted include all applicable sales and/or use taxes, and no further compensation will be approved for these items.

The Bidder hereby acknowledges receipt of and agrees that the submitter's Proposal is based on the following Addenda:

Addendum	Date Received	Addendum No.	Date Received
_____	_____	_____	_____
_____	_____	_____	_____

PROPOSAL ACKNOWLEDGEMENT

THIS BID IS SUBMITTED BY: Arrowmark, LLC.
a corporation organized under the laws of the State of Arizona; a
partnership consisting of _____;
or individual trading as _____
and is the holder of an Arizona State Contractor's License: ROC 347447

ATTACH PHOTOCOPY

Classification A No. ROC 347447

Failure to fill in the information above, regarding the bidder being a holder of Arizona State Contractor's License is grounds for rejection of the bid.

Joint venture bid proposals will not be accepted for projects bidding in the amount (for base bid) of less than \$5 million dollars.

Contractors are reminded it is a violation of State law to submit a bid if not properly licensed. Bids submitted without designating the Contractor's license classification and number, in the spaces provided above, shall be rejected. Bids submitted by Contractors without the required license shall be rejected.

Contractor acknowledges by signing below that bid prices submitted include all applicable sales and/or use taxes, and no further compensation shall be approved for these items. If there is a conflict between the unit bid price and the unit price extension for a particular pay item, the unit prices shall govern, per MAG 102.5. Also, per MAG 102.7, a proposal shall be considered irregular and may be rejected if there are unauthorized additions, statements, conditional or alternate bids, or irregularities of any kind.

Respectfully submitted,

Arrowmark, LLC.

Firm

33-1885924

Federal Tax ID Number

1620 S Stapley Dr Suite 118

Mesa, AZ, 85204

Address

City, State and Zip Code

480-892-8025

Phone

By (Signature Required)

Stephen Bacon - VP of Construction

Name and Title (Print)

stephen.bacon@teamarrowmark.com

Email Address

IMPORTANT NOTICE
YOU MUST:

- REPORT DISASSOCIATION OF QUALIFYING PARTY IN WRITING WITHIN 15 DAYS. [SEE A.R.S. §32-1154(A)(18)]
- REPORT A CHANGE OF ADDRESS IN WRITING WITHIN 30 DAYS. [SEE A.R.S. § 32-1122(B)(1)]
- REPORT ANY TRANSFER OF OWNERSHIP OF 50% OR MORE IMMEDIATELY [SEE A.R.S. § 32-1151.01]
- REPORT ANY CHANGE IN LEGAL ENTITY, SUCH AS ANY CHANGE OF THE OWNERSHIP IN A SOLE PROPRIETORSHIP OR CHANGE OF A PARTNER IN A PARTNERSHIP OR THE CREATION OF A NEW CORPORATE ENTITY [SEE A.R.S. § 32-1124 (B)(F) § RULE R-4-9-110]

Arrowmark LLC

1620 S Stapley Dr #118
Mesa, AZ 85204

THIS IS YOUR IDENTIFICATION CARD
DO NOT DESTROY



LICENSE EFFECTIVE THROUGH: September 30, 2025
STATE OF ARIZONA
Registrar of Contractors CERTIFIES THAT



Arrowmark LLC

CONTRACTORS LICENSE NO. ROC 347447 CLASS A

General Commercial
General Engineering
THIS CARD MUST BE
PRESENTED UPON DEMAND

Tom Cole, Director

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Tom Cole, Director

NAME OF BIDDER: Arrowmark, LLC.

CITY OF CHANDLER

Reclaimed Water Pipe Extension – Germann Road and Hamilton Street

City Project No.: WW2206.404

BID SCHEDULE

NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	EXTENDED PRICE
1	Mobilization / Demobilization	LS	1		\$ 31,000.00
2	Survey / Staking	LS	1		\$ 12,000.00
3	MOPO	LS	1		\$ 11,700.00
4	Sidewalk Removal & Replacement	SF	750	\$ 10.00	\$ 7,500.00
5	Curb and Gutter Removal & Replacement	LF	50	\$ 85.00	\$ 4,250.00
6	4" RW Removal and Replacement	LF	50	\$ 500.00	\$ 25,000.00
7	24" RW System Piping & Fitting (DIP PC 250)	LF	200	\$1,600.00	\$ 320,000.00
8	12" Gate Valves	EA	2	\$ 6,500.00	\$ 13,000.00
9	4" Gate Valves	EA	1	\$ 5,000.00	\$ 5,000.00
10	24" Gate Valves Installation (Valves Supplied by the OWNER)	EA	2	\$ 15,000.00	\$ 30,000.00
11	Pavement Removal and Replacement	SY	100	\$ 350.00	\$ 35,000.00
12	Permanent Pavement Marking	LF	150	\$ 35.00	\$ 5,250.00
13	SRP Power Pole Bracing	LS	1		\$ 5,500.00
14	Landscaping Restoration	LS	1		\$ 10,000.00
15	Traffic Control	LS	1		\$ 50,000.00
16	Stormwater Pollution Prevention Plan	LS	1		\$ 3,300.00
17	GIS Documentation	LS	1		\$ 1,500.00
18	Water Usage Allowance	AL	1	5,000	\$ 5,000
19	Slurry Seal Allowance	AL	1	10,000	\$ 10,000
20	Off-Duty Police Officer Allowance	AL	1	50,000	\$ 50,000
21	Owner's Allowance	AL	1	200,000	\$ 200,000

TOTAL BASE BID: \$ 835,000.00

Note 1: Bidders must fill in all blank spaces with an entry. Bids submitted with blank spaces will be considered "Non-Responsive".

Note 2: Bids will be opened and read aloud at an open public meeting at the time and place designed in the invitation for bids. Bids will not be modified after the bid opening. A bidder withdrawing a bid after the bid opening will be deemed non-responsible and the City may make a claim against the bidder's bid bond.

Note 3: The City reserves the right to determine the low bidder based on the Base Bid with or without any Bid Alternate(s).

SUBCONTRACTOR'S LIST FORM

**Reclaimed Water Pipe Extension – Germann Road and Hamilton Street
City Project No.: WW2206.404**

If Bidder intends to subcontract any portion of this Agreement, the bidder must submit the name, address, and contractor's license number (if applicable) of each subcontractor, including the work component of such subcontracting. Include this form with the bid submittal documents. Prime Contractor must self-perform according to MAG Specification 108.2. Bidder may make multiple copies of this form as needed.

Company Name:	CJWE, LTD	Company Name:	AWP Safety
Contact Name:	Christopher J Wilson	Contact Name:	John Hunt
Contact Email:	cwilson@cjweltd.com	Contact Email:	john.hunt@awpsafety.com
Contact Phone:	602-405-5122	Contact Phone:	602-714-4177
Work Component:	Survey	Work Component:	Traffic Control
Percentage of Total Work Performed:	.01 %	Percentage of Total Work Performed:	.03 %

Company Name:		Company Name:	
Contact Name:		Contact Name:	
Contact Email:		Contact Email:	
Contact Phone:		Contact Phone:	
Work Component:		Work Component:	
Percentage of Total Work Performed:		Percentage of Total Work Performed:	

Company Name:		Company Name:	
Contact Name:		Contact Name:	
Contact Email:		Contact Email:	
Contact Phone:		Contact Phone:	
Work Component:		Work Component:	
Percentage of Total Work Performed:		Percentage of Total Work Performed:	
Subcontractor Total Work Performed:	\$ 35,480.00	Overall Bid Total:	\$ 835,000.00
Overall Prime Contractor Self-performance %:		99.96 %	

NON-COLLUSION BIDDING CERTIFICATION

(STATE OF) Arizona

ss.

(COUNTY OF) Maricopa

I, Stephen Bacon of the City of Mesa,
in the County of Maricopa and the State of Arizona, of full age,
being duly sworn according to the law of my oath depose and say that:

I am Stephen Bacon a, VP of Construction
(Name) (Title, Position, etc.)

of the firm of Arrowmark, LLC., the Bidder making
the Bid for City of Chandler, **Reclaimed Water Pipe Extension – Germann Road and Hamilton Street, City
Project No. WW2206.404** and that I executed the said Bid with full authority so to do; that said Bidder has not,
directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken any action in
restraint of free, competitive bidding in connection with the above named Project; and that all statements
contained in said Bid and in this affidavit are true and correct, and made with full knowledge that the City of
Chandler relies upon the truth of the statements contained in said Bid and in the statements contained in this
affidavit in awarding the Contract for the said Project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure such
Contract upon an agreement of understanding, for a commission, percentage, brokerage or contingent fee,
except bonafide employees or bonafide established commercial or selling agencies maintained by:



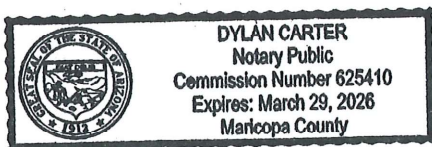
(Signature of Bidder)

Stephen Bacon

(Printed or Typed Name of Bidder)

Sworn to before me this 22nd day of April, 2025, in the County
of

Maricopa, State of Arizona.





(Notary Public)

CERTIFICATE OF INSURABILITY AND BONDING

I hereby certify that as Bidder to City of Chandler **Reclaimed Water Pipe Extension – Germann Road and Hamilton Street, City Project No. WW2206.404**, I am fully aware of the City of Chandler's Insurance and Bonding Requirements for Contractors and that by the submission of this Bid Proposal, assure the City of Chandler that I am able to produce the insurance and bonding coverage required should I be selected to be the successful bidder.

Should I be selected to be the successful bidder by the City of Chandler, and then become unable to produce the insurance and bonding coverage specified within ten working days I am fully aware and understand that my Bid Proposal will be rejected by the City of Chandler, and that I will forfeit my posted Bid Bond.


Stephen Bacon

Signature of Bidder

VP of Construction

Title

4/22/25

Date



P.O. Box 712 • Des Moines, Iowa 50306-0712

POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT**KNOW ALL MEN BY THESE PRESENTS, that:**

1. Employers Mutual Casualty Company, an Iowa Corporation
2. EMCASCO Insurance Company, an Iowa Corporation
3. Union Insurance Company of Providence, an Iowa Corporation

4. Illinois EMCASCO Insurance Company, an Iowa Corporation
5. Dakota Fire Insurance Company, a North Dakota Corporation
6. EMC Property & Casualty Company, an Iowa Corporation

hereinafter referred to severally as "Company" and collectively as "Companies", each does, by these presents, make, constitute and appoint:

Debbie Clayton

its true and lawful attorney-in-fact, with full power and authority conferred to sign, seal, and execute the Bid Bond

Any and All Bonds

and to bind each Company thereby as fully and to the same extent as if such instruments were signed by the duly authorized officers of each such Company, and all of the acts of said attorney pursuant to the authority hereby given are hereby ratified and confirmed.

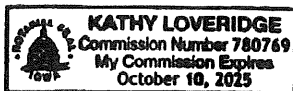
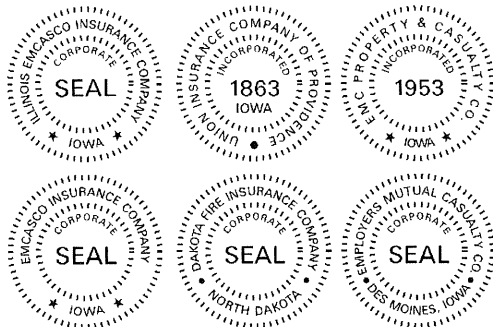
AUTHORITY FOR POWER OF ATTORNEY

This Power-of-Attorney is made and executed pursuant to and by the authority of the following resolution of the Boards of Directors of each of the Companies at the first regularly scheduled meeting of each company duly called and held in 1999:

RESOLVED: The President and Chief Executive Officer, any Vice President, the Treasurer and the Secretary of Employers Mutual Casualty Company shall have power and authority to (1) appoint attorneys-in-fact and authorize them to execute on behalf of each Company and attach the seal of the Company thereto, bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof; and (2) to remove any such attorney-in-fact at any time and revoke the power and authority given to him or her. Attorneys-in-fact shall have power and authority, subject to the terms and limitations of the power-of-attorney issued to them, to execute and deliver on behalf of the Company, and to attach the seal of the Company thereto, bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof, and any such instrument executed by any such attorney-in-fact shall be fully and in all respects binding upon the Company. Certification as to the validity of any power-of-attorney authorized herein made by an officer of Employers Mutual Casualty Company shall be fully and in all respects binding upon this Company. The facsimile or mechanically reproduced signature of such officer, whether made heretofore or hereafter, wherever appearing upon a certified copy of any power-of-attorney of the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

IN WITNESS THEREOF, the Companies have caused these presents to be signed for each by their officers as shown, and the Corporate seals to be hereto affixed this 22nd day of September, 2022.

Seals



Scott R. Jean
 Scott R. Jean, President & CEO
 of Company 1; Chairman, President
 & CEO of Companies 2, 3, 4, 5 & 6

Todd Strother
 Todd Strother, Executive Vice President
 Chief Legal Officer & Secretary of
 Companies 1, 2, 3, 4, 5 & 6

On this 22nd day of September, 2022 before me a Notary Public in and for the State of Iowa, personally appeared Scott R. Jean and Todd Strother, who, being by me duly sworn, did say that they are, and are known to me to be the CEO, Chairman, President, Executive Vice President, Chief Legal Officer and/or Secretary, respectively, of each of the Companies above; that the seals affixed to this instrument are the seals of said corporations; that said instrument was signed and sealed on behalf of each of the Companies by authority of their respective Boards of Directors; and that the said Scott R. Jean and Todd Strother, as such officers, acknowledged the execution of said instrument to be their voluntary act and deed, and the voluntary act and deed of each of the Companies.

My Commission Expires October 10, 2025.

Kathy Loveridge
 Notary Public in and for the State of Iowa

CERTIFICATE

I, Ryan J. Springer, Vice President of the Companies, do hereby certify that the foregoing resolution of the Boards of Directors by each of the Companies, and this Power of Attorney issued pursuant thereto on 22nd day of September, 2022, are true and correct and are still in full force and effect.

In Testimony Whereof I have subscribed my name and affixed the facsimile seal of each Company this 22nd day of April, 2025.

Ryan J. Springer
 Vice President

**ARIZONA DEPARTMENT OF REVENUE
PRIVILEGE TAX LICENSE**

PROJECT NAME: Reclaimed Water Pipe Extension – Germann Road and Hamilton Street

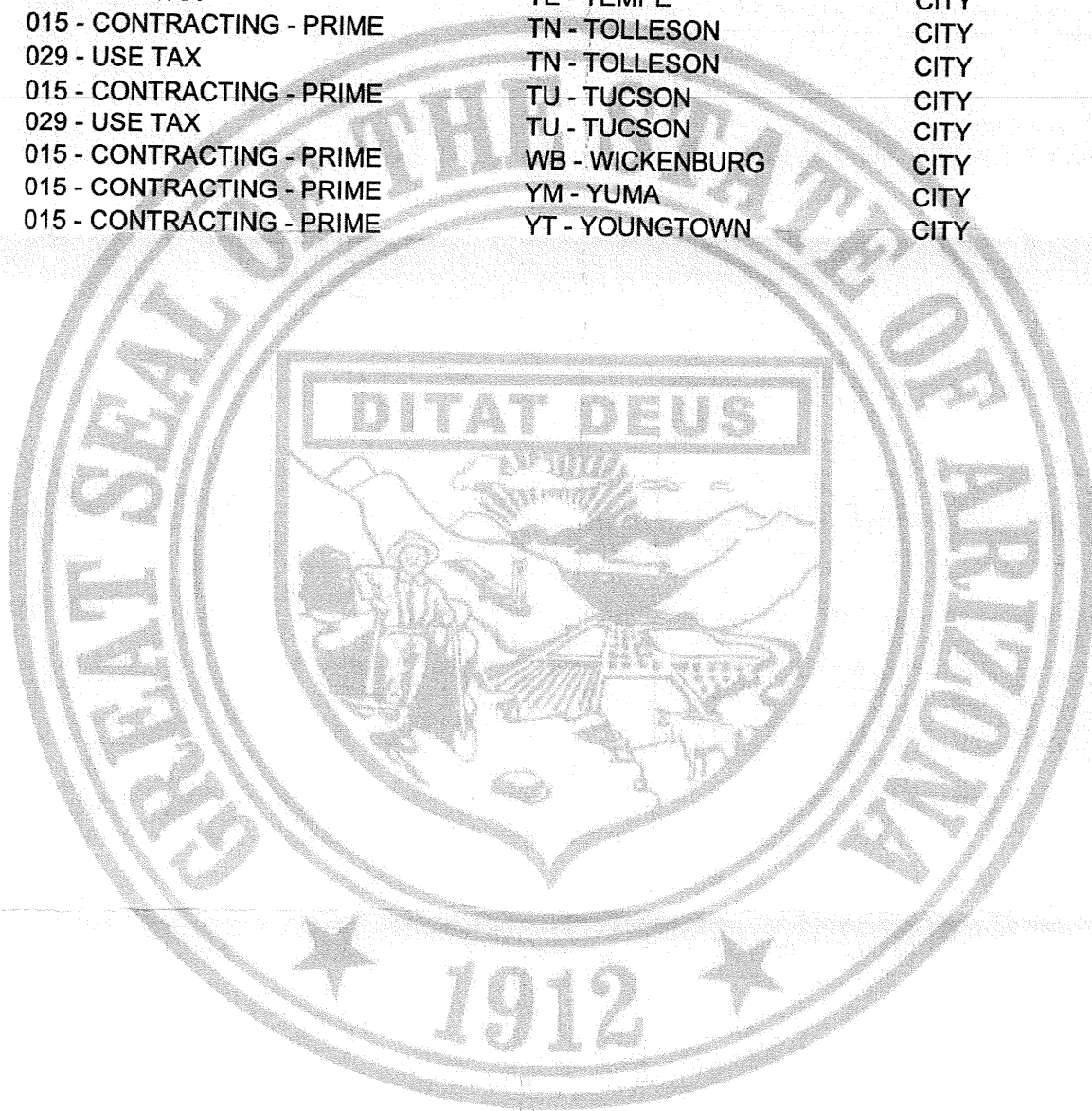
PROJECT NUMBER: WW2206.404

ATTACH, TO THIS FORM, CURRENT PRIVILEGE TAX LICENSE CERTIFICATE.

BUSINESS CODE	REGION	JURISDICTION
015 - CONTRACTING - PRIME	EL - ELOY	CITY
029 - USE TAX	EL - ELOY	CITY
015 - CONTRACTING - PRIME	EM - EL MIRAGE	CITY
029 - USE TAX	EM - EL MIRAGE	CITY
015 - CONTRACTING - PRIME	FH - FOUNTAIN HILLS	CITY
029 - USE TAX	FH - FOUNTAIN HILLS	CITY
015 - CONTRACTING - PRIME	FL - FLORENCE	CITY
029 - USE TAX	FL - FLORENCE	CITY
015 - CONTRACTING - PRIME	FS - FLAGSTAFF	CITY
029 - USE TAX	FS - FLAGSTAFF	CITY
015 - CONTRACTING - PRIME	GB - GILBERT	CITY
015 - CONTRACTING - PRIME	GE - GLENDALE	CITY
029 - USE TAX	GE - GLENDALE	CITY
015 - CONTRACTING - PRIME	GI - GILA BEND	CITY
029 - USE TAX	GI - GILA BEND	CITY
015 - CONTRACTING - PRIME	GL - GLOBE	CITY
029 - USE TAX	GL - GLOBE	CITY
015 - CONTRACTING - PRIME	GU - GUADALUPE	CITY
029 - USE TAX	GU - GUADALUPE	CITY
015 - CONTRACTING - PRIME	GY - GOODYEAR	CITY
029 - USE TAX	GY - GOODYEAR	CITY
015 - CONTRACTING - PRIME	LP - LITCHFIELD PARK	CITY
029 - USE TAX	LP - LITCHFIELD PARK	CITY
015 - CONTRACTING - PRIME	MA - MARANA	CITY
029 - USE TAX	MA - MARANA	CITY
015 - CONTRACTING - PRIME	ME - MESA	CITY
029 - USE TAX	ME - MESA	CITY
015 - CONTRACTING - PRIME	MM - MIAMI	CITY
029 - USE TAX	MM - MIAMI	CITY
015 - CONTRACTING - PRIME	MP - MARICOPA	CITY
029 - USE TAX	MP - MARICOPA	CITY
015 - CONTRACTING - PRIME	PE - PEORIA	CITY
029 - USE TAX	PE - PEORIA	CITY
015 - CONTRACTING - PRIME	PL - PRESCOTT VALLEY	CITY
015 - CONTRACTING - PRIME	PR - PRESCOTT	CITY
029 - USE TAX	PR - PRESCOTT	CITY
015 - CONTRACTING - PRIME	PS - PAYSON	CITY
015 - CONTRACTING - PRIME	PV - PARADISE VALLEY	CITY
029 - USE TAX	PV - PARADISE VALLEY	CITY
015 - CONTRACTING - PRIME	PX - PHOENIX	CITY
029 - USE TAX	PX - PHOENIX	CITY
015 - CONTRACTING - PRIME	QC - QUEEN CREEK	CITY
029 - USE TAX	QC - QUEEN CREEK	CITY
015 - CONTRACTING - PRIME	SC - SCOTTSDALE	CITY
029 - USE TAX	SC - SCOTTSDALE	CITY
015 - CONTRACTING - PRIME	SE - SEDONA	CITY
029 - USE TAX	SE - SEDONA	CITY

LICENSE: 21505840

BUSINESS CODE	REGION	JURISDICTION
015 - CONTRACTING - PRIME	SF - SAFFORD	CITY
029 - USE TAX	SF - SAFFORD	CITY
015 - CONTRACTING - PRIME	SI - SUPERIOR	CITY
015 - CONTRACTING - PRIME	SL - SHOW LOW	CITY
015 - CONTRACTING - PRIME	SP - SURPRISE	CITY
029 - USE TAX	SP - SURPRISE	CITY
015 - CONTRACTING - PRIME	TE - TEMPE	CITY
029 - USE TAX	TE - TEMPE	CITY
015 - CONTRACTING - PRIME	TN - TOLLESON	CITY
029 - USE TAX	TN - TOLLESON	CITY
015 - CONTRACTING - PRIME	TU - TUCSON	CITY
029 - USE TAX	TU - TUCSON	CITY
015 - CONTRACTING - PRIME	WB - WICKENBURG	CITY
015 - CONTRACTING - PRIME	YM - YUMA	CITY
015 - CONTRACTING - PRIME	YT - YOUNGTOWN	CITY



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**CITY OF CHANDLER, ARIZONA
PUBLIC WORKS & UTILITIES DEPARTMENT
CAPITAL PROJECTS DIVISION**

CONSTRUCTION AGREEMENT

**RECLAIMED WATER PIPE EXTENSION –
GERMANN ROAD AND HAMILTON STREET**

CITY PROJECT NO.: WW2206.404

MAYOR

Kevin Hartke

VICE MAYOR

Christine Ellis

COUNCIL

OD Harris Matt Orlando

Angel Encinas Jane Poston Jennifer Hawkins

Daniel Haskins

Daniel Haskins, P.E.

CIP City Engineer

CITY OF CHANDLER, ARIZONA

RECLAIMED WATER PIPE EXTENSION – GERMANN ROAD AND HAMILTON STREET

CITY PROJECT NO.: WW2206.404

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CONSTRUCTION SERVICES AGREEMENT**PROJECT NO.: WW2206.404**

This Agreement ("Agreement") is made and entered into on the ____ day of _____, 2025, by and between City of Chandler, an Arizona municipal corporation, hereinafter called "City" and Arrowmark, LLC the "Contractor" designated below (City and Contractor may individually be referred to as "Party" and collectively referred to as "Parties").

City and Contractor agree as follows:

ARTICLE 1 - PARTICIPANTS AND PROJECT

CITY:	CIP City Engineer: Daniel Haskins, P.E. Public Works & Utilities Department P.O. Box 4008, Mail Stop 407 Chandler, AZ 85244-4008 Phone: 480-782-3335 Email: Daniel.Haskins@chandleraz.gov	
CITY:	Construction Project Manager: Adam Kleiser Public Works & Utilities Department P.O. Box 4008, Mail Stop 407 Chandler, AZ 85244-4008 Phone: 480-782-3325 Email: Adam.Kleiser@chandleraz.gov	
Contractor:	Legal Company Name:	Arrowmark, LLC
	Mailing Address:	1620 South Stapley Drive, Suite 118 Mesa, AZ 85204
	Physical Address:	1620 South Stapley Drive, Suite 118 Mesa, AZ 85204
	Arizona Roc No.:	ROC 347447 A
	Federal Tax Id No.:	33-1885924
	State Where Organized:	Arizona
	Business Organization:	LLC
	Statutory Agent Name:	Incorp Services, Inc
	Statutory Agent Mailing Address:	8825 North 23rd Avenue, Suite 100, Phoenix, AZ 85021
	Statutory Agent Physical Address:	8825 North 23rd Avenue, Suite 100, Phoenix, AZ 85021
Contractor's Authorized Project Representative:		
	Name:	Stephen Bacon
	Title:	VP of Business Development
	Phone:	(623)521-0692
	Email:	Stephen.Bacon@teamarrowmark.com

PROJECT DESCRIPTION:

Work under this Agreement includes the installation of approximately 200 linear feet of 24-inch ductile iron pipe (DIP) reclaimed waterline at the southeast corner of Hamilton Street and Germann Road, connecting to the existing 12-inch reclaimed waterline along Germann Road.

PROJECT LOCATION:

German Road and Pioneer Parkway (Tumbleweed Park)

ARTICLE 2 - AGREEMENT DOCUMENTS

2.1 AGREEMENT DOCUMENTS

The Agreement between City and Contractor will consist of the following Agreement Documents:

1. This Construction Services Agreement and all of its Exhibits, including Project Plans and Technical Specifications.
2. General Conditions and General Conditions Appendices, incorporated by reference.
3. Project Specific Special Provisions as set forth in Exhibit A, incorporated by reference.
4. Project Bid Proposal.

2.2 In the event of any inconsistency, conflict, or ambiguity between or among the Agreement Documents, the Agreement Documents will take precedence as described in Section 14.1.4 of the General Conditions.

2.3 DEFINITIONS

The definitions in Section 2 of the General Conditions apply to all the Agreement Documents, including this Agreement.

ARTICLE 3 - CONSTRUCTION SERVICES

3.1 GENERAL

- 3.1.1 Scope of Work. All terms and conditions are set forth in the Agreement. Any terms and conditions and exceptions noted in the Contractor's proposal or other documents do not apply unless agreed to in this Agreement or an approved addendum.
- 3.1.2 Contractor agrees this is a Unit Price Agreement. Contractor agrees at its own cost and expense, to do all Work necessary required to fully, timely and properly complete the construction of the Project in strict accordance with the Agreement Documents in a good and workmanlike manner, free and clear of all claims, liens, and charges whatsoever, in the manner and under the conditions specified, within the Agreement time.
- 3.1.3 Contractor must provide all of the labor and materials, and perform the Work in accordance with Section 4 of the General Conditions. Some, but not all, of the major components of the Construction Services and the corresponding subsections of Section 4 of the General Conditions are set forth below.

- 3.1.4 At all times relevant to this Agreement and performance of the Work, the Contactor must fully comply with all Laws, Regulations, or Legal Requirements applicable to City, the Project and the Agreement, including, without limitation, those set forth on attached Exhibit A.
- 3.1.5 Contractor must perform the Work under this Agreement using only those firms, team members and individuals designated by Contractor consistent with Contractor's accepted Bid, or otherwise, approved by City pursuant to the General Conditions. No other entities or individuals may be used without the prior written approval of the Project Manager.
- 3.1.6 Contractor must comply with all terms and conditions of the General Conditions.
- 3.1.7 In the event of a conflict between this Agreement and the General Conditions or an exhibit hereto or appendix thereto, the terms of this Agreement will control.
- 3.1.8 Ownership of Work Product. Notwithstanding anything to the contrary in this Agreement, all Work Product prepared or otherwise created in connection with the performance of this Agreement, including the Work, are to be and remain the property of City. For purposes of this provision, "Work Product" will include all designs, drawings, plans, specifications, ideas, renderings and other information or matter, in whatever form created (e.g., electronic or printed) and in all media now known or hereinafter created. All Work Product will be considered Work Made for Hire as defined in the United States Copyright Act 17 U.S.C. § 101 (Copyright Act). If for any reason, any such Work is found not to be a Work Made for Hire, Contractor hereby transfers and assigns ownership of the copyright in such Work to City. The rights in this Section are exclusive to City in perpetuity.

3.2 **CONTRACTOR'S PRE-AGREEMENT AND PRE-WORK DELIVERABLES**

- 3.2.1 The Contractor must provide the Deliverables in accordance with Section 4.2 of the General Conditions.

3.3 **PRE-CONSTRUCTION CONFERENCE**

Contractor must attend the Pre-Construction Conference in accordance with Section 4.3 of the General Conditions.

3.4 **PERFORMANCE OF THE WORK (INCLUDING FIELD MEASUREMENTS, SUBCONTRACTORS, AND SUPPLIERS)**

Contractor must perform the Work in accordance with Section 4.4 of the General Conditions.

3.5 **CONTROL OF THE PROJECT SITE**

Contractor must control and maintain the Project Site in accordance with Section 4.5 of the General Conditions.

3.6 **PROJECT SAFETY**

Contractor must implement and enforce Project safety in accordance with Section 4.6 of the General Conditions.

3.7 **MATERIALS QUALITY, SUBSTITUTIONS AND SHOP DRAWINGS**

Contractor must provide materials testing and submit substitute materials and Shop Drawings in accordance with Section 4.7 of the General Conditions.

3.8 **PROJECT RECORD DOCUMENTS**

Contractor must maintain and make available the Project Record Documents in accordance with Section 4.8 of the General Conditions.

3.9 **WARRANTY AND CORRECTION OF DEFECTIVE WORK**

Contractor must provide warranties and correct defective Work in accordance with Section 4.9 of the General Conditions.

ARTICLE 4 - CITY RESPONSIBILITIES

4.1 City will have the responsibilities, and provide the information specified in, and subject to the conditions set forth in, Section 5 of the General Conditions.

ARTICLE 5 - AGREEMENT TIME

5.1 **GENERAL**

5.1.1 The total Agreement Duration is 150 Calendar Days (including Substantial Completion by 120 Calendars Days and Final Acceptance by 150 Calendar Days).

5.1.2 The Agreement Time will start with the Notice to Proceed (NTP) and end with Final Acceptance, as set forth in Article 5.4 below.

5.1.3 The Agreement Time will be as set forth in the Project Schedule. Contractor agrees that it will commence performance of the Work and complete the Project through Final Acceptance within the Agreement Time.

5.1.4 Time is of the essence of this Agreement for the Project, and for each phase and designated Milestone thereof.

- 5.1.5 Failure on the part of Contractor to adhere to the approved Project Schedule will be deemed a material breach and sufficient grounds for termination of this Agreement by City.

5.2 PROJECT SCHEDULE

- 5.2.1 The Project Schedule will be updated and maintained throughout Contractor's performance under this Agreement in accordance with Section 6.2 of the General Conditions.

- 5.2.2 Work must be completed to meet the following milestones after the Notice to Proceed:

	Milestone		Time	Liquidated damages for delay	
1.		within	days	\$	per calendar day

5.3 SUBSTANTIAL COMPLETION

Substantial Completion must be achieved no later than the Substantial Completion Date set forth in the Project Schedule. Substantial Completion will be determined in accordance with Section 6.3 of the General Conditions.

5.4 FINAL ACCEPTANCE

- 5.4.1 Final Acceptance will be obtained within the time period set forth in the Project Schedule.

- 5.4.2 Final Acceptance will be issued pursuant to Section 6.5 of the General Conditions.

5.5 LIQUIDATED DAMAGES

- 5.5.1 Substantial Completion Liquidated Damages. Contractor acknowledges and agrees that if Contractor fails to obtain Substantial Completion of the Work within the Agreement Time, City will sustain extensive damages and serious loss as a result of such failure. The exact amount of such damages will be extremely difficult to ascertain. Therefore, City and Contractor agree that if Contractor fails to achieve Substantial Completion of the Work within the Agreement Time, City will be entitled to retain or recover from Contractor, as liquidated damages and not as a penalty, the sum per calendar day as indicated in MAG § 108.9.

- 5.5.2 Final Acceptance Liquidated Damages. For the same reasons set forth in Article 5.5.1 above, City and Contractor further agree that if Contractor fails to achieve Final Acceptance of the Work within the Agreement Time, City will be entitled to retain or recover from Contractor, as liquidated damages and not as a penalty, the sum per

calendar day as indicated in MAG § 108.9 commencing from the actual date of Substantial Completion or Final Acceptance as required under the Agreement.

5.5.3 MAG Liquidated Damages. Liquidated damages provisions in MAG § 108.9 will apply.

5.5.4 City may deduct liquidated damages described in this Article 5.5 from any unpaid amounts then or thereafter due Contractor under this Agreement. Any liquidated damages not so deducted from any unpaid amounts due Contractor will be payable to City at the demand of City, together with interest from the date of the demand at the highest lawful rate of interest payable by Contractor.

5.6 **MUTUAL WAIVER OF CONSEQUENTIAL DAMAGES ONLY**

5.6.1 Contractor and City waive claims against each other for consequential damages arising out of or relating to this Agreement. This mutual waiver includes.

1. Damages incurred by City for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
2. Damages incurred by Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

5.6.2 This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination of this Agreement. Nothing contained in this Article 5.6 will be deemed to preclude an award of liquidated damages, when applicable, in accordance with Article 5.5 above.

5.6.3 Nothing herein will be deemed to constitute a waiver of any other remedy available to City in the event of Contractor's default under this Agreement prior to full performance of the Work including, as applicable, specific performance or completion of the Work on behalf of Contractor, the cost and expense of which will be offset against any monies then or thereafter due to Contractor (if any) and otherwise immediately reimbursed to City by Contractor.

ARTICLE 6 - AGREEMENT PRICE

6.1 **AGREEMENT PRICE**

6.1.1 In exchange for Contractor's full, timely, and acceptable performances and construction of the Work under this Agreement, and subject to all of the terms of this Agreement, City will pay Contractor the "Agreement Price," which is \$835,000.

6.1.2 The Agreement Price is all-inclusive and specifically includes all fees, cost, insurance and bond premiums, and taxes of any type necessary to fully, properly and timely perform and construct Work.

6.2 CHANGES TO AGREEMENT PRICE

Shall be determined under Section 9 of the General Conditions.

ARTICLE 7 - PAYMENT

Payments will be made to Contractor in accordance with Section 8 of the General Conditions.

ARTICLE 8 - CHANGES TO THE AGREEMENT

Changes to the Agreement may be made in strict accordance with Section 9 of the General Conditions.

ARTICLE 9 - SUSPENSION AND TERMINATION

This Agreement may be suspended or terminated in accordance with Section 10 of the General Conditions.

ARTICLE 10 - INSURANCE AND BONDS

10.1 Contractor must provide insurance in accordance with Sections 11.1 through 11.3 of the General Conditions. Contractor must provide proof of such insurance and all required endorsements in forms acceptable to City prior to commencing any Work under this Agreement.

10.2 Contractor must provide performance and payment bonds to City in Accordance with Section 11.4 of the General Conditions and A.R.S. § 34-222.

10.3 Failure to provide proof of insurance and the required endorsements, or the required bonds, in forms acceptable to City, will be a material breach and grounds for termination for cause of this Agreement.

ARTICLE 11 - INDEMNIFICATION

Contractor must have and assume the indemnity obligations set forth in Section 12 of the General Conditions.

ARTICLE 12 - DISPUTE RESOLUTION

Any claims or disputes relating to this Agreement will be resolved according to the dispute resolution process set forth in Section 13 of, and Appendix 6 to, the General Conditions.

ARTICLE 13 - FORCED LABOR OF ETHNIC UYGHURS PROHIBITED

By entering into this Agreement, Contractor certifies and agrees Contractor does not currently use and will not use for the term of this Agreement: (i) the forced labor of ethnic Uyghurs in the People's Republic of China; or (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.

SIGNATURE PAGE TO FOLLOW

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement through their duly authorized representatives and bind their respective entities as of the effective date.

"CITY"
CITY OF CHANDLER

"CONTRACTOR"
ARROWMARK, LLC.

MAYOR

Stephen Bacon May 12, 2025
Signature Date

RECOMMENDED BY:

Stephen Bacon
Print Name

Daniel Haskins May 12, 2025
Daniel Haskins, P.E.
CIP City Engineer

VP of Business Development
Title

stephen.bacon@teamarrowmark.com
Signer Email Address

APPROVED AS TO FORM:

City Attorney 

ATTEST:

City Clerk Seal

EXHIBIT A
PROJECT SPECIFIC
SPECIAL PROVISIONS

4.2.7 Aerial Construction Photography

General Conditions Section 4 Subsections 4.2.7.1 & 4.2.7.2 are not applicable to this project.

4.2.8 Government Approvals and Permits

General Conditions Section 4 Subsection 4.2.8.1, City permit fees will be paid internally by the City and all other fees will be the responsibility of the Contractor.

Subletting of Agreement

Contractor must perform, with his own organization, work amounting to not less than 50 percent of the total Agreement cost.

Failure to submit Subcontractor's List Form, demonstrating self-performance not less than 50 percent of the total Agreement cost, will cause the bid to be deemed non-responsive.

Bidders should contact the Arizona Registrar of Contractors for information on license requirements.

EXHIBIT B

GENERAL CONDITIONS



GENERAL CONDITIONS

Approved date: July 20, 2022

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Appendix 2 – Cost Reduction Incentive Proposals for Design Bid Build Agreements

Appendix 3 – Contractor's Affidavit Regarding Settlement of Claims

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Appendix 5 – Forms of Payment Bond

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Appendix 8 – Construction Sign Detail

Appendix 9 – Cost of the Work (Applicable solely to Construction Manager at Risk and Job Order Contracting)

Appendix 10 Landscape Establishment Period

SECTION 1 - SCOPE OF THESE GENERAL CONDITIONS

These General Conditions encompass provisions that apply, and are incorporated into all construction Agreements entered into by the City of Chandler, unless otherwise specifically excluded in the executed Agreement.

SECTION 2 - GENERAL DEFINITIONS

Allowance: A specific amount for a specific item of Work, if any, that City agrees has not been sufficiently designed, detailed, or selected (including design changes from 90% to 100% as authorized by and at the discretion of the City) at the time the Agreement Price is agreed to for Contractor to provide a definitive price.

Alternate Systems Evaluations or Alternative Analysis: Alternatives for design, means and methods or other scope considerations that are evaluated using value analysis principles and have the potential to reduce construction costs while still delivering a quality and functional Project that meets City requirements.

Change Order: A written instrument issued after execution of the Agreement Documents signed by City and Contractor, 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 Agreement Price, the extent of the adjustment to the Agreement Time, or modifications of other agreement terms. The Agreement Price and the Agreement Time may be changed only by Change Order.

Consultant: Person or firm that provides professional services.

City (Owner or OWNER): City of Chandler, a municipal corporation, with whom Contractor has entered into the Agreement and for whom the Work or Services are to be provided pursuant to the Agreement(s).

Contingent Bid Items: This is a minor bid item which is likely, but not certain, to occur during the course of work. If the Engineer determines that this work is required, the Contractor will accomplish the work and payment will be made based on the contingent unit bid price included in the proposal. Since the quantity listed in the proposal is primarily for bid comparison, the amount of work required by the Engineer may vary materially from this.

Agreement: The written agreement executed between City and Contractor, including all of the Agreement Documents.

Agreement Documents: The documents which together form the Agreement between City and Contractor, as identified in Article 2 of the Agreement, or are otherwise incorporated into the Agreement, including the Agreement, the exhibits thereto, these General Conditions, any Notice to Proceed, and any Job Order (if applicable), the Plans and Specifications, Project Schedule, written and properly executed Change Orders, MAG Specifications and City's amendments thereto, and any other documents so designated in the Agreement.

Agreement Price: The agreed-upon price to be paid to Contractor for full, timely, and acceptable completion of the Work or Services under the terms of the Agreement.

Agreement Time(s): The number of calendar days or the dates related to the applicable phase, Substantial Completion, or Final Acceptance as stated in Agreement Documents. Agreement Time starts

General Conditions

with the Notice to Proceed (NTP) and ends with Final Acceptance. The Agreement Time is set forth in the Agreement and is based upon the Project Schedule agreed to by City in writing.

Contractor: The person or business association with whom City has entered into an agreement for construction related Work or Services in relation to the Project at issue.

Contractor Payment Request: The form that is accepted by City and used by Contractor in requesting progress payments or final payment and which must include such supporting documentation as is required by the Agreement Documents or City.

Construction Budget: The City's budget for construction of the Project.

Construction Documents: The Plans, Specifications, and Drawings prepared and issued by the Design Professional and approved by City for construction, meaning the documents are sealed by the Design Professional (as required), acceptable for permitting and incorporated into the Agreement by this reference. All amendments and modifications to the Construction Documents must be approved in writing by City prior to incorporation into the Agreement.

Cost of the Work: The term Cost of the Work will mean costs necessarily incurred by Contractor in the proper performance of the Work. Such costs will be at rates not higher than the standard paid at the place of the Project except with prior consent of City.

Critical Path Method (CPM): A scheduling technique which identifies the logical sequence of the activities occurring in a Construction Project, the anticipated time required to complete each activity in the Project, and the activities that must be completed on schedule to finish the Project within the anticipated time. Typically, activities are arranged in a network that shows both activities and their dependencies. CPM is also used as a management technique which enables contracting parties to predict when activities may occur so that resources can be effectively used and limitations can be identified.

Critical Path: Critical Path is the sequence of project network activities which add up to the longest overall duration. Once established in the Project Schedule, the Critical Path for the Project must not be changed without prior written approval of City.

Day: Calendar day(s) unless otherwise specifically stated in the Agreement Documents.

Design Professional: The qualified, licensed person, firm or corporation who furnishes design and construction administration services required under the Agreement Documents. These services may include, but are not limited to: development of Construction Drawings and Documents, review of Contractor Submittal(s), review of and response to Requests for Information, approval and certification of progress payment applications, construction administration, and construction agreement close out.

Differing Site Conditions: Concealed or latent physical conditions or subsurface conditions at the Site that, (i) materially differ from the conditions indicated in the Agreement Documents, or (ii) are of an unusual nature, differing materially from the conditions ordinarily encountered and generally recognized as inherent in the Work at the general area of the Site. Caliche, rock, hard-digging or sandy/silty soil encountered on a project is not considered a "Differing Site Condition."

Drawings (Plans): Documents, which visually represent the scope, extent and character of the Work to be furnished and performed by Contractor during the construction phase and which have been prepared

General Conditions

or approved by the Design Professional and City. These documents include Drawings that have reached a sufficient state of completion and released by Design Professional solely for the purposes of review and use in performing constructability or bid-ability reviews by Contractor and in preparing cost estimates (e.g. Master Planning and Programming, Schematic Design, Design Development, and Construction Drawings), but *"not for construction."* Shop Drawings are not Drawings as so defined.

Final Acceptance: The City's acceptance of the facility or project from the Contractor after all Work is completed, tested, and inspected in accordance with the Agreement requirements. Final Acceptance results in a Letter of Acceptance (LOA).

Fixed Price: A fixed price or amount for an Agreement Price, Scope of Work, materials, or other item under an Agreement, Change Order, or other agreement, which City agrees, in writing, to pay instead of the actual cost.

Float: The number of Days by which an activity can be delayed without lengthening the Critical Path and extending the Agreement Time. Unless otherwise expressly agreed in writing, all Float belongs to City.

Laws, Regulations, or Legal Requirements: Any and all applicable laws, rules, regulations, ordinances, codes and orders applicable to the Project of any and all governmental bodies, agencies, authorities and courts having jurisdiction and any applicable provisions of the Development Agreement for the Project (if any), including, without limitation, those provisions relating to the design and construction of the Project.

Line Item: The individual elements of Work identified on a bid or other schedule and associated with a price or a unit price and quantity particular to that individual element of the Work. Also refers to individual items of work within the Schedule of Values.

Liquidated Damages: Designated damages for the City to collect as compensation upon a specific breach (example: late delivery).

Long-Lead Item: Long-lead item refers to the equipment, product, or system that is identified at the earliest stage of a project to have a delivery time long enough to affect directly the Critical Path/the overall lead time of the project.

MAG: The Maricopa Association of Governments.

MAG Specifications: The most current version of the Uniform Standard Specifications for Public Works Construction published by MAG.

MAG Standard Details: The most current version of the Uniform Standard Details as published by MAG.

Minor change: A change in the Work having no impact on cost or time or the City-approved design intent, as determined by City.

Notice to Proceed (NTP): A written notice given by City to Contractor fixing the date on which Contractor will start to perform Contractor's obligations under the Agreement.

Project: The Project specified in the Agreement (including a Job Order).

Project Manager: The Project Manager designated in Article 1 of the Agreement, or any successor thereto

General Conditions

designated by City. The Project Manager has the authority to act on behalf of City, as delineated and limited by the Agreement Documents and applicable law. And City will communicate with Contractor through the Project Manager. However, the Project Manager has no authority to bind City or City Council in contravention of any City code, State or Federal statute or regulation, or these General Conditions.

Project Schedule: The schedule for the completion of the Project agreed to and required by City.

Project Specific Conditions: Additional conditions which apply to the specific Project and Scope of Work which are set forth in Exhibit D of the Agreement.

Project Team: The Project Team consisting of the Design Professional, Contractor, Project Manager, and such others as City may designate.

Punch List: The list initially prepared by Contractor pursuant to the Agreement Documents, reviewed and supplemented by the Project Manager (and at the sole option of the Project Manager, the Design Professional) and approved by City containing items of incomplete work not impacting Substantial Completion, if allowed for under the Agreement, and to be completed or corrected by Contractor after Substantial Completion and before Final Acceptance in accordance with the Agreement Documents.

Quality Assurance (QA) Testing: Testing performed to verify the accuracy and applicability of the QC testing results and to ascertain that the materials installed meet the specified levels of quality in accordance with the Agreement Documents.

Quality Control (QC) Testing: Testing performed to assure that the materials installed comply with the requirements in the Agreement Documents.

Requests for Information (RFIs): Formal written request from Contractor to City or Design Professional for the Project seeking clarification or additional information needed for Contractor to properly complete the Work or Services under the Agreement. City may require RFI's to be submitted on a specific form or in a specified format.

Schedule of Values (SOV): The specified document prepared by Contractor, and approved and accepted by City, which divides the Agreement Price into pay items, such that the sum of all pay items equals the Agreement Price for the construction phase Work, or for any portion of the Work having a separate specified Agreement Price.

Scope of Work: The scope of work agreed to or required by City and incorporated into the Agreement as Exhibit A.

Shop Drawings: All drawings, diagrams, schedules and other data specifically prepared for the Work by Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

Site: The land or premises on which the Project is located.

Specifications: The part(s) of the Agreement 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. Where specified, the Project must be constructed using the current Uniform Standard Specifications and Details for Public Works

Construction as furnished by the Maricopa Association of Governments, as amended by City.

Subconsultant: A person, firm or corporation having an Agreement with Consultant/Contractor 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 Contractor or any other individual or firm having an Agreement with the aforesaid contractors at any tier, who undertakes to perform a part of pre-construction services or construction phase Work at the Site for which Contractor is responsible. Subcontractors must be selected through the Subcontractor selection process described in the Agreement Documents, if any.

Substantial Completion: The date when the City determines that the Work (or separable units of Phases as provided in the Agreement Documents) is essentially and satisfactorily complete in accordance with the Agreement Documents such that the Project is ready for use by the City for its intended purpose, opening to the general public, full occupancy or use by City (including, without limitation, all separate units, or rooms, facilities, access, income-generating areas, and all areas serving the general public, as applicable, must be ready for full operation without material inconvenience or discomfort), including, to the extent applicable to the Work, the following: all materials, equipment, systems, controls, features, facilities, accessories, and similar elements are installed in the proper manner and in operating condition, inspected, and approved; surfaces have been painted; masonry and concrete cleaned with any sealer or other finish applied; utilities and systems connected and functioning; site work complete; permanent heating, ventilation, air conditioning, vertical transportation, and other systems properly operating with proper controls; lighting and electrical systems installed, operable and controlled; paving completed, signage installed, and other work as applicable, has been performed to a similar state of essential and satisfactory completion.

Supplier: A manufacturer, fabricator, distributor, or vendor having a direct Agreement with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the construction phase Work by Contractor or any Subcontractor.

Total Float: Number of Days by which pre-construction services or construction phase Work or any part of the same may be delayed without necessarily extending a pertinent Agreement Time or schedule milestone in the Project Schedule.

Work: The entire completion of 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 Agreement Documents for the construction phase.

Writing: Typing, printing, photography and other modes of representing or reproducing words in a visible form, including email, and expressions.

SECTION 3 - STANDARD SPECIFICATIONS AND DETAILS

- 3.1 City operates under the latest revision of the MAG Specifications and MAG Standard Details as amended by City. City's current amendment to the MAG Specifications, part of the City's Unified Development Manual, may be found and downloaded from City's website at <http://www.chandleraz.gov>.

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- 3.2 Copies of the MAG Specifications and MAG Standard Details are available at the Maricopa Association of Governments office, 302 N. 1st Avenue, Suite 300, Phoenix, Arizona. They may also be downloaded from their website at: <http://www.azmag.gov/Newsroom/Publications>
- 3.3 The MAG Specifications and Standard Details and City's amendments thereto are incorporated into the Agreement by this reference.

SECTION 4 - CONTRACTOR'S RESPONSIBILITIES FOR CONSTRUCTION SERVICES**4.1 GENERAL**

- 4.1.1 Contractor must construct the Work in accordance with the Agreement Documents and as outlined in Exhibit A of the Agreement to the satisfaction of City, exercising the degree of professional care, skill, diligence, quality and judgment that a professional construction manager engaged, experienced and specializing in the construction management of construction and facilities of similar scope, function, size, quality, complexity and detail in urban areas throughout the United States comparable to Chandler, Arizona would exercise at such time, under similar conditions. Contractor must, at all times, perform the Work in conformance with sound and generally accepted engineering principles and construction management and construction contracting practices.
- 4.1.2 If Contractor observes errors, discrepancies or omissions in the Agreement Documents, Contractor must promptly notify the Design Professional and City and request clarification. If Contractor, with the exercise of reasonable care, should have recognized such error, inconsistency, omission, or difference and fails to report it to City, and if Contractor proceeds with the Work affected by such observed errors, discrepancies or omissions, without receiving such clarifications, Contractor does so at its own risk and will be liable to City for damages resulting from proceeding without clarification.
- 4.1.3 Project Team and agents of each of them, testing agencies and governmental agencies with jurisdictional interests will be provided access to the Work at reasonable times for their observation, inspection, and testing. Contractor must provide proper and safe conditions for such access.
- 4.1.4 Contractor must comply with, and require all Subcontractors to comply with, the Arizona Contractors' license laws, including all requirements with respect to being duly registered and licensed.
- 4.1.5 Contractor must ensure that all employees performing any Work for which Contractor is responsible have a legal right to live and work in the United States. In addition, all compensation of any such employee must meet all applicable requirements of the Fair Labor Standards Act (FLSA) and Federal Minimum Wage laws.
- 4.1.6 Contractor must comply with the Immigration Reform and Control Act of 1986 (IRCA). Contractor understands and acknowledges the applicability of the IRCA activities. Contractor agrees to comply with the IRCA while performing their work and to permit City inspection of Contractor personnel records to verify such compliance.
- 4.1.7 Pursuant to MAG Specifications §§ 107.4, Contractor must report immediately any discovery of archeological ruins or artifacts. Excavation must stop immediately so that City can decide on the pertinent steps to follow such discovery.

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- 4.1.8 All property owners that may be affected by the proposed construction activities must be notified of the scope, duration of the construction activities and possible interference with their day-to-day activities by Contractor prior to start of construction. In addition, individual residential or commercial interferences, such as driveway restrictions, water outages, and all other Work adjacent to residence/business, require 48-hour notification in advance of specific adjoining Work. Notification may be through door hangers or other procedures approved by the City.
- 4.1.9 Access must be maintained to adjacent properties at all times during construction. Where property has more than one point of access, no more than one access will be restricted or closed at any one time. Access to adjacent private driveways will be maintained during all non-working hours.
- 4.1.10 Contractor must furnish and erect construction signs in accordance with Project Specifications. The signs must be professionally prepared and subject to approval by City, must be maintained by Contractor for the duration of the project, and must be removed by Contractor during the final project clean up.
- 4.1.11 The number of signs required, the size, shape, installation requirements and information to be included for construction signs is established on the detail sheet, provided, however, signs must be a minimum of 4 foot by 8 foot and must be installed so that the bottom of the sign is at least 4 foot above grade. No direct payment will be made for furnishing and erecting construction signs. The cost thereof must be included in other items for which direct payment is made. Sign locations will be determined by City.
- 4.1.12 All required construction signs must be installed by Contractor within 7 Days of Notice to Proceed.
- 4.1.13 The Work to be accomplished under these Agreement Documents has been designed for City by a Design Professional retained by City for this purpose. It is understood that normal construction Administration for the purpose of interpretation of the Agreement Documents is provided by City. Should any services of the Design Professional be required to assist in the corrections of errors or omissions by Contractor, or services of the Design Professional be required because of changes in structure or equipment where Contractor has requested approval of substitute methods or material, or any other items detailed herein below, those services will be provided by the Design Professional at the standard hourly rates previously negotiated with City and must be paid for by the Contractor.
- 4.1.14 Contractor must reimburse City for costs incurred by the Design Professional for additional services to the Project through no fault of City or the Design Professional including, but not limited to, the following conditions:
- a. Additional Site visits, investigations, inspections, design work or reports by the Design Professional which are required due to damages to existing facilities or completed Work caused by the Contractor in his performance, Contractor's negligence, or Contractor's Work which is rejected as defective or as failing to conform to the Agreement Documents;
 - b. Design Professional construction phase services rendered on the project during the time the project remains incomplete after the Agreement date of final completion will be charged to Contractor at a rate previously negotiated City; and

- c. All retesting required due to the failure of Contractor's Work to meet the requirements of the Agreement Documents will be at Contractor's expense. All standby and travel time by the City's testing lab, the Design Professional or City due to Contractor's inability to be prepared for testing at the agreed upon time will be at the Contractor's expense.

4.1.15 City may withhold from any payment otherwise due to Contractor any amounts necessary to pay the Design Professional for such additional services as provided herein above.

4.1.16 Contractor will not be required to bear additional costs incurred by City due to errors by the Design Professional.

4.2 **CONTRACTOR'S PRE-AGREEMENT AND PRE-WORK DELIVERABLES**

4.2.1 Prior to award of the Agreement, Contractor must execute Agreement and deliver to City. Failure to do so may delay Agreement award. Contractor must also provide to City its Contractor's License classification and number and its Federal Tax I.D. number.

4.2.2 Before beginning any Work under the Agreement, Agreement must be fully executed by City.

4.2.3 After Agreement award, City will issue to Contractor an award letter. At that time Contractor must deliver to City such bonds and certificates of insurance with endorsements in such amounts (and other evidence of insurance requested by City) required under Section 11 of these General Conditions, and as the Agreement requires.

4.2.4 As evidence of Workmen's Compensation Insurance, Contractor must, upon request, provide a letter of certification from the Industrial Commission of Arizona that Contractor is insured by the State Compensation Fund or is an authorized self-insurer or a certificate of insurance issued by an insurance company authorized by the Insurance Department of Arizona to write Workmen's Compensation and Occupational Disease Insurance in the State of Arizona.

4.2.5 Within 10 Days of the date of the executed Agreement letter issued by City, Contractor must submit to City for review and acceptance the following items:

4.2.5.1 Comprehensive construction Project Schedule including a Critical Path Method (CPM) diagram schedule as described in Section 6.2. Project Schedule must be in Microsoft Project standard file format. Within 10 Days of receipt of City's comments, Contractor must make all required corrections, adjustments, and additions to complete the Project Schedule and resubmit to City for review.

4.2.5.2 Preliminary schedule of submittals and Shop Drawings. Within 10 Days of receipt of City's comments, Contractor must submit the corrected and completed schedule of Shop Drawings submissions for approval. Contractor's schedule of Shop Drawings and sample submittals will be acceptable to City if it provides a workable arrangement for reviewing and processing the required submittals.

4.2.5.3 Schedule of Values in a form specified by City reflecting the subcontracts and other categories that will be used to submit Pay Applications for the Work. The total amount of the Schedule of Values must not be greater than the Agreement Price. The Schedule of Values will be reviewed at the Pre-Construction Conference and revised by Contractor within 10 Days after Pre-Construction Conference in response to comments and questions from

City. Once accepted by City in writing, the Schedule of Values for the Project must not be changed without the prior written approval of City.

4.2.6 Video Recording Requirement. Prior to performing any Work, Contractor must document the existing conditions of the Site, all other areas where Work will occur and all adjacent areas that may be impacted by the Work via digital video format. Contractor must video record and index all areas, features, buildings and other public and private improvements that could potentially be impacted by the Work. Video recording must be coordinated with City. When video recording private property, Contractor must also coordinate the video recording with the private property owner, if possible. Contractor must provide City with a copy of said digital video format prior to performing any Work.

4.2.7 Aerial Drone Construction Photography.

4.2.7.1 If Agreement duration is greater than 90 calendar days, Contractor must engage a professional unmanned aerial vehicle (UAV) aerial pilot to photograph the Site prior to construction mobilization, at three-month intervals during construction, and following final inspection. Drone camera specifications must meet the following minimum requirements:

- a. 1-inch CMOS
- b. Pixels: 20M
- c. FOV 84 8.8 mm/24 mm (35 mm format equivalent) f/2.8-f/11 auto focus at 1 m-
- d. For photographing: 16.9 Aspect Ratio: 5472x3078
- e. For video shooting: MP4/MOV/H.264
- f. FHD: 1920x1080 120p @100Mbps
- g. File format: High Definition (HD) JPEG for digital photos and HD MPEG 4 for digital video.
- h. All metadata to be recorded including GPS data and preserved with photographs provided.

Interval	JPEG
3 month intervals	At an altitude (AGL) between 70-90 ft.
3 month intervals	Images to be taken every 50-100 ft. to be determined based on project scope.

4.2.7.2 Drone photos to be taken in sequential geographical order and then organized and provided in the same manner unless otherwise specified.

4.2.7.3 Photos to be provided digitally via an online file share service and/or by a USB drive to contractor.

4.2.7.4 Drone pilots to obey ALL local (city, county, state) UAV regulations as well as FAA UAV guidelines including, but not limited to, conducting all flights during daylight hours, not exceeding maximum altitude ceilings (depending on area), not flying over people, yielding to other aircraft.

4.2.7.5 Drone pilots must fly drone within visual line of sight (VSOL) and have visual spotter when needed. Drone pilots only to operate in favorable weather conditions when minimum visibility is 3 miles or greater.

4.2.7.6 Drone pilots to conduct a preflight checklist and visually inspect the entire flight path prior to flying to ensure a safe flight.

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- 4.2.7.7 **Airspace Authorizations.** Operations in Class G airspace are allowed without air traffic control (ATC) permission. Operations in Class B, C, D and E airspace need ATC authorization. Drone pilots to schedule each flight in advance and based on airspace if required will notify nearby airports/control towers, etc.
- 4.2.8 **Government Approvals and Permits.**
- 4.2.8.1 Contractor must obtain all necessary permits for the Work and pay all applicable fees, unless otherwise noted on the Plans and in the Specifications. City permit fees will be paid internally by City. For bidding purposes, an allowance for all permit fees is included in the bid schedule under the item "allowance for permit fees." The Contractor will be paid for the actual cost of the permit fees upon submitting a receipt showing the fee Contractor has paid. Excluded from the above allowance are items such as all costs incurred by the Contractor in securing the permit except for the actual permit fee established by the agency, cost for all shutdowns or outages, cost for pole bracing, cost of permits for construction water, cost of construction water, cost for any additional insurance requirements, cost for any licenses, and other similar type costs. Contractor is specifically notified of the need to obtain the necessary environmental permits or file the necessary environmental and regulatory permit notices.
- 4.2.8.2 Copies of all permits and the associated notices must be provided to City prior to starting the permitted activity.
- 4.3 **PRE-CONSTRUCTION CONFERENCE**
- 4.3.1 Prior to the commencement of any Work, City will schedule a Pre-Construction Conference.
- 4.3.2 The purpose of this Conference is to establish a working relationship between Contractor, the utility firms, and various City agencies. The agenda will include critical elements of the Work schedule, submittal schedule, cost breakdown of major lump sum items, Payment Requests and processing, coordination with the involved utility firms, and emergency telephone numbers for all representatives involved in the course of construction.
- 4.3.3 Minimum attendance by Contractor at any mandatory meeting with City must be (1) Contractor's Representative, who is authorized to execute and sign documents on behalf of the firm, (2) Contractor's on-site Superintendent, and (3) Contractor's Safety Office, or other employee responsible for safety.
- 4.4 **PERFORMANCE OF THE WORK (INCLUDING FIELD MEASUREMENTS, SUBCONTRACTORS, AND SUPPLIERS)**
- 4.4.1 Unless otherwise provided in the Agreement Documents to be the responsibility of City or a separate Contractor, Contractor must provide through itself or Subcontractors the necessary supervision, labor, inspection, testing, start-up, material, equipment, machinery, temporary utilities and other temporary facilities to permit Contractor to complete the Work consistent with the Agreement Documents.
- 4.4.2 Contractor must perform all construction activities efficiently and with the requisite expertise, skill and competence to satisfy the requirements of the Agreement Documents. Contractor must at all times exercise complete and exclusive control over the means, methods, safety, sequences and techniques of construction.
- 4.4.3 Contractor's Superintendent must be present at the Site at all times that material Work

under this Agreement is taking place. Contractor's Superintendent or designee must be present at the Site at all times any other Work under this Agreement is taking place. Superintendent must not be replaced without written notice to City. Whenever the Superintendent is not present at a particular part of the Work where the City or Design Professional may desire to inform the Contractor relative to interpretation of the Drawings and Specifications or to disapproval or rejection of materials or Work performed, the City or Design Professional may provide such information in writing to the foreman or other worker in charge of the particular part of the Work in reference to which the information is given. Information so given will be as binding as if given to the Superintendent.

- 4.4.4 All elements of the Work must be under the direct supervision of a foreman or his designated representative on the Site who must have the authority to take actions required to properly carry out that particular element of the Work.
- 4.4.5 Working Hours. Except in connection with the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise indicated, all Work at the Site must be performed during regular working hours, and Contractor will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without City's written consent given after prior written notice to City. If it will become absolutely necessary to perform Work at night or on Saturdays, Sundays or legal holidays, the City must be informed at least 24 hours in advance of the beginning of performance of such Work. Only such Work will be done at night as can be done satisfactorily as determined by the City. Good lighting and all other necessary facilities for carrying out and inspecting the Work must be provided and maintained at all points where such Work is being done. Further, unless such non-normal work hours are performed at City's request or required by the Agreement Documents, Contractor must pay to City all additional costs incurred by City by reason of such non-normal working hours. Expenses incurred by City for overtime compensation must be reimbursed by Contractor as follows: (i) City staff at the rate set forth in current City Fee Schedule as published on City website, (ii) Design Professional and staff at the standard hourly rates previously negotiated with City, and (iii) all others at actual cost plus ten percent administrative overhead. Such costs may be deducted by City from any payments due to Contractor. Provided, however, if overtime work or work during other than normal hours is at the request of City and not due to Contractor delay, City will pay the cost of City overtime expenses.
- 4.4.6 Where the Agreement Documents require that a particular product be installed or applied by an applicator approved by the manufacturer, it is Contractor's responsibility to ensure the Subcontractor employed for such work is approved by the manufacturer. All materials and equipment must be stored, applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturer, fabricator, supplier or distributor, except as otherwise provided in the Agreement Documents; but no provisions of any such instructions will be effective to impose on City or Design Professional responsibility for the means, methods, techniques, sequences or procedures of construction or for safety precautions incident thereto.
- 4.4.7 Before starting the Work, Contractor must carefully study and compare the various Plans, Drawings, other Agreement Documents, and Specifications relative to that portion of the Work, as well as the information furnished by City, must take field measurements of any existing conditions related to that portion of the Work and must observe any conditions at the Site affecting it. The exactness of grades, elevations, dimensions, or locations given on any Drawings, or the Work installed by other contractors, is not guaranteed by City.

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- 4.4.8 Before ordering materials or doing Work, Contractor and each Subcontractor must verify measurements at the Site and will be responsible for the correctness of such measurements. No extra charge or compensation will be allowed because of differences between actual dimensions and the dimensions indicated on the Agreement Documents, including the Drawings.
- 4.4.9 Ground Level Construction Photography.
- 4.4.9.1 The Contractor must furnish progress photographs of the project. The photographer selected by the Contractor must be approved by the City and must be either a commercial photographer or an individual experienced and equipped for such photography.
- 4.4.9.2 The Contractor must deliver to City all photographs taken during that period with each application for payment. If the current photographs do not accompany the application, the application will not be reviewed and will be returned to the Contractor as incomplete.
- 4.4.9.3 Photographs must be identified by use of typewritten labels affixed to the back of the photograph. The label must provide a description of the view, the direction from which the photograph was taken, the name of the project, City's project number, the name of Contractor and the date of the photography. The stationing must also be included for all pipeline installations.
- 4.4.9.4 Photographs must be taken during the construction period and must be of aesthetic composition and depict the progress of the Work from the beginning of construction through and including the finished product. City may vary the specified frequency so that significant progress or changes can be recorded on the photographs.
- 4.4.10 Underground Facilities.
- 4.4.10.1 The existence and number of facilities as shown on the Plans are estimated from information furnished by the particular utility. Contractor is responsible for field verification and location of all utilities prior to the start of construction. No field work will be allowed to start until Contractor has contacted Arizona 811 and all affected utilities have been located. In addition, Contractor must expose and physically locate all potentially conflicting utilities prior to construction. The actual locations of the utilities must be compared to locations shown on the Plans and any required changes in alignment and grade must be made at the time of construction in consultation with Project Manager. It is generally recognized and Contractor should anticipate that information from Arizona 811 or information from utility companies during project design, frequently fails to disclose all underground facilities. The fact that more utility lines or other underground facilities are located in the Project Site than shown on the Project Plans does not constitute an "unforeseen Condition" and such undisclosed underground facilities do not differ materially from the conditions which Contractor should expect. The provisions of Sections 105.4, 105.6, 107.11 and 109.8.1 of the MAG Uniform Standard Specifications for Public Works Construction apply and are incorporated herein by this reference.
- 4.4.10.2 Contractor is responsible for all coordination with utility companies. The provisions of Sections 105.4, 105.6, 107.11 and 109.8.1 of the MAG Uniform Standard Specifications for Public Works Construction strictly apply and no additional compensation will be paid to Contractor for delays due to utility work on the project.
- 4.4.11 Relocation of Existing Water Meters. When a service line has been extended and a line

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setter installed in a meter box, City forces will re-install meter. No compression fittings will be utilized.

4.4.12 Water Turn-On or Turn-Off.

4.4.12.1 Contractor must coordinate all water line turn-ons and turn-offs through the City. Application must be made to the Municipal Utility Division and Contractor must pay the established charges. The City will close existing valves, but will not guarantee a bone-dry Shutdown.

4.4.12.2 Contractor must notify all customers affected by the turn-off not less than 48 hours in advance. Notification must be in writing, must give the reason for the turn-off and must give the estimated time and duration that water service will be interrupted. Contractor is also notified that water turn-off will not be permitted on the Day before and after Thanksgiving Day and Christmas Day.

4.4.12.3 No direct payment will be made to Contractor for turn-ons or turn-offs. Costs associated therewith will be included in other items for which direct payment is made.

4.4.13 Tests and Inspections.

4.4.13.1 Contractor must give City timely (at a minimum, twenty-four hours) notice of readiness of the Work for all required inspections, tests or approvals. Contractor must give timely notice to City in advance of backfilling or otherwise covering any part of the Work so that city representative may, if desired, observe such part of the Work before it is concealed. Whenever Contractor varies the normal period during which Work or any portion of it is carried on each Day, Contractor must give timely notice to City so that city representative may, if desired, be present to observe the Work in progress. If Contractor fails to give such timely notice, any Work done in the absence of city representative will be subject to rejection. If Contractor gives such notice to City, but then is not ready for such inspections, tests, approvals or observations at the time so noticed, Contractor must reimburse City for all costs incurred by the attendance of city representatives.

4.4.13.2 If any law, ordinance, rule, regulation, code, or orders of any public body having jurisdiction requires any Work (or part thereof) to be inspected, tested or approved, Contractor (unless another party is specified in the Agreement Documents) must assume full responsibility therefor, pay all costs in connection therewith and furnish City the required certificates of inspection, testing, or approval. Contractor must also be responsible for and must pay all costs in connection with any inspection or testing required by the Specifications in connection with City's acceptance of a manufacturer, fabricator, supplier or distributor of materials or equipment proposed to be incorporated in the Work, or of materials or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. The cost of all other inspections, tests and approvals required by the Agreement Documents will be paid by City (unless otherwise specified).

4.4.13.3 All inspections, tests or approvals other than those required by law, ordinance, rule, regulation, code or order of any public body having jurisdiction must be performed by organizations acceptable to City and by the Design Professional if so specified.

4.4.13.4 Neither observations by City, the Design Professional nor inspections, tests or approvals by others will relieve Contractor from their obligations to perform the Work in accordance with the Agreement Documents.

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- 4.4.14 Uncovering Work. If any Work that is to be observed, inspected, tested or approved is covered without written concurrence of City, it must, if requested by City be uncovered for observation. Unless Contractor has given City timely notice of Contractor's intention to cover such Work and City has not acted with reasonable promptness in response to such notice, Contractor must furnish all necessary labor, material and bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, including compensation for additional professional services, and an appropriate deductive Change Order will be issued.
- 4.4.15 In all cases of interconnection of its Work with existing or other Work, Contractor must verify at the Site all dimensions relating to such existing or other Work. Any errors due to Contractor's failure to so verify all such grades, elevations, locations or dimensions must be promptly rectified by Contractor without any increase in the Agreement Price. Any design errors or omissions noted by Contractor during this review must be reported promptly to City.
- 4.4.16 Contractor must establish and maintain all construction grades, lines, levels, and benchmarks, and will be responsible for accuracy and protection of same. This Work must be performed or supervised by a licensed civil engineer or surveyor in the State of Arizona.
- 4.4.17 Contractor must photograph all buried piping of greater than four (4) inches in diameter prior to backfill.
- 4.4.18 Contractor is responsible for the proper performance of the work of Subcontractors and any acts and omissions in connection with such performance. Nothing in the Agreement Documents is intended or deemed to create any legal or contractual relationship between City and any Subcontractor or Sub-Subcontractor, including but not limited to any third-party beneficiary rights.
- 4.4.19 Contractor must coordinate the activities of all Subcontractors. Contractor must coordinate performance of the Work with City's Public Works & Utilities Department and other departments or agencies within City. The Design Professional and other contractors or parties involved in the Project. If City performs other work on the Project or at the Site with separate contractors under City's control, Contractor agrees to cooperate and coordinate its activities with those of such separate contractors so that the Project can be completed in an orderly and coordinated manner without unreasonable disruption.
- 4.4.20 Contractor will not substitute or change any Subcontractor or Supplier without the prior written approval of City. Any substitute or replacement Subcontractor or Supplier must be required to meet the same qualifications and selection criteria and process as the original Subcontractor or Supplier. If a Subcontract/Supplier selection plan has been approved by City, Contractor will follow that plan unless otherwise approved by City in writing.
- 4.4.21 Contractor must not change or replace any members of its Project team, including Contractor's Representative, Project Manager, or Superintendent, without an explanation for the change being given to City, and receiving prior written approval of the change from City, which approval will not be unreasonably withheld.
- 4.4.22 Subcontractors whose scope of work has a value greater than 15% of the total Agreement Price are required to furnish performance and payment bonds to Contractor, unless

otherwise approved in writing by City.

- 4.4.23 Contractor must comply with MAG Specification § 108.2 (E) unless otherwise specified in Agreement Documents.

4.5 **CONTROL OF THE PROJECT SITE**

- 4.5.1 Throughout all phases of construction, including suspension of Work, Contractor must keep the Site reasonably free from debris, trash and construction wastes to permit Contractor to perform its construction services efficiently, safely and without interfering with the use of adjacent land areas. Prior to Final Acceptance of the Work, or a portion of the Work, Contractor must remove all debris, trash, construction wastes, materials, equipment, machinery and tools arising from the Work or applicable portions thereof to permit City to occupy the Project or a portion of the Project for its intended use.
- 4.5.2 Contractor must take whatever steps, procedures or means necessary to prevent dust nuisance due to construction operations. The dust control measures must be maintained at all times to the satisfaction of City and in accordance with the requirements of the Maricopa County Bureau of Air Pollution Control Rules and Regulations.
- 4.5.3 Contractor must maintain Americans with Disabilities Act (ADA) and American National Standards Institute (ANSI) accessibility requirements during construction activities, including without limitation compliance with the 2010 regulations governing implementation of the ADA to the extent applicable. ADA and ANSI accessibility requirements must include, but not be limited to, parking, building access, areas of refuge, and emergency exit paths of travel. Contractor is responsible for the coordination of all Work to minimize disruption to residents and the public.
- 4.5.4 Only materials and equipment used directly in the Work will be brought to and stored on the Site by Contractor. When equipment is no longer required for Work, it must be removed promptly from the Site. Protection of construction materials and equipment stored at the Site from weather, theft, damage and all other adversity is solely the responsibility of the Contractor.
- 4.5.5 Contractor agrees all persons working on the Site must act at all times in the best interest of the Project and will comply with all applicable rules and regulations reasonably set forth by City related to the Site. Notwithstanding the foregoing or anything in this Agreement to the contrary, City may remove from the Site any individual who City deems in their reasonable discretion to be creating a disturbance or causing any problem on the Site.
- 4.5.6 Contractor will be responsible to City for the acts and omissions of Contractor's employees, Subcontractors and their agents and employees, and any other person performing any of the Work under an Agreement with Contractor, or claiming by, through or under Contractor, for all damages, losses, costs and expenses resulting from such acts or omissions.
- 4.5.7 City may conduct criminal, drive history, and all other requested background checks of Contractor and Subcontractor personnel performing Work or who have access to City's information, data, or facilities in accordance with City's current background check policies, or the provisions of the Project Specific Conditions. Any officer, employee or agent that fails to background check must be replaced immediately.
- 4.5.8 City will have a final authority, based upon security reasons: (i) to determine when

security clearance of Contractor's and Subcontractor's personnel is required; (ii) to determine the nature of the security clearance, up to and including fingerprinting personnel; and (iii) to determine whether or not any individual or entity may provide Services or perform Work under the Agreement.

- 4.5.9 If City objects to any personnel for any reasonable cause, then Contractor must, upon notice from City, remove such individual from the Project.

4.6 **PROJECT SAFETY**

- 4.6.1 The Project and all Work performed in relation thereto is governed by applicable provisions of the federal laws, including but not limited to, the latest amendments of the following:

- a. Williams-Steiger Occupational Safety & Health Act of 1970, Public Law, 91-596.
- b. Part 1910 and Part 1926 – Occupational Safety and Health Standards, Chapter XVII of Title 29, Code of Federal Regulations.
- c. Part 1518 – Safety and Health Regulations for Construction, Chapter XIII of Title 29, Code of Federal Regulations.

- 4.6.2 Contractor is responsible for safety of the job Site for employees of Contractor as well as for members of the general public and others who may drive or walk through or be at the Site.

- 4.6.3 Contractor recognizes the importance of performing the Work in a safe manner so as to prevent damage, injury or loss to: (i) all individuals at the Site, whether working or visiting; (ii) the Work, including materials and equipment incorporated into the Work and stored On-Site or Off-Site; and (iii) all other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction; and (iv) the owners or tenants of adjacent property and their patrons, employees and invitees.

- 4.6.4 Contractor assumes responsibility for implementing and monitoring all safety precautions and programs related to the performance of the Work.

- 4.6.5 Contractor must provide a "competent person" as required by O.S.H.A regulations. The "competent person" must be identified at the Pre-Construction Conference with City advised in writing of any changes.

- 4.6.6 The "competent person" must make routine daily inspections of the Site and must hold weekly safety meetings with Contractor's personnel, Subcontractors and others as applicable.

- 4.6.7 Contractor and Subcontractors must comply with all legal and regulatory requirements relating to safety, as well as any City specific safety requirements set forth in the Agreement Documents, provided that such City-specific requirements do not violate any applicable legal and regulatory requirements.

- 4.6.8 Contractor will immediately report in writing any safety-related injury, loss, damage or accident arising from the Work to Project Manager and, to the extent mandated by Legal Requirements, to all government or quasi-government authorities having jurisdiction over safety-related matters involving the Project or the Work.

- 4.6.9 Contractor's responsibility for safety under this Section is not intended in any way to relieve Subcontractors and Sub-Subcontractors of their own contractual and legal obligations and responsibility for (i) complying with all Legal Requirements, including those related to health and safety matters, and (ii) taking all necessary measures to implement and monitor all safety precautions and programs to guard against injury, losses, damages or accidents resulting from their performance of the Work.
- 4.6.10 As between City and Contractor, Contractor is responsible to City for any and all the safety issues relating to the Work on the Project. Contractor must administer and manage the safety program. This will include, but not necessarily be limited to review of the safety programs of each Subcontractor. Contractor must monitor the establishment and execution of compliance with all applicable regulatory and advisory agency construction safety standards. Contractor's responsibility for review, monitoring, and coordination of the Subcontractor's safety programs will not extend to direct control over execution of the Subcontractors' safety programs. Notwithstanding Contractor's safety obligations to City, it is agreed and understood that each individual Subcontractor will remain controlling employer responsible for the safety programs and precautions applicable to its own work and the activities of other's work in areas designated to be controlled by such Subcontractor for purposes of workers compensation insurance coverage.
- 4.6.11 Nothing in this agreement will relieve Contractor of his responsibility to maintain traffic, structures, etc., as noted on the Plans, Specifications, and Project Specific Conditions. Contractor is responsible to provide all necessary shoring, bracing and trench support as is necessary to maintain traffic structures, etc., as stipulated in the Plans, Specifications, and Special Provisions. If the stability of adjoining building, walls, roadways, etc., is endangered by Contractor's excavation, shoring, bracing, or under pinning must be provided as necessary to ensure project safety. Cost for shoring, bracing, underpinning, and trench support will be included in the appropriate items listed in the Agreement Price, and no additional payment will be made for this work.
- 4.7 **MATERIALS QUALITY, SUBSTITUTIONS, AND SHOP DRAWINGS**
- 4.7.1 **Quality Control and Quality Assurance Testing.**
- 4.7.1.1 All construction materials to be used or incorporated in the Project are subject to inspection, Quality Control & Quality Assurance Testing, and approval or rejection by City. Any material rejected by City must be removed immediately and replaced in an acceptable manner to City at no additional cost to City. When QC/QA tests indicate noncompliance with the Agreement Documents, retesting must be performed by the same testing laboratory that performed the tests that indicated noncompliance.
- 4.7.1.2 The Contractor must establish, provide, and maintain an effective Quality Control Testing Program (QCTP). The Contractor must develop his own program or procure the services of a consultant. In either case, the party performing the tests must be currently certified by the National Bureau of Standards in the National Voluntary Laboratory Accreditation Program (NVLAP) for construction services or the AASHTO Accreditation Plan (AAP) for Soils, Asphalt and Concrete. The Contractor must provide all support necessary to perform QC and QA testing and sampling (i.e. shoring for testing trench backfill, backhoes, motor graders, loaders, etc. to facilitate testing and sampling). The City will perform the QA testing.
- 4.7.1.3 The Contractor must submit a written QCTP to the City as a required submittal. The Contractor must not begin Work until the Quality Control Program has been reviewed and

- accepted by the City. Resumes of all personnel that will be associated directly or indirectly with the QCTP must be included.
- 4.7.1.4 The QCTP must include, but not be limited to, on-site/field and laboratory testing of all material delivered to the Site and any existing materials or conditions pertinent to the project.
- 4.7.1.5 All testing must be under the direction of a Professional Engineer registered in the State of Arizona, knowledgeable in Materials Testing. All "Test Report" forms must be stamped by said Engineer.
- 4.7.1.6 The written QCTP will set forth the responsibilities of the engineer, project manager, supervisory personnel and each technician assigned to this project. Substitutions or replacement of personnel must require prior written approval by the City. All personnel must be proficient within their assigned duties and possess certification(s) commensurate with their position and responsibilities. The minimum certification(s) for each technician must be NICET Level II, Arizona Technical Testing Institute, American Concrete Institute, or other nationally recognized program applicable to the project and approved by the City of Chandler. The written QCTP must include a description of the required field and construction materials laboratory tests, including required frequencies that meet the minimums established herein.
- 4.7.1.7 The Contractor must establish a system to record and report all material test results. The daily test reports must include, but not be limited to:
- a. Test designation;
 - b. Date of test;
 - c. Name of tester;
 - d. Location of test/sample (station and offset);
 - e. Product suppliers and product codes (as applicable);
 - f. Depth/elevation of test/sample;
 - g. Test result;
 - h. Control requirement(s);
 - i. Cause of rejection (if applicable);
 - j. Results of retests (if applicable); and
 - k. Remedial action (if applicable).
- 4.7.1.8 The Contractor must submit test results to the designated City representative.
- 4.7.1.9 The Contractor must also submit a weekly report to the City summarizing the testing and construction activities completed by emailing the report to the email addresses noted above. All weekly reports must be submitted simultaneously to the Contractor and the City of Chandler. The report must include individual summary sheets for each utility line, structure, and portion of the pavement section. Cores must be numbered sequentially throughout the Project. Re-cores must reference the original core by number and must contain the averaged values for thickness and density. Total pavement thickness must be reported. Vertical location of tests for underground utilities must indicate the depth of the

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excavation at the location of the test (i.e., cut to flow line [if applicable], depth to bottom or top of pipe, etc.). Density tests must be numbered sequentially. If the minimum number of tests has not been performed per the written QCTP, this must be stated in the weekly summary report with an explanation of the circumstances.

4.7.1.10 The City will maintain a copy of the Project test results and weekly reports in the Project file. In cases where quality control activities do not comply with the Agreement provisions, the City may:

- a. Order the Contractor to replace ineffective or unqualified quality control personnel.
- b. Order the Contractor to stop operations until appropriate corrective action is taken.

4.7.1.11 Although minimum testing requirements are specified herein, the Contractor bears full responsibility for the quality of the materials and their installation and may elect to perform additional testing beyond the requirements set forth herein to ensure compliance.

4.7.1.12 The Quality Control requirements contained in this Section are in addition to and separate from Quality Assurance Testing, which will be performed by the City of Chandler or its representative. If the Quality Assurance test results are not in agreement with the Quality Control test results, the Contractor will have the option to retain a third party consultant for referee tests. The third party consultant must meet the same requirements as the consultant performing the Quality Control Testing. The results of the third party will be binding. All cost incurred by the referee testing will be the Contractor's expense. If the Contractor elects not to retain a third party for referee testing, the City of Chandler test results will prevail.

4.7.1.13 Except as otherwise noted within this Section, Work or materials required by this Section are non-pay items. Per MAG Section 101, a non-pay item is an item of Work for which no separate payment will be made, the cost of which is to be included as an incidental cost for associated item(s) included on the Bid Schedule or Schedule of Values.

4.7.2 Trade Names and Substitutions.

4.7.2.1 Substitutions prior to bid will only be considered if in compliance with Arizona Revised Statute § 34-104.

4.7.2.2 Contractor, if requested by City, must submit Samples or any additional information that may be necessary to evaluate the acceptability of the substitution.

4.7.2.3 City will make the final decision and will notify Contractor in writing as to whether the substitution has been accepted or rejected.

4.7.2.4 If City does not respond within 15 working days, Contractor must continue to perform the Work in accordance with the Agreement Documents and the substitution will be considered rejected.

4.7.3 Shop Drawings.

4.7.3.1 Contractor must prepare and submit Shop Drawings which show details of all Work to insure proper installation of the Work using those materials and equipment specified under the approved Plans and Specifications.

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- 4.7.3.2 Contractor must submit a schedule of Shop Drawing submissions, which avoids bulk submissions to the extent reasonably possible, with the Project Schedule for City approval. The schedule of Shop Drawing submissions must include all of the items for which Shop Drawings are required by the Agreement Documents, including the Specifications. Unless otherwise noted, Shop Drawings will not be required for items specified or detailed in the Uniform Standard Specifications and Details or the Technical Specifications.
- 4.7.3.3 Shop Drawings must be numbered consecutively for each Specification section and must accurately and distinctly present the following:
- a. All working and erection dimensions.
 - b. Arrangements and sectional views.
 - c. Necessary details, including complete information for making connections between work under this Agreement and work under other Agreements.
 - d. Kinds of materials and finishes.
 - e. Parts list and description thereof.
- 4.7.3.4 Each Drawing or page must include:
- a. Project Name, City of Chandler Project Number and descriptions.
 - b. Submittal date and space for revision dates.
 - c. Identification of equipment, product or material.
 - d. Name of Contractor and Subcontractor.
 - e. Name of Supplier and Manufacturer.
 - f. Relation to adjacent structure of material.
 - g. Physical dimensions clearly identified.
 - h. ASTM and Federal Specifications references.
 - i. Identification of and justification for deviations from the Agreement Documents.
 - j. Contractor's stamp, initialed or signed, dated and certifying the review of submittal, certification of field measurements and compliance with Agreement.
 - k. Location at which the equipment or materials are to be installed.
- 4.7.3.5 Location will mean both physical location and location relative to other connected or attached material. City will return unchecked any submittal, which does not contain complete data on the Work and full information on related matters.
- 4.7.3.6 Stock or standard drawings will not be accepted for review unless full identification and supplementary information is shown thereon in ink or typewritten form.
- 4.7.3.7 Contractor must schedule, prepare and submit all Shop Drawings in accordance with a timetable that will allow its suppliers and manufacturers sufficient time to fabricate, manufacture, inspect, test and deliver their respective products to the project Site in a timely manner so as to not delay the complete performance of the Work.

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- 4.7.3.8 If the Shop Drawings show departures from the Agreement requirements, Contractor must make specific mention thereof in the Letter of Transmittal; otherwise review of such submittals by City will not constitute review of the departure. Review of the Drawings will constitute review of the specific subject matter for which the Drawings were submitted and not of any other structure, material, equipment, or apparatus shown on the Drawings.
- 4.7.3.9 The review of Shop Drawings will be general and will not relieve Contractor of responsibility for the accuracy of such Drawings, nor for the proper fitting and construction of the Work, nor for the furnishing of materials or Work required by the Agreement. No construction called for by Shop Drawings will be initiated until such Drawings have been reviewed and approved by City.
- 4.7.3.10 The procedure in seeking review of the Shop Drawings will be as follows:
- a. Contractor must submit complete sets of Shop Drawings and other descriptive data as specified in this Section.
 - b. After Contractor's submittal or resubmittal of Shop Drawings, if Contractor has submitted Shop Drawings in accordance with the City-approved submittal schedule, or upon resubmission, City will be provided with three (3) calendar weeks for review. Should City require additional review time above and beyond the three (3) calendar weeks, Contractor may ask for a time extension or monetary compensation, if they can present valid, factual evidence that actual damages were incurred by Contractor. City will determine the amount of the time extension or the monetary compensation to be awarded Contractor, if any, in accordance with City's Policy Statement for Calculating Delays and Damages, Appendix 1.
- 4.7.3.11 Contractor will be responsible for all extra costs incurred by City caused by Contractor's failure to comply with the procedure outline above.
- 4.7.4 Long Lead Time Items. Contractor must submit Shop Drawings, as required by the Engineer, on all long lead items to be furnished and installed as part of the project within 10 Days after the date of the executed Agreement letter issued by City. In addition, Contractor must order all long lead items to be furnished and installed as part of this Project within 3 Days after receiving approved Shop Drawings. For all long lead times for which Shop Drawings are not required, Contractor must order said long lead items within 15 Days after the date of the executed Agreement letter issued by City. Within 2 Days after ordering long lead items, Contractor must supply copies of all purchase orders, along with an accurate delivery schedule from the supplier.
- 4.7.5 Construction Water. If Contractor uses water from City's water system for construction water, Contractor must obtain a fire hydrant meter from City of Chandler Utility Services (480-782-2280) and all construction water must be obtained through the hydrant meter. Contractor must pay all fees related to the hydrant meter and all water bills for construction water. All cost for meters and construction water will be included in the Agreement Price.
- 4.8 **PROJECT RECORD DOCUMENTS**
- 4.8.1 During the construction period, Contractor must maintain at the jobsite a full-size set of prints of the Construction Document Drawings and Shop Drawings for Project Record Document purposes.

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- 4.8.2 Contractor must mark these Drawings to indicate the actual installation where the installation varies from the original Construction Documents. Contractor must give particular attention to information on elements that will be concealed, which would be difficult to identify or measure and record later. Items required to be marked include but are not limited to:
- a. Dimensional changes to the Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Locations and depths of underground utilities.
 - d. Revisions to routing of piping and conduits.
 - e. Actual equipment locations.
 - f. Changes made by Change Order or Addendum.
 - g. Details not on original Agreement Drawings.
- 4.8.3 Contractor must mark completely and accurately Project Record Drawing sets of Construction Documents.
- 4.8.4 Contractor must mark Project Record Drawings sets with red erasable colored pencil.
- 4.8.5 Contractor must note Request for Information (RFI) Numbers and Change Order numbers, etc., as required to identify the source of the change to the Construction Documents.
- 4.8.6 Contractor must submit Project Record Drawing sets and Shop Drawings to City or its representative for review and comment.
- 4.8.7 Upon receipt of the reviewed Project Record Drawings from City, Contractor must correct any deficiencies and omissions to the Drawings and submit the final original of the Project Record Drawings to City prior to Final Payment.
- 4.8.8 Project Manager will review the Project Record Drawings monthly prior to the date established for the Payment Request and will be the sole judge of acceptance of these Drawings.
- 4.9 **WARRANTY AND CORRECTION OF DEFECTIVE WORK**
- 4.9.1 Contractor warrants to City that the construction, including all materials and equipment furnished as part of the Work, will be new unless otherwise specified in the Agreement Documents, of good quality, and free of defects in materials and workmanship. Contractor's warranty obligation excludes defects caused by abuse, alterations, or unreasonable failure to maintain the construction by persons other than Contractor, subcontractors, or others under Contractor's control. Nothing in this warranty will limit any manufacturer's warranty which provides City with greater warranty rights than set forth herein or in the Agreement. Contractor will provide City with all manufacturers' warranties and operation and maintenance manuals upon substantial completion of the Work. Contractor's warranty must be for one (1) year, in accordance with MAG Specification § 108.8, and will commence for all portions of the Work upon Final Acceptance of the entire Work as determined by City under the Agreement. All statutory or other warranties, express or implied, related to latent defects will remain in force and are not limited by this provision.
- 4.9.2 City May Stop the Work. If the Work is defective, or Contractor fails to supply sufficient skilled workmen or suitable materials or equipment, City may order Contractor to stop the

Work without cost to City, or any portion thereof, until the cause for such order has been eliminated; however, this right of City to stop the Work will not give rise to any duty on the part of City to exercise this right for the benefit of Contractor or any other party.

4.9.3 Correction or Removal of Defective Work.

4.9.3.1 If required by City, Contractor must promptly, without cost to City and as specified by City, either correct any defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by City, remove it from the Site and replace it with non-defective Work. Contractor must correct any Work which may be displaced in correcting, removing or replacing defective Work. No compensation will be allowed Contractor for such removal, replacement or remedial Work. Contractor must reimburse City for costs incurred by City due to such correction or removal including but not limited to additional expenses for inspection, testing or observation and for repeated reviews by the City or Design Professional.

4.9.3.2 Upon failure on the part of the Contractor to comply within a reasonably prompt time with any written order of City to correct or remove defective Work, City has authority to cause nonconforming materials or rejected Work to be remedied, removed, or replaced at the Contractor's expense and to deduct the costs from any moneys due or to become due the Contractor.

4.9.4 City May Correct Defective Work. If Contractor fails within a reasonable time after written notice of City to proceed to correct defective Work or to remove and replace rejected Work as required by City or if Contractor fails to perform the Work in accordance with the Agreement Documents (including any requirements of the progress schedule), City may, after 7 Days' written notice to Contractor, correct and remedy any such deficiency. To the extent necessary to complete corrective and remedial action, City may exclude Contractor from all or part of the Work, and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site and incorporate in the Work all materials and equipment stored at the Site or for which City has paid Contractor, but which are stored elsewhere. Contractor must allow City, city representatives, agents and employees such access to the Site as may be necessary to enable City to exercise City's rights under this Section. All direct and indirect costs of City in exercising such rights will be charged against Contractor in an amount verified by City representative, and a Change Order will be issued incorporating the necessary revisions in the Agreement Documents and a reduction in the Agreement Price. Such direct and indirect costs will include, in particular but without limitation, compensation for additional professional services required and all costs of repair and replacement of Work or others destroyed or damaged by correction, removal or replacement of Contractor's defective Work. Contractor will not be allowed an extension of the Agreement Time because of any delay in Contractor's performance of the Work attributable to the exercise by City or City's rights hereunder.

4.9.5 Correction or Removal of Unauthorized Work.

4.9.5.1 Any Work done beyond the lines and grades shown on the Drawings or established by the Design Professional or any changes in, additions to, or deductions from the Work done without written authority will be considered as unauthorized and will not be paid for. Work so done may be ordered remedied, removed, or replaced at the Contractor's expense.

4.9.5.2 Upon failure on the part of the Contractor to comply promptly with any order of the City,

City will have authority to cause unauthorized Work to be remedied, removed, or replaced at the Contractor's expense and to deduct the costs from any moneys due or to become due the Contractor.

4.9.6 Correction Period - One Year Guarantee.

4.9.6.1 If, within one year after the date of Final Acceptance, or such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Agreement Documents, or by any specific provision of the Agreement Documents, any Work is found to be defective, Contractor must promptly, without cost to City and in accordance with City's written instructions, either correct such defective Work, or, if it has been rejected by City, remove it from the Site and replace it with non-defective Work. If Contractor does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, City may have the defective Work corrected or the rejected Work removed and replaced, and all direct and indirect costs of such removal and replacement, including compensation for additional professional services, must be paid by Contractor. Such action by the City will not relieve the Contractor of the guarantees required by this Section or elsewhere in the Agreement Documents.

4.9.6.2 If, in the opinion of the City, defective Work creates a dangerous condition or requires immediate correction or attention to prevent further loss to the City or to prevent interruption of operation of the City, the City will attempt to give the notice required by this Section. If the Contractor cannot be contacted or does not comply with the City's request for correction within a reasonable time as determined by the City, the City may, notwithstanding the provisions of this Section, proceed to make such correction or provide such attention; and the costs of such correction or attention will be charged against the Contractor. Such action by the City will not relieve the Contractor of the guarantees required by this Section or elsewhere in the Agreement Documents.

4.9.6.3 This Section does not in any way limit the guarantee on any items for which a longer guarantee is specified or on any items for which a manufacturer or supplier gives a guarantee for a longer period. The Contractor agrees to act as co-guarantor with such manufacturer or supplier and must furnish the City all appropriate guarantee or warranty certificates upon completion of the Project. No guarantee period, whether provided for in this Section or elsewhere, will in any way limit the liability of Contractor or their sureties or insurers under the indemnity or insurance provisions of these General Conditions and the Project Specific Special Conditions.

4.9.7 Acceptance of Defective Work.

4.9.7.1 If, instead of requiring correction or removal and replacement of defective Work, City may accept Work when in the best interest of the City to do so with appropriate monetary credit from Contractor. If any such acceptance occurs prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Agreement Documents, including appropriate reduction in the Agreement Price; or, if the acceptance occurs after final payment, an appropriate amount must be paid by Contractor to City.

4.9.7.2 Alternatively, City may require Contractor to furnish at Contractor's expense, a special performance guarantee or other surety prior to acceptance of defective work.

4.9.8 The Warranty period begins on the Final Acceptance date noted in the Certificate of Completion, irrespective of early completion by some Subcontractors of their work.

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- 4.9.9 Contractor's warranty obligation must be in accordance with MAG Specifications.
- 4.9.10 Nothing in the warranties contained in the Agreement Documents are intended to limit any manufacturer's warranty which provides City with greater warranty rights than set forth in this Section or the Agreement Documents. Contractor must provide City with all manufacturers' warranties prior to Substantial Completion, if applicable, or Final Acceptance.
- 4.9.11 Contractor agrees that it will be responsible to manage and administer the correction of any Work that is not in conformance with the Agreement Documents during the warranty periods set forth in this Section, or during any longer periods to the extent required by the Agreement Documents. A progress payment, or partial or entire use or occupancy of the Project by City, will not constitute acceptance of Work not in accordance with the Agreement Documents.
- 4.9.12 When notified of a warranty issue, Contractor must respond in writing within 48-hours and must perform warranty Work as soon as material for said repairs are available (as judged solely by City), and in any event Contractor must, take immediate steps to commence and complete correction of nonconforming Work no later than the time period set forth in City's written notification in accordance with the Agreement Documents. This includes the correction, removal or replacement of the nonconforming Work and any damage caused to other parts of the Work affected by the nonconforming Work. If defects develop which are determined by City to be an emergency, City will notify Contractor, via the most expeditious means regarding the nature and condition of the defects. In turn, Contractor must immediately dispatch necessary forces to correct the defect or the emergency condition in accordance with Agreement Documents.
- 4.9.13 The time periods referenced in this Section apply only to Contractor's obligation to correct nonconforming Work and is not intended to constitute a period of limitations for any other rights or remedies that City may have regarding Contractor's other obligations under the Agreement Documents.
- 4.9.14 Without limiting the foregoing or anything in these General Conditions or the Agreement to the contrary, Contractor must obtain and provide to City all warranties for any portion of the Project offered by the manufacturer, installer or provider thereof. City and the user of the facility will have the right to the full value and benefit of all such warranties. Contractor must ensure all such warranties are fully transferrable to facilitate the full value of this Section.
- 4.9.15 Contractor's warranty excludes damages or defects caused by abuse, alterations to the Work not executed by or through Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage.
- 4.9.16 In the event of any noncompliance with this entire Section 4, City may require Contractor to stop or suspend the Work in whole or in part.

SECTION 5 - CITY RESPONSIBILITIES**5.1 CITY PROJECT MANAGER AND INSPECTORS**

- 5.1.1 Project Manager is responsible for providing City-supplied information and approvals in a timely manner to assist Contractor to fulfill its obligations under the Agreement Documents.

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- 5.1.2 Project Manager will also provide Contractor with prompt notice when it observes any failure on the part of Contractor to fulfill its contractual obligations, including any default or defect in the Project or non-conformance with the Drawings and Specifications.
- 5.1.3 City may utilize Field Inspectors to assist Project Manager during construction in observing performance of Contractor. City's use of Inspectors is for the purpose of assisting Project Manager.
- 5.1.4 The Inspectors are authorized to inspect all Work and materials furnished. Such inspections may extend to all or part of the Work and to preparation, fabrication or manufacture of the materials to be used. The Inspectors have the authority to issue instructions contrary to the Construction Documents if approved and coordinated with the directions of Project Manager.
- 5.1.5 The Inspectors have the authority to reject work or materials until any questions at issue can be decided by Project Manager.
- 5.1.6 The use of Inspectors by City will not make City responsible for or give City control over construction means, methods, techniques, sequences or procedures or for safety precautions or programs or responsibility for Contractor's failure to perform the Work in accordance with Agreement Documents. The Inspectors are not authorized to direct any of Contractor's activities, employees or Subcontractors.

5.2 **DESIGN PROFESSIONAL SERVICES**

City may contract separately with one or more Design Professionals to provide construction administration of the Project. The Design Professional's Agreement, as well as other firms hired by City may be furnished to Contractor. Contractor does not have the right to limit or restrict or reject any Agreement modifications that are mutually acceptable to City and Design Professional.

5.3 **CITY'S SEPARATE CONTRACTORS**

City is responsible for all work performed on the Project or at the Site by separate contractors retained by City. City will contractually require its separate contractors to reasonably cooperate with, and reasonably coordinate their activities so as not to interfere with Contractor in order to enable Contractor to timely complete the Work consistent with the Agreement Documents. Contractor must immediately notify the Project manager, and address the matter in the next monthly status report, if any activities of such separate contractors are expected to interfere, or are interfering, with Contractor and such interference will or could result in any delay in Contractor's performance of the Work.

5.4 **PERMIT REVIEW AND INSPECTIONS**

- 5.4.1 If requested by Contractor, Project Manager will provide assistance and guidance in obtaining necessary reviews, permits and inspections.
- 5.4.2 The regulating agencies of City, such as Development and Sustainability, Fire and Planning Departments, enforce legal requirements. The enforcement activities of City are independent and separate from this Agreement.

5.5 **PLANS AND SPECIFICATIONS TO THE CONTRACTOR**

Contractor will be provided up to five copies of the Agreement Documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished,

upon request, at the cost of reproduction.

SECTION 6 - AGREEMENT TIME

6.1 AGREEMENT TIME

- 6.1.1 The Agreement Time will start with the Notice to Proceed ("NTP") and end with Final Acceptance.
- 6.1.2 Beginning on the date of the NTP, Contractor must begin to fulfill Contractor's obligations under the Agreement. Contractor's obligations include providing City and other agencies with any submittals required by the Project Specific Special Provisions, including but not limited to, an approved Project Schedule, Traffic Control Plans, and a Stormwater Pollution Prevention Plan. Contractor must submit all such required submittals before any physical construction work commences on the Site. NTP does not authorize construction work until all agreement insurance, bonds, and schedules are submitted to and accepted by the City.
- 6.1.3 The Agreement Time will be as set forth in the Project Schedule. Contractor agrees that it will commence performance of the Work and complete the Project through both Substantial Completion and Final Acceptance within the Agreement Time.
- 6.1.4 Time is of the essence of this Agreement, for the Project, for the Work, and for each phase and designated Milestone thereof.
- 6.1.5 Failure of Contractor to perform any covenant or condition contained in the Agreement Documents within the time periods specified herein, will constitute a material breach of this Agreement entitling City to terminate the Agreement unless Contractor applies for and receives an extension of time, in accordance with the procedures set forth in the Agreement Documents.
- 6.1.6 Failure of City to insist upon the performance of any covenant or condition within the time periods specified herein, will not constitute a waiver of Contractor's duty to perform every other covenant or condition within the designated periods, unless a specific waiver is granted in writing for each such covenant or condition.
- 6.1.7 City's agreement to waive a specific time provision or to extend the time for performance will not constitute a waiver of any other time provisions contained in the Agreement Documents. Failure of Contractor to complete performance promptly within the additional time authorized in the waiver or extension of time agreement constitutes a material breach of this Agreement entitling City to all the remedies set forth herein or provided by law.

6.2 PROJECT SCHEDULE

- 6.2.1 The Project Schedule must be in Microsoft Project standard file format, must be updated and maintained throughout the Agreement Time, and must contain the following:
 - 6.2.1.1 Detailed representation of all activities for the project, both on-site construction and major procurement. All significant activities together with the resource loading requirements for each and all items appearing on the schedule of values or bid schedule for progress payments must be shown on the Project Schedule or in attached transmittal letter as described in Section 6.2.8.

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- 6.2.1.2 Dependencies between activities must be indicated so that it may establish as to the effect the progress of any one activity would have on other activities and on the Schedule.
- 6.2.1.3 Activities for submission, review, and approval of all required submittals.
- 6.2.1.4 An amount of time will be established prior to the final completion date for “punch list and cleanup”. No other activities will be scheduled during this period. Punch list and cleanup must be shown on the Project Schedule and must be entirely completed prior to the expiration of the Agreement Time.
- 6.2.2 Within 10 Days of receipt of City’s comments, Contractor must make all required corrections, adjustments, and additions to complete the Project Schedule and resubmit to City for review. City’s review of and response to the Project Schedule is for the purpose of: (1) City planning and staffing for the Project as may be required from time to time; (2) ensuring Contractor’s general conformance with the scheduling requirements of the Agreement Documents and completion of the Project within the Agreement Time; and (3) monitoring and evaluating the construction status for purposes of approving monthly progress payments. Acceptance of a submitted schedule by City should in no way be construed as an affirmation or admission that the schedule is reasonable or workable by Contractor. The responsibility for completing the Work on the Project within the Agreement Time remains the obligation of Contractor. City’s review does not relieve Contractor from compliance with the requirements of the Agreement Documents or be construed as relieving Contractor of its complete and exclusive control over the means, methods, sequences and techniques for executing the work.
- 6.2.3 The Project Schedule must show milestones, including milestones for City-furnished information, and must include activities for City-furnished material and construction by other contractors when those activities are interrelated with Contractor activities.
- 6.2.4 The Project Schedule must be revised as required by conditions and progress of the Work, but such revisions do not relieve Contractor of its obligations to complete the Work within the Agreement Time, as adjusted in accordance with the Agreement Documents. No modification to the Agreement Documents or the Agreement Time will be effective unless approved in advance by City.
- 6.2.5 For all items of materials and equipment that are critical or may require long lead times to acquire, the Project Schedule must show dates for submission, review and approval of submittals, ordering, and delivery.
- 6.2.6 An updated Project Schedule must be submitted monthly to City as part of the Payment Request. The monthly submittal must include one full size plot of the entire schedule and one electronic copy containing the schedule in Microsoft Project standard file format. In addition, Contractor must, upon request by City, provide a copy of all submitted schedule data in electronic format which must be clearly labeled with the Project description, scheduling program name and version number, and schedule print/data date.
- 6.2.7 Contractor must provide City with a monthly status report with each Project Schedule detailing the progress of the Work, including: (i) if the Work is proceeding according to schedule, (ii) any discrepancies, conflicts, or ambiguities found to exist in the Agreement Documents that require resolution, and (iii) other information detailing items that require resolution so as not to jeopardize the ability to complete the Work in the Agreement Time.

- 6.2.8 With each Project Schedule submittal, Contractor must include a transmittal letter including the following:
- a. Description of problem tasks, referenced to field instructions or requests for information (RFI's), as appropriate.
 - b. Current and anticipated delays including:
 - (i) Cause of the delay.
 - (ii) Corrective action and schedule adjustments to correct the delay.
 - (iii) Known or potential impacts and their delay on other activities, milestones, and their impact on the Substantial Completion and Final Acceptance dates.
 - (iv) Changes in construction sequence.
 - c. Pending items and status thereof including but not limited to:
 - (i) Time Extension requests;
 - (ii) Substantial Completion date status;
 - (iii) Final Acceptance date status.
 - d. If ahead of schedule, the number of calendar Days ahead.
 - e. If behind schedule, the number of calendar Days behind.
 - f. Other Project or scheduling concerns.
- 6.2.9 Critical Path Method (CPM).
- 6.2.9.1 Unless otherwise specified in the Agreement, the Project Schedule must include a Critical Path Method (CPM) diagram schedule showing the sequence of activities, the interdependence of each activity and identifies the Critical Path.
- 6.2.9.2 The CPM diagram schedule must be in calendar 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 must be presented in a time scaled graphical format for the Project as a whole.
- 6.2.9.3 The CPM diagram schedule must indicate all relationships between activities.
- 6.2.9.4 The activities making the Project Schedule must contain 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 evaluation the progress of the Work. Individual activities must not exceed 30 Days in length, in most cases.
- 6.2.9.5 The CPM diagram schedule must be based upon activities, which coincide with the Schedule of Values.
- 6.2.9.6 The CPM diagram schedule must show all submittals associated with each work activity and the review time for each submittal.
- 6.2.10 Float Time.
- 6.2.10.1 The total Float Time within the overall schedule is for the exclusive use of City, but City may approve Contractor's use of Float as needed to meet Agreement Milestones and

the Project completion date.

- 6.2.10.2 Contractor will not be allowed to sequence, hide, or reallocate Float Time through such strategies, as extending activity duration estimates to consume available Float, using preferential logic, or using extensive crew/resource sequencing, etc. No time extensions will be granted nor delay damages paid until a delay occurs which extends the Work beyond the Agreement Time.
- 6.2.11 City-Caused Delays. City-caused delays on the Project, if any, may be offset by City-caused time savings (i.e., Critical Path submittals returned in less time than allowed by the Agreement, approval of substitution requests and credit changes which result in savings of time to Contractor, etc.) In such an event, Contractor will not be entitled to receive a time extension or delay damages until all City-caused time savings are exceeded and the Agreement Time is also exceeded.
- 6.2.12 Rain-Related Delays. Contractor is required, in preparing the Project Schedule to take into account all relevant weather conditions, including normal rainfall and distribution. No additional compensation will be given for any rain-related delays or impacts on the Work or the Project Schedule. No time extension will be granted in the Project Schedule unless the rainfall during the construction of Work is unusually severe, was not reasonably anticipated, and the total rainfall was significantly in excess of the normal rainfall for the Project Site location. Normal rainfall for the Project will be determined from the 10-year average rainfall for the Site as measured by the National Oceanic and Atmospheric Administration or comparable source of reliable information for rainfall in Chandler, Arizona. In addition, the excessive rainfall must have actually impacted Work activities on the Critical Path and caused delay beyond any remaining Float at the time of the rain-caused delay. The burden of documenting normal rainfall, the excessive rainfall and the impact on Critical Path activities is on Contractor. All other provisions in the Agreement Documents relating to claims, including without limitation notice requirements, apply to any claim by Contractor for a rain delay.
- 6.2.13 City's "Policy Statement for Calculating Delays and Damages," Appendix 1 to these General Conditions, will apply to all claims of delay and delay damages.
- 6.2.14 Force Majeure. If Contractor is delayed or prevented from the performance of any Work required under this Agreement by reason of acts of God or other causes beyond the control and without fault of Contractor (financial inability excepted), performance of that Work will be excused, but only for the period of the delay. The time for performance of the Work will be extended for a period equivalent to the period of delay. In addition, the parties agree if Contractor's delayed or suspended performance directly arises out of or directly results from the COVID-19 pandemic, Contractor's delayed or suspended performance may be excused as set forth in this clause. Provided, however; Contractor must give the City written notice within 30 days of the occurrence of the event giving rise to COVID-19 pandemic related delayed or suspended performance. For COVID-19 pandemic related delay or suspended performance, the parties must agree in writing to the length of the excused delay or suspended performance. Further, Contractor must obtain the City's written approval to use any allowance established as part of the project for delays and costs related to the COVID-19 pandemic.

6.3 **SUBSTANTIAL COMPLETION**

- 6.3.1 When Contractor considers that the Work, phase or a portion thereof, which City agrees in

writing to accept separately, is substantially complete, City will prepare and submit to Contractor a comprehensive Punch List of items to be completed or corrected prior to Final Acceptance and Final Payment. Failure to include an item on such Punch List does not alter the responsibility of Contractor to complete all Work in accordance with the Agreement Documents.

6.3.2 Upon receipt of Contractor's Punch List, Project Manager will make an inspection to determine whether the Work or designated portion thereof is substantially complete. Project Manager may, at Project Manager's sole option, be assisted in such inspection by the Design Professional for the Project. If the inspection by the Project Manager discloses any item, whether or not included on Contractor's Punch List, which is not sufficiently completed in accordance with the Agreement Documents so that City can occupy or utilize the Work, phase or designated portion thereof for its intended use, Contractor must, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by Project Manager. In such case, Contractor must then submit a request for another inspection by Project Manager to determine Substantial Completion.

6.3.3 Certificate of Substantial Completion.

6.3.3.1 The Project Manager will not issue a Certificate of Substantial Completion unless and until the Work (or separable units or Phases as provided in the Agreement Documents) is essentially and satisfactorily complete in accordance with the Agreement Documents, such that the Project is ready for use by City for its intended purpose, opening to the general public, full occupancy or use by City (including, without limitation, all separate units, or rooms, facilities, access, income-generating areas, and all areas serving the general public, as applicable, must be ready for full-operation without material inconvenience or discomfort), including, to the extent applicable to the Work, the following: all materials, equipment, systems, controls, features, facilities, accessories and similar elements are installed in the proper manner and in operating condition, inspected and approved; surfaces have been painted; masonry and concrete cleaned with any sealer or other finish applied; utilities and systems connected and functioning; site work complete; permanent heating, ventilation, air condition, vertical transportation and other systems properly operating with proper controls; lighting and electrical systems installed, operable and controlled; paving completed, signage installed, and other Work as applicable, has been performed to a similar state of essential and satisfactory completion. A minor amount of Work, as determined by and at the discretion of the Project Manager, such as installation of minor accessories or items, a minor amount of painting, minor replacement of defective work, minor adjustment of controls or sound systems, or completion or correction of minor exterior work that cannot be completed as a result of weather conditions, will not delay determination of Substantial Completion. If prior written approval is obtained from City for purposes of Substantial Completion, specified areas of the entire Work or Project may be individually certified as Substantially Complete. In no event will Substantial Completion be deemed to have occurred unless and until: (i) a temporary certificate of occupancy has been issued by the appropriate Governmental Authorities (as applicable) and (ii) all terms and Work required under this Agreement have been fulfilled by Contractor and same will have also been approved and accepted by City, subject only to the Punch List items.

6.3.3.2 If requested by City, Contractor must complete and turn-over to City the Project on a phased basis. Each phase will have a separate inspection by the Project Manager, a Punch List generated, and then an inspection by City with final approval and acceptance only after the

Project Manager's Punch List.

6.4 **PARTIAL UTILIZATION**

6.4.1 City at City's option may use and occupy any substantially completed parts of the Work which has specifically been identified in the Agreement Documents, or which City, the Design Professional and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by City for its intended purpose, without significant interference with Contractor's performance of the remainder of the Work, provided, however, if the portion of the Work to be used or occupied has not been found to be substantially complete, City must do so in accordance with Section 6.3 prior to such occupancy.

6.4.2 In lieu of the issuance of a Certificate of Substantial Completion as to part of the Work, City may take over operation of a facility constituting part of the Work whether or not it is substantially complete if such facility is functionally and separately usable; provided that prior to any such takeover, City and Contractor agree in writing as to the division of responsibilities between City and Contractor for security, operation, safety, maintenance, correction period, heat, utilities and insurance with respect to such facility.

6.4.3 Substantial Completion of or City's beneficial occupancy of a part of the Project will not alter the fact that the one-year warranty for the whole Project starts at the date of Final Completion of the whole Project.

6.5 **FINAL ACCEPTANCE**

6.5.1 Unless otherwise expressly agreed to in writing by City, Final Acceptance must be obtained by no later than 30 Days (60 Days for federally funded agreements) after the date of Substantial Completion. Failure to timely obtain Final Acceptance will be a material breach of the Agreement.

6.5.2 Upon receipt of written notice that the Work is ready for final inspection and acceptance, City and Contractor will jointly inspect to verify that the remaining items of Work have been completed. There will be no partial acceptance. Final Acceptance will not occur until all items of Work, including Punch List Items, have been completed to City's satisfaction as reflected in the written Final Acceptance.

6.5.3 Final Payment will not be due, owing, or paid by City until Final Acceptance is issued.

6.5.4 Landscape Establishment Period. Unless otherwise expressly agreed to in writing by City, the Landscape Establishment Period will begin on the date of Final Acceptance of the Project and will run 90 Calendar Days thereafter. Landscape Establishment Period requirements are detailed in General Conditions Appendices, attached herein.

6.6 **CONTINUATION OF WORK**

6.6.1 Permitting Contractor to continue and finish the Work or any part of it after the time fixed for its completion (whether milestone, phase, Substantial Completion or Final Acceptance) or after the date to which the time fixed for any completion may have been extended, does not operate as a waiver by City of any rights under the Agreement Documents, law or equity.

6.6.2 Furthermore, the timely completion of the Work being of the utmost importance under this Agreement, notwithstanding the existence of one or more disputes between the parties

concerning the scope of the Work, the Project Schedule, Agreement Time, payments or any other matter, and further notwithstanding a party's invocation of the Dispute Resolution provisions specified in Appendix 6 of these General Conditions, unless City suspends the Agreement or Contractor's performance pursuant to Section 10 of these General Conditions, Contractor will continue to prosecute the Work, including any Change Order work or Extra Work Orders, in a diligent and timely manner and not stop, slow down or impede by action or inaction the progress of the Work, including commencing performance of and thereafter completing any additional work called out in any Change Order or Extra Work Order issued by Project Manager with the approval of City, so long as City makes payment to Contractor in accordance with Section 8 of these General Conditions.

SECTION 7 - AGREEMENT PRICE

7.1 UNIT PRICE AGREEMENTS

- 7.1.1 The Agreement Price for all Unit Price Agreements will be the amount set forth in the Agreement or Change Order multiplied by the verified quantity provided.
- 7.1.2 Measurements of quantities to determine the total Agreement Price must be in accordance with MAG Specification §§ 109.1 and 109.2.
- 7.1.3 The Unit Price may only be changed as set forth in Section 9 below.

7.2 CHANGE ORDERS

- 7.2.1 Unit Price Change Orders. The Change Order Price for all Unit Price Change Orders will be the amount set forth in the Change Order multiplied by the verified quantity provided.
- 7.2.2 Measurements of quantities to determine the total Change Order Price must be in accordance with MAG Specifications §§ 109.1 and 109.2.
- 7.2.3 The Unit Price may only be changed as set forth in Section 9 below.
- 7.2.4 MAG Specification § 109.4.1 is modified as follows: Before § 109.4.1, the following is added: Any deduction or increase in the Agreement Price must be supported by a signed, written Change Order fully executed by City, and supported by such backup as the Project Manager may require.

7.3 SALES TAX

Contractor is required to pay all applicable sales tax in accordance with the law of the state of Arizona and this cost must be included in all Agreement Prices. When equipment, materials or supplies generally taxable to Contractor are eligible for a tax exemption due to the nature of the Project, Contractor must assist City in applying for and obtaining such tax credits and exemptions which will be paid or credited to City.

SECTION 8 - PAYMENT

8.1 PAYMENT FOR CONSTRUCTION SERVICES

- 8.1.1 Payment for the Work will be made in accordance with MAG Standard Specification § 109 as amended below.
- 8.1.2 Contractor must submit to City for review a completed Contractor Payment Request signed

by Contractor, covering the Work completed as of the date of the Request and accompanied by such supporting documentation as is required by the Agreement Documents and also as City may reasonably require. A Contractor Payment Request will not be considered complete unless it is accompanied by an updated Project Schedule and a certification that the on-site, red lined, as built Drawings are up to date. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably, securely stored at the Site or at another location (such as a bonded warehouse) agreed to in writing, the Contractor Payment Request must also be accompanied by such data, satisfactory to City, as will establish City's title to the material and equipment and protect City's interest therein, including applicable insurance. Each subsequent Contractor Payment Request must include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied to discharge in full all of Contractor's obligations reflected in prior Contractor Payment Requests.

- 8.1.3 Except for Work performed under a JOC Agreement, the Contracting Agency will retain 10 percent of all estimates as a guarantee for complete performance of the Agreement in accordance with Arizona Revised Statutes Section 34-221 or 34-607. The Contractor may elect to deposit securities in lieu of retention in accordance with Arizona Revised Statutes Section 34-221, Paragraph C.5. or 34-607, Paragraph B.5.
- 8.1.4 The payment process functions as follows: Prior to the payment cycle date, Contractor must send a draft Contractor Payment Request to Project Manager. The Project Team will review the Request and agree upon any necessary adjustments. Contractor must certify the final Request by signing and returning to Project Manager.
- 8.1.5 When construction of the Project is fifty percent (50%) completed, Contractor may request payment of one-half of the retention pursuant to A.R.S. § 34-609(B)(3), subject to all of City's rights to withhold or offset payments, and other rights of City, under the Agreement.
- 8.1.6 City reserves the right under A.R.S. § 34-609(B)(3) to reinstate the ten percent (10%) retention if City determines that satisfactory progress is not being made.
- 8.1.7 Contractor's Warranty of Title.
 - 8.1.7.1 Contractor warrants and guarantees that title to all Work, materials and equipment covered by any Contractor Payment Request, whether incorporated in the Project or not, will pass to City at the time of payment, free and clear of all liens, claims, security interests, and encumbrances, provided that this will not preclude the Contractor from installing metering devices or other equipment of utility companies or municipalities, the title of which is commonly retained by the utility company or municipality.
 - 8.1.7.2 No materials, supplies, or equipment for the Work under this Agreement will be purchased subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest therein, or any part thereof, is retained by the seller or supplier.
 - 8.1.7.3 Nothing contained in this Section will defeat or impair the right of such persons furnishing materials or labor under any bond given by the Contractor for their protection, or any right under any law permitting such persons to look to funds due the Contractor in the hands of the City. The provisions of this Section must be inserted in all subcontracts and material agreements, and notices of its provision must be given to all persons furnishing materials for the Work when no formal agreement is entered into for such materials.

8.2 PAYMENT UPON SUBSTANTIAL COMPLETION

8.2.1 No payment will be made upon Substantial Completion, except for a regularly-scheduled monthly progress payment, as allowed by Section 8.2.2.

8.2.2 No further payments will be made to Contractor until Final Acceptance.

8.3 FINAL PAYMENT

8.3.1 Subject to all of City's rights to withhold or offset payment, and other rights under the Agreement, Final Payment including remaining retainage will be paid only after:

- a. Work has been fully completed (including completion of all incorrect or incomplete work items) and the written Final Acceptance has been issued by City;
- b. Necessary operating manuals, any excess materials and supplies necessary for matching materials and supplies incorporated into the Work, acceptable sewer video results (if applicable), and complete "as-built" Drawings (including the Building Information Model, if required by the Agreement Documents) have been delivered to City, as specified in this Section 8.3;
- c. Full and unconditional lien waivers and releases by Contractor and any person performing labor or supplying material, machinery, fixtures, or tools for the Work have been delivered to Contractor;
- d. All conditions and requirements imposed by City or any financing entity for the corresponding disbursement have been met; and
- e. Contractor delivers to City a Contractor Payment Request requesting Final Payment.

8.3.2 Contractor must also submit a signed copy of Contractor's Affidavit Regarding Settlement of Claims, Appendix 3 to these General Conditions, and Certificate of Completion, Appendix 7 to these General Conditions, prior to Final Payment.

8.3.3 In addition, if required under the Project Specific Special Provisions, Contractor must compile a complete equipment list and maintenance manual to be submitted to City as a precondition to Final Payment. The list must include the following items for all equipment supplied under the Plumbing, Electrical, Air Conditioning, Elevator, and other Special Equipment Specifications:

- a. Name, Model and Manufacturer.
- b. Complete parts lists and Drawings.
- c. Local source of supply for replacement parts along with suppliers' telephone numbers.
- d. Local service organizations serving the equipment and their telephone numbers.
- e. All tags, inspection slips, instruction packages, etc., removed from equipment must be properly identified as to pieces of equipment from which they were taken.

8.3.4 Contractor must also deliver to City, prior to Final Payment, one (1) digital (in the format specified by City), and if requested by City, one (1) hard copy, of any applicable Maintenance manuals. Each manual must include all manufacturer's operation and maintenance instructions and "as-built" Drawings with the list herein specified. It must also include all other diagrams and instructions necessary to properly operate and maintain the equipment, the name, address and telephone number of Contractor and all Subcontractors involved.

8.4 **CITY'S RIGHT TO WITHHOLD PAYMENT**

City may withhold payment to such extent as may be necessary in City's opinion to protect City from loss for which Contractor is responsible, including, without limitation, if any of the following conditions exist:

- a. Defective Work not remedied;
- b. Third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to City is provided by Contractor;
- c. Failure of Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- d. Reasonable evidence that the Work cannot be completed for the unpaid balance of the Agreement Price;
- e. Damage to City or another Contractor;
- f. Reasonable evidence that the Work will not be completed within the Agreement Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- g. Failure to carry out the Work in accordance with the Agreement Documents; or
- h. Contractor is in default of any of its other obligations under the Agreement Documents.

8.5 **JOINT/DIRECT CHECKS**

To promote the timely completion and progress of the Work or when appropriate and necessary, payments to Contractor may be made jointly to Contractor and its employees, agents, Subcontractors and suppliers, or any of them. For federally funded agreements, see federal provisions for additional requirements for the joint check process.

8.6 **PAYMENT NOT A WAIVER**

No payment (nor use or occupancy of the Project by City) will be deemed acceptance or approval of the Work or as a waiver of any claims, rights, or remedies of City.

8.7 **LIENS AND BOND CLAIMS**

Contractor must make all payments, in the time required, of all labor and materials furnished to Contractor in the course of the Work and must promptly furnish evidence of such payments as City may require. Contractor must pay when due all claims arising out of performance of the Work covered by this Agreement for which a lien may be filed either against the real estate or leasehold interest of City, or against payments due from City to Contractor, or for which a claim may be made against any payment or performance bond or both. To the fullest extent permitted by law, Contractor agrees that no liens or other claims in the nature of a lien against the real estate, leasehold, or other interest of City,

against payment due from City to Contractor, or against any payment or performance bond, must be filed or made in connection with the Work by any party who has supplied professional services, labor, materials, machinery, fixtures, tools, or equipment used in or in connection with the performance of this Agreement, and Contractor agrees to remove or to cause to be removed any such liens or claims in the nature of a lien or bond claim within 10 Days upon receiving notice or obtaining actual knowledge of the existence of such liens or claim. In addition, Contractor agrees to defend, indemnify, and hold harmless City from and against any and all such liens and claims. This paragraph does not apply to claims and liens of Contractor due to non-payment for work performed.

8.8 **FINANCIAL RECORDKEEPING AND CITY'S AUDIT RIGHT**

8.8.1 Records for all Agreements between City and Contractor must, upon reasonable notice, be open to inspection and subject to audit, scanning, and reproduction during normal business working hours. Such audits may be performed by any City's representative or any outside representative engaged by City for the purpose of examining such records. City or its designee may conduct such audits or inspections throughout the term of this Agreement and for a period of five years after Final Payment or longer if required by law. City's representatives may (without limitation) conduct verifications such as counting employees at the Site, witnessing the distribution of payroll, verifying information and amounts through interviews and written confirmations with Contractor employees, field and agency labor, Subcontractors, and vendors.

8.8.2 Contractor's "records" must include any and all information, materials and data of every kind and character, including without limitation, records, books, papers, documents, subscriptions, recordings, agreements, purchase orders, leases, contracts, commitments, arrangements, notes, daily diaries, superintendent reports, drawings, receipts, vouchers and memoranda, and any and all other agreements, sources of information and matters that may in City's judgment have any bearing on or pertain to any matters, rights, duties or obligations under or covered by any Agreement Document. Such records must include (hard copy, as well as computer readable data if it can be made available), written policies and procedures; time sheets; payroll registers; payroll records; cancelled payroll checks; subcontract files (including proposals of successful and unsuccessful bidders, bid recaps, negotiation notes, etc.); original bid estimates; estimating work sheets; correspondence; Change Order files (including documentation covering negotiated settlements); back-charge logs and supporting documentation; invoices and related payment documentation; general ledger, information detailing cash and trade discounts earned, insurance rebates and dividends; and any other Contractor records which may have a bearing on matters of interest to City or the Project in connection with Contractor's dealings with City or the Project (all foregoing hereinafter referred to as "records") to the extent necessary to adequately permit evaluation and verification of any or all of the following:

- a. Compliance with Agreement requirements for deliverables;
- b. Compliance with approved Plans and Specifications;
- c. Compliance with § 14.9 below;
- d. Compliance with Agreement provisions regarding the pricing of Change Orders;
- e. Accuracy of Contractor representations regarding the pricing of invoices; or
- f. Accuracy of Contractor representations related to claims submitted by

Contractor or any of their employees.

- 8.8.3 Contractor must require all payees (examples of payees include Subcontractors, Suppliers, Insurance Carriers, etc.) to comply with the provisions of this Section by including the requirements hereof in a written agreement between Contractor and payee. Contractor will ensure that all payees (including those entering into lump sum agreements) have the same right to audit provisions contained in this Agreement included in their agreements with Contractor.
- 8.8.4 City's authorized representative(s) (including, without limitation, Project Manager) must have reasonable access to Contractor's facilities, must be allowed to interview all current or former employees to discuss matters pertinent to the performance of this Agreement and must be provided adequate and appropriate work space, in order to conduct audits in compliance with this Section.
- 8.8.5 If an audit inspection or examination in accordance with this Section, discloses overpricing or overcharges to City (of any nature) by Contractor or Contractor's Subcontractors in excess of \$100,000 in addition to making adjustments for the overcharges, the reasonable actual cost of City's audit must be reimbursed to City by Contractor. Any adjustments or payments which must be made as a result of any such audit or inspection of Contractor's invoices or records must be made within a reasonable amount of time (not to exceed 90 Days) from presentation of City's findings to Contractor.
- 8.8.6 In addition to the normal paperwork documentation Contractor typically furnishes to City, Contractor agrees to furnish, upon written request from City, any of the documentation necessary for City to exercise its audit rights under this Section 8.8 in computer readable file formats (Word, Excel, or .pdf), as City may designate.
- 8.8.7 City, its authorized representative, and the appropriate agency, reserve the right to audit Contractor's records in compliance with local, state or federal policies, statutes or at City's discretion, within three (3) years of Final Acceptance of the Work.

SECTION 9 - CHANGES TO THE AGREEMENT

- 9.1 **FIELD ORDERS**
City may authorize minor changes in the Work not involving an adjustment in the Agreement Price or the Agreement Times, which are consistent with the overall intent of the Agreement Documents. These may be accomplished by a written Field Order on the standard form approved and executed by City. Such Field Orders must be binding and Contractor must perform the change promptly. If Contractor believes that a Field Order justifies an increase in the Agreement Price or Agreement Time, Contractor may make a claim therefor as provided in Section 7.2.
- 9.2 **EXTRA WORK/CHANGES IN THE WORK**
 - 9.2.1 City reserves the right to make such changes in the Plans and Specifications for the Work, as it may deem appropriate and any such change as set forth in a written Change Order must be deemed a part of this Agreement as if originally incorporated herein.
 - 9.2.2 In the event City and Contractor cannot agree on the terms of a Change Order, or when circumstances otherwise require, the Project Manager has the authority to direct the Contractor to perform extra work, if the work in question is an item not provided for in the

Agreement as awarded. The Project Manager will have the authority to determine, based upon factual evidence presented by the Contractor, whether the work in question is an item not provided for in the Agreement as awarded. If the Project Manager directs the Contractor to perform extra work, the Project Manager's instructions will include a price that the Contractor cannot exceed in charging the City for the extra work. Upon receipt of the Project Manager's directions to perform extra work, the Contractor must promptly proceed with the extra work and document the actual cost thereof. Contractor's right to payment for extra work will be determined under Subsection 9.2.4 below. The Contractor is responsible to manage the extra work to ensure that the price limits set by the Project Manager are not exceeded. Contractor must perform the extra work and submit documentation for the actual cost of the extra work to the City. A Change Order will be issued to cover this work.

9.2.3 Contractor will not be entitled to payment for extra work unless a written Change Order, in form and content prescribed by City, has been executed by City. On all requests for Change Orders, Contractor must specify the increased or decreased costs and whether it believes any extensions of time will be necessary to complete its Work as modified by the Change Order. If extra work is performed under Subsection 9.2.2 above, a corresponding Change Order will be prepared, approved and processed by City before payment can be made to Contractor.

9.2.4 In general, pricing for Change Orders will include the same mark-up percentages that were in effect when the Agreement was awarded. The cost or credit to the City resulting from a change in the Work is subject to Appendix 1 (Policy Statement for Calculating Delays and Damages) and will be determined, based on the type of pricing for the Agreement involved, as follows:

- a. By mutual acceptance of a lump sum properly itemized in a form acceptable to City;
- b. By unit prices stated in the Agreement Documents;
- c. When the City determines that a Unit Price Book Job Order associated with a Job Order Agreement requires a Change Order, by using the same Total Cost Data and CCI that are in effect when the Change Order is anticipated to be issued; or
- d. By actual cost and a percentage fee covering overhead and profit, as follows:
 - (i) Contractor will perform the extra work and be compensated for actual cost of labor, materials and equipment.
 - (ii) Contractor will have the right to add the fee percentage applicable to the Work under the Agreement, or if no such fee has been agreed to by the parties, not more than five percent (5%) to the Subcontractor's prices for authorized extra work performed solely by Subcontractors. Such percentage will include all of Contractor's charges for overhead, profit, administration and supervision.
 - (iii) Contractor or Subcontractor will have the right to add the fee percentage applicable to Work under the Agreement for self-performed extra work, or if no such fee has been agreed to by the parties, Contractor's or Subcontractor's maximum total allowable additions for overhead, profit, administration and supervision will

not exceed ten percent (10%) of actual verifiable labor, materials and equipment for such self- performed extra work.

9.2.5 Any agreement which modifies the terms of the Agreement (including Change Orders) will be approved in writing by the Project Manager. Once properly executed by both parties, these modifications to the Agreement will have the same effect as if they had been included in the original Agreement.

9.3 **ACCURACY OF CHANGE ORDER PRICING INFORMATION**

9.3.1 Subject to Sections 9.3.2 through 9.3.4, signature by the contracting parties constitutes full accord and satisfaction between City and Contractor for all costs, damages, and expenses of whatever kind of nature, including delay, impact or acceleration damages, which may be occasioned by a Change Order of other modification of the Agreement agreed to in writing.

9.3.2 Accurate Change Order Pricing Information: Contractor agrees that it is responsible for submitting accurate cost and pricing data to City to support its Fixed Price, Unit Price, or Cost Plus Change Order Proposals or other Agreement Price adjustments under the Agreement. Contractor further agrees to submit Change Order proposals with cost and pricing data which is accurate, complete, current, and in accordance with the terms of the Agreement with respect to pricing of change orders. Contractor agrees that any “buy-out savings” on Change Orders will accrue 100% to Owner. “Buy-out savings” are defined as any savings negotiated by the Contractor with a Subcontractor or a Material Supplier after receiving approval of a Change Order amount that was designated to be paid to a specific Subcontractor or Supplier for the Approved Change Order work.

9.3.3 Right to Verify Change Order Pricing Information: Contractor agrees that City, through its designated representative, will have the right to examine, copy, and scan the records of the Contractor, Subcontractor or Sub-Subcontractor’s records (during the Agreement period and up to three years after final payment is made on the Agreement) to verify the accuracy and appropriateness of the pricing data used to price all Change Order proposals or claims. Contractor agrees that if City determines the cost and pricing data submitted (whether approved or not) was inaccurate, incomplete, not current, or not in compliance with the terms of the Agreement regarding pricing of Change Orders, an appropriate Agreement Price adjustment will be made. Such post-approval Contact Price adjustments will apply to all levels of contractors and Subcontractors and to all types of Change Order proposals, specifically including Fixed Price, Unit Price, and Cost Plus Change Orders.

9.3.4 Requirements for Detailed Change Order Pricing Information: Contractor agrees to provide a detailed breakdown of allowable labor and labor burden cost (i.e., base wage rate of applicable classifications of workers, payroll taxes, and insurance and benefits costs). This information will be used to evaluate the potential cost of labor and labor burden related to Change Order work. It is intended that this information represent an accurate estimate of the Contractor’s actual labor and labor burden cost components. Information is not intended to establish fixed billing or Change Order pricing labor rates. However, at the time Change Orders are priced, the submitted cost data for labor rates may be used to price Change Order work. The accuracy of any such agreed upon labor rate cost components used to price Change Orders will be subject to later audit. Approved Change Order amounts may be adjusted later to correct the impact of inaccurate labor cost components if the agreed upon labor cost components are determined to be inaccurate.

9.4 EMERGENCIES

In any emergency affecting the safety of persons or property, Contractor will act, at its discretion, to prevent threatened damage, injury or loss. Any change in the Agreement Price or Agreement Time resulting from emergency work will be determined as provided in this Section.

9.5 DIFFERING SITE CONDITIONS

- 9.5.1 If Differing Site Conditions are encountered at the Project Site, then notice by the observing party must be given to the other party promptly before conditions are disturbed (to the extent practicable) and in no event later than 14 Days after first observance of the conditions. City will promptly investigate such conditions and, if City determines that Differing Site Conditions exist and they materially cause an increase in the cost of, or time required for, performance of any part of the Work, Contractor will be entitled to equitable adjustment in the Agreement Price or Construction Schedule (and other time requirements), or both. If it is determined by City that the conditions at the Project Site are not Differing Site Conditions and no change is justified, then City will so notify Contractor in writing, stating the reasons. Claims in opposition to such determination must be made within 14 Days after City has given notice of its decision. If City and Contractor cannot agree on an adjustment in the Agreement Price or Construction Schedule (and other time requirements), the adjustment may be submitted to dispute resolution as provided these General Conditions.

9.6 CHANGES IN LAWS, REGULATIONS, OR LEGAL REQUIREMENTS OR TAXES

In the event of a material change in applicable Laws, Regulations, or Legal Requirements, or taxes subsequent to the date of the Agreement by the parties, Contractor may be entitled to a Change Order, in City's discretion, to the extent Contractor can document to the satisfaction of City that such change significantly increases Contractor's actual cost of performance of the Work.

SECTION 10 -SUSPENSION AND TERMINATION**10.1 SUSPENSION**

City may suspend the Agreement and Contractor's performance in accordance with MAG Specifications § 105.1 and 108.7.

10.2 TERMINATION BY THE CITY FOR CAUSE

- 10.2.1 MAG Specifications § 108.11 applies to the Agreement.

- 10.2.2 City may also terminate the Agreement if City determines, in its sole discretion that Contractor has:

- a. After prior written notice, refused or failed to supply enough properly skilled workers or proper materials;
- b. After prior written notice, failed to make payment to Subcontractors for materials or labor in accordance with the respective agreements between Contractor and the Subcontractors;
- c. After prior written notice, disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction;
- d. After prior written notice, repeatedly failed to comply with written directives from City;

- e. Is adjudged as bankrupt or insolvent;
- f. Made a general assignment for the benefit of creditors;
- g. Appointed a trustee or receiver for itself or any of its property;
- h. Filed a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or similar laws; or
- i. Otherwise breached a provision of the Agreement Documents or any other Agreement between City and Contractor.

10.2.3 When any of the above reasons exist, City may terminate the Agreement, without prejudice to any other rights or remedies of City, after giving Contractor and Contractors' surety, if any, 7 Days written notice of City's intent to terminate the Agreement and Contractor's failure to cure any such reasons. Upon such termination, City may: (1) take possession of the Site and of all materials thereon owned by Contractor; or (2) finish the Work by whatever reasonable method City may deem expedient. When City terminates the Agreement for one of the reasons state above, Contractor will not be entitled to receive further payment until the Work is finished. If the unpaid balance of the Agreement Price existing at the time of such termination exceeds the costs and expenses of finishing the Work and any other damages incurred by City, such excess will be paid to Contractor. If such costs, expenses and damages exceed such unpaid balance, Contractor must pay the difference to City. This obligation for payment will survive termination of the Agreement.

10.3 **TERMINATION BY CITY FOR CONVENIENCE**

City may also terminate the Agreement at any time for its convenience upon 7 Days written notice to Contractor specifying the termination date. In the event of termination which is not the fault, in whole or in part, of Contractor, City will pay to Contractor only such compensation, including reimbursable expenses, due for Work properly performed on the Project prior to the termination date. Upon any termination of the Agreement, no further payments will be due from City to Contractor.

10.4 **A.R.S. § 38-511**

The Agreement is subject to, and may be terminated by City in accordance with, the provisions of A.R.S. § 38-511.

SECTION 11 -INSURANCE AND BONDS

11.1 **INSURANCE REQUIREMENTS**

11.1.1 After Agreement award, the Contractor must furnish the City a certificate of insurance on a standard insurance industry ACORD form. The ACORD form must be issued by an insurance company authorized to transact business in the State of Arizona possessing a current A.M. Best, Inc. rating of A-7, or better and legally authorized to do business in the State of Arizona with policies and forms satisfactory to City. Provided, however, the A.M. Best rating requirement may not be deemed to apply to required Worker's Compensation coverage.

11.1.2 The Contractor and any of its Subcontractors must procure and maintain, until all of their obligations have been discharged, including any warranty periods under this Agreement are satisfied, the insurances set forth below.

11.1.3 The insurance requirements set forth below are minimum requirements for this Agreement and in no way limit the indemnity covenants contained in this Agreement.

General Conditions

- 11.1.4 The City in no way warrants that the minimum insurance limits contained in this Agreement are sufficient to protect Contractor from liabilities that might arise out of the performance of the Agreement services under this Agreement by Contractor, its agents, representatives, employees, or Subcontractors and the Contractor is free to purchase any additional insurance as may be determined necessary.
- 11.1.5 Failure to demand evidence of full compliance with the insurance requirements in this Agreement or failure to identify any insurance deficiency will not relieve the Contractor from, nor will it be considered a waiver of its obligation to maintain the required insurance at all times during the performance of this Agreement.
- 11.1.6 Use of Subcontractors: If any Work is subcontracted in any way, the Contractor must execute a written agreement with Subcontractor containing the same Indemnification Clause and Insurance Requirements as the City requires of the Contractor in this Agreement. The Contractor is responsible for executing the Agreement with the Subcontractor and obtaining Certificates of Insurance and verifying the insurance requirements.
- 11.2 **MINIMUM SCOPE AND LIMITS OF INSURANCE**
- 11.2.1 The Contractor must provide coverage with limits of liability not less than those stated below.
- 11.2.1.1 Commercial General Liability-Occurrence Form. Contractor must maintain "occurrence" form Commercial General Liability insurance with a limit of not less than \$2,000,000 for each occurrence, \$4,000,000 aggregate. Said insurance must also include coverage for products and completed operations, independent contractors, personal injury and advertising injury. If any Excess insurance is utilized to fulfill the requirements of this paragraph, the Excess insurance must be "follow form" equal or broader in coverage scope than underlying insurance.
- 11.2.1.2 Automobile Liability-Any Automobile or Owned, Hired and Non-Owned Vehicles. Contractor must maintain Business/Automobile Liability insurance with a limit of \$1,000,000 each accident on Contractor owned, hired, and non-owned vehicles assigned to or used in the performance under this Agreement. If any Excess or Umbrella insurance is utilized to fulfill the requirements of this paragraph, the Excess or Umbrella insurance must be "follow form" equal or broader in coverage scope than underlying insurance.
- 11.2.1.3 Workers Compensation and Employers Liability Insurance. Contractor must maintain Workers Compensation insurance to cover obligations imposed by federal and state statutes having jurisdiction of Contractor employees engaged in the performance of Work under this Agreement and must also maintain Employers' Liability insurance of not less than \$1,000,000 for each accident and \$1,000,000 disease for each employee.
- 11.2.1.4 Builders' Risk/Installation Floater Insurance. The Contractor bears all responsibility for loss to all equipment or Work under construction. Unless waived in writing by the City the Contractor will purchase and maintain in force Builders' Risk/Installation Floater insurance on the entire Work until completed and accepted by the City. This insurance will be Special Causes of Loss policy form, (minimally including perils of fire, flood, lightning, explosion, windstorm and hail, smoke, aircraft and vehicles, riot and civil commotion, theft, vandalism, malicious mischief, and collapse), completed value, replacement cost policy form equal to the Agreement Price and all subsequent modifications. The Contractor's Builders'

Risk/Installation Floater insurance must be primary and not contributory.

- a. Builders' Risk/Installation Floater insurance must cover the entire Work including reasonable compensation for architects and engineers' services and expenses and other "soft costs" made necessary by an insured loss. Builders' Risk/Installation Floater insurance must provide coverage from the time any covered property comes under the Contractor's control and or responsibility, and continue without interruption during course of construction, renovation and or installation, including any time during which any Project property or equipment is in transit, off Site, or while on Site for future use or installation. Insured property must include, but not be limited to, scaffolding, false work, and temporary buildings at the Site. This insurance must also cover the cost of removing debris, including demolition as may be legally required by operation of any law, ordinance, regulation or code.
- b. The Contractor must also purchase and maintain Boiler and Machinery insurance with the same requirements as Builders' Risk/Installation Floater insurance cited above if the Work to be performed involves any exposures or insurable property normally covered under a Boiler and Machinery insurance policy or made necessary as required by law or testing requirements in the performance of this Agreement. The Contractor will be responsible for any and all deductibles under these policies and the Contractor waives all rights of recovery and subrogation against the City under the Contractor- Builders' Risk/Installation Floater insurance described herein.
- c. Builders' Risk/Installation Floater Insurance must be maintained until whichever of the following first occurs: (i) final payment has been made; or, (ii) until no person or entity, other than the City, has an insurable interest in the property required to be covered.
- d. The Builders' Risk/Installation Floater insurance must be endorsed so that the insurance will not be canceled or lapse because of any partial use or occupancy by the City.
- e. The Builders Risk/Installation Floater insurance must include as named insureds, the City, the Contractor, and all tiers of Subcontractors and others with an insurable interest in the Work who will be named as additional insureds unless they are able to provide the same level of coverage with the City and Contractor named as additional insureds. Certificates must contain a provision that the insurance will not be canceled or materially altered without at least 30 Days advance notice to the City. The City must also be named as a Loss Payee under the Builders' Risk/Installation Floater coverage.
- f. The Builders Risk/Installation Floater insurance must be written using the Special Causes of Loss policy form, replacement cost basis.
- g. All rights of subrogation under the Builders Risk/Installation Floater insurance are, by this Agreement, waived against the City, its officers, officials, agents and employees.
- h. The Contractor is responsible for payment of all deductibles under the Builders' Risk/Installation Floater insurance policy.

11.2.1.5 Pollution Liability Insurance (Including Errors and Omissions). For Job Orders, Pollution Liability Insurance is only required if applicable and determined on a project specific basis. Contractor must maintain Pollution Liability Insurance with a limit of not less than \$5,000,000 per loss, \$5,000,000 aggregate for losses caused by pollution conditions including coverage for bodily injury, property damage, defense costs, clean-up costs, and completed operations that arise from the operations of Contractor as described in this Agreement.

- a. The policy must provide for complete professional service coverage, including coverage for pollution liability that is a result of a breach of professional duties.
- b. The policy must provide for protection again claims for third-party bodily injury, property damage, or environmental damage caused for pollution conditions resulting from general contracting activities for which Contractor is legally liable.
- c. The policy must provide for cleanup costs when mandated by governmental entities, when required by law, or as a result of third-party claims.
- d. Completed Operations Coverage must be kept in place for up to the statute of repose.
- e. The policy must be endorsed to include the following additional insured language: "City, its elected officials, trustees, employees, agents, and volunteers must be named as additional insureds with respect to liability arising out of the activities performed by, or on behalf of Contractor".
- f. If Work under this Agreement requires the transportation of any hazardous material or regulated substances, Contractor must carry Auto Liability with a CA 9948 endorsement or equivalent.
- g. If Work under this Agreement requires the disposal of any hazardous materials from the job site, Contractor must obtain a certificate of insurance for Pollution Legal Liability from the disposal site operator with a limit of not less than \$5,000,000 per loss, \$5,000,000 aggregate.

11.3 **ADDITIONAL POLICY PROVISIONS REQUIRED**

11.3.1 Self-Insured Retentions or Deductibles. Any self-insured retentions and deductibles must be declared and approved by the City. If not approved, the City may require that the insurer reduce or eliminate any deductible or self-insured retentions with respect to the City, its officers, officials, agents, employees, and volunteers.

11.3.2 The Contractor's insurance must contain broad form contractual liability coverage.

11.3.3 The Contractor's insurance coverage must be primary insurance with respect to the City, its officers, officials, agents, and employees. Any insurance or self-insurance maintained by the City, its officers, officials, agents, and employees will be in excess of the coverage provided by the Contractor and must not contribute to it.

11.3.4 The Contractor's insurance must 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.

11.3.5 Coverage provided by the Contractor must not be limited to the liability assumed under the

indemnification provisions of this Agreement.

- 11.3.6 The policies must contain a severability of interest clause and waiver of subrogation against the City, its officers, officials, agents, and employees, for losses arising from Work performed by the Contractor for the City.
- 11.3.7 The Contractor, its successors and or assigns, are required to maintain Commercial General Liability insurance as specified in this Agreement for a minimum period of 3 years following completion and acceptance of the Work. The Contractor must submit a Certificate of Insurance evidencing Commercial General Liability insurance during this 3 year period containing all the Agreement insurance requirements, including naming the required Additional Insureds set forth herein.
- 11.3.8 If a Certificate of Insurance is submitted as verification of coverage, the City will reasonably rely upon the Certificate of Insurance as evidence of coverage but this acceptance and reliance will not waive or alter in any way the insurance requirements or obligations of this Agreement.
- 11.3.9 Insurance Cancellation During Agreement Term.
- 11.3.9.1 If any of the required policies expire during the life of this Agreement, the Contractor must forward renewal or replacement Certificates to the City within 10 Days after the renewal date containing all the required insurance provisions.
- 11.3.9.2 Each insurance policy required by the insurance provisions of this Agreement must provide the required coverage and must not be suspended, voided or canceled except after 30 Days prior written notice has been given to the City, except when cancellation is for non-payment of premium, then 10 Days prior notice may be given. Such notice must be sent directly to Chandler Law-Risk Management Department, Post Office Box 4008, Mailstop 628, Chandler, Arizona 85225. If any insurance company refuses to provide the require notice, the Contractor or its insurance broker must notify the City of any cancellation, suspension, non-renewal of any insurance within 7 Days of receipt of insurers' notification to that effect.
- 11.3.10 City as Additional Insured. The above-referenced policies are to contain, or be endorsed to contain, the following provisions:
 - 11.3.10.1 The Commercial General Liability and Automobile Liability policies are to contain, or be endorsed to contain, the following provisions: The City, its officers, officials, agents, and employees are additional insureds with respect to liability arising out of activities performed by, or on behalf of, the Contractor including the City's general supervision of the Contractor; Products and Completed Operations of the Contractor; and automobiles owned, leased, hired, or borrowed by the Contractor.
 - 11.3.10.2 The City, its officers, officials, agents, and employees must be additional insureds to the full limits of liability purchased by the Contractor even if those limits of liability are in excess of those required by this Agreement.
- 11.4 **BONDS AND OTHER PERFORMANCE SECURITY**
- 11.4.1 After Agreement award, Contractor must provide a Performance Bond and a Payment Bond, each in an amount equal to the full amount of the Agreement Price.
- 11.4.2 Each such bond must be executed by a surety company or companies holding a Certificate

of Authority to transact surety business in the State of Arizona, issued by the Director of the Arizona Department of Insurance and must be named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. A copy of the Certificate of Authority must accompany the bonds. The Certificate must have been issued or updated within two (2) years prior to the execution of this Agreement. The bonds must be written or countersigned by an authorized representative of the surety who is either a resident of the state of Arizona or whose principal office is maintained in this state, as by law required.

- 11.4.3 The bonds must be made payable and be acceptable to City. The bond forms for the performance and payment bonds must be in the forms required under A.R.S. § 34-221, *et. Seq.*, as in Appendices 4 and 5 of these General Conditions.
- 11.4.4 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Agreement Documents, Contractor must promptly furnish a copy of the bonds or must permit a copy to be made.
- 11.4.5 All bonds submitted for this Project must be provided by a company which has been rated AM Best rating of A- or better for the prior four quarters by the latest edition of the 'Results Best's Key Rating Guide (Property/Casualty)' published by the A.M. Best Company.
- 11.4.6 Personal or individual bonds are not acceptable.
- 11.4.7 If the surety on any Bond furnished by Contractor is declared a bankrupt or becomes insolvent, or Contractor's right to do business is terminated in any state where any part of the Project is located, or it ceases to meet the requirements of this Section 11.4, Contractor must within 5 Days thereafter substitute another Bond and surety, both of which must be acceptable to City.

SECTION 12 - INDEMNIFICATION

- 12.1 To the extent permitted by law, the Contractor and its owners, officers, directors, agents, employees, and subconsultants (collectively "Indemnitor") must indemnify, save, and hold harmless the City and its officers, officials, agents, and employees (collectively "Indemnatee") from any and all claims, actions, liabilities, damages, losses, or expenses (including court costs, attorneys' fees, and costs of claim processing, investigation, and litigation) (collectively "Claims") caused or alleged to be caused, in whole or in part, by the negligent, reckless, wrongful, or willful acts, errors, or omissions of Indemnitor in connection with this Agreement. This indemnity includes any Claim or amount arising out of or recovered under workers' compensation laws or on account of Indemnitor's failure to conform to any federal, state, or local law, statute, ordinance, rule, regulation, or court decree. Indemnitor must indemnify Indemnatee from and against any and all Claims, except those arising solely from Indemnatee's own negligent, reckless, wrongful, or willful acts, errors, or omissions. Indemnitor is responsible for primary loss investigation, defense, and judgment costs where this indemnification applies. In consideration of the award of this Agreement, Indemnitor agrees to waive all rights of subrogation against Indemnatee for losses arising from or related to this Agreement. Indemnitor's obligations under this provision survive the termination or expiration of this Agreement.

SECTION 13 -DISPUTE RESOLUTION

General Conditions

- 13.1 All disputes arising out of or relating to the Agreement, the Work or the Project, other than termination under Section 10, will be resolved pursuant to the Dispute Resolution process set forth in Appendix 6 of these General Conditions, and not pursuant to MAG Specifications § 110.
- 13.2 Contractor agrees that during any dispute between the parties, Contractor will continue to perform its obligations under the Agreement until such dispute is resolved.
- 13.3 Notwithstanding any other provision in this Agreement, City has the right to immediately file in court and pursue an action for a temporary restraining order and injunctive relief against Contractor if City determines that such action is necessary to protect its interests under the Agreement, to obtain specific performance of any provision of the Agreement, to advance the completion of the Project, or to protect health, welfare and safety.

SECTION 14 - MISCELLANEOUS PROVISIONS**14.1 AGREEMENT DOCUMENTS**

- 14.1.1 The Agreement Documents are intended to permit the parties to complete the Work and all obligations required by the Agreement Documents within the Agreement Times for the Agreement Price. The Agreement Documents are intended to be complementary and interpreted in harmony so as to avoid conflict, with words and phrases interpreted in a manner consistent with construction and design industry standards.
- 14.1.2 It is the intent of the Agreement Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Agreement Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Agreement Documents or from prevailing custom or trade usage as being required to produce the intended result must be provided by Contractor whether or not specifically called for at no additional cost to City.
- 14.1.3 The Agreement Documents establish the rights and obligations of the parties and include the Agreement, Addenda (which pertain to the Agreement Documents), Contractor's Bid or Proposal (including documentation accompanying the Bid and any post-Bid documentation submitted prior to Agreement award) when attached as an exhibit to the Agreement, the accepted Project Schedule, the Notice to Proceed, the Performance Bond, the Payment Bond, Project Design, Engineering and Specifications, these General Conditions, the Project Specific Special Provisions, Technical Specifications, Agreement Drawings, as the same may be more specifically identified in the Agreement, Change Orders, Work Change Directives, Field Orders and the written interpretations and clarifications of the Design Professional or City representative and Modifications issued after execution of the Agreement. Approved Shop Drawings and the reports and drawings of subsurface and physical conditions are not Agreement Documents.
- 14.1.4 In the event of any inconsistency, conflict, or ambiguity between or among the Agreement Documents, the Agreement Documents will take precedence as follows from highest to lowest: Change Orders, Addenda, Agreement, Project Specific Special Provisions, General Conditions, Technical Specifications, Drawings/Plans, Chandler Amendments to MAG Standard Specifications and Chandler Standard Details, and MAG Uniform Standard Specifications and Details for Public Works Construction. If applicable to this Agreement, Federal Provisions prevail.

General Conditions

- 14.1.5 On the Drawings, given dimensions will take precedence over scaled measurements and large scale drawings over small-scale drawings.
- 14.1.6 Clarifications and interpretations of the Agreement Documents will be issued by the Design Professional through the City.
- 14.1.7 The headings used in this Agreement or any other Agreement Documents, are for ease of reference only and must not in any way be construed to limit or alter the meaning of any provision.
- 14.1.8 The Agreement Documents form the entire agreement between City and Contractor. No oral representations or other agreements have been made by the parties except as specifically stated in the Agreement Documents.
- 14.1.9 The Agreement Documents may not be changed, altered, or amended in any way except in writing signed by a duly authorized representative of each party in the form of a Change Order.
- 14.1.10 Re-Use of Documents. Neither Contractor nor any Subcontractor, manufacturer, fabricator, supplier or distributor will have or acquire any title to or ownership rights in any of the Drawings, Specifications or other documents (or copies of any thereof) prepared by or bearing the seal of the Design Professional; and they must not re-use any of them on extensions of the Project or any other project without written consent of City and the Design Professional and specific written verification or adaptation by the Design Professional.
- 14.2 **REFERENCE STANDARDS**
- 14.2.1 Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, will mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Agreement Documents.
- 14.2.2 The provisions of any such standard, specification, manual or code, or any instruction of a Supplier will not change the duties or responsibilities of City, Contractor, Design Professional or Project Manager, or any of their Subcontractors, consultants, agents, or employees from those set forth in the Agreement Documents, nor will any such provision or instruction assign to City, Contractor, Design Professional, or any of their agents, or employees any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Agreement Documents.
- 14.3 **COMPLIANCE WITH ARIZONA LAW AND FEDERAL LAW**
- 14.3.1 Compliance with A.R.S. § 41-4401. Pursuant to the provisions of A.R.S. § 41-4401, the Contractor hereby warrants to the City that the Contractor and each of its subcontractors ("Subcontractors") must comply with all Federal Immigration laws and regulations that relate to the immigration status of their employees and the requirement to use E-Verify set forth in A.R.S. §23-214(A).
- 14.3.2 A breach of the Contractor Immigration Warranty constitutes a material breach of this Agreement and subject to penalties up to and including termination of this Agreement.
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General Conditions

14.3.3 The City retains the legal right to inspect the papers of any Contractor or Subcontractor employee who works on this Agreement to ensure that the Contractor or Subcontractor is complying with the Contractor Immigration Warranty. The Contractor agrees to assist the City in the conduct of any such inspections.

14.3.4 The City may, at its sole discretion, conduct random verifications of the employment records of the Contractor and any Subcontractors to ensure compliance with Contractors Immigration Warranty. The Contractor agrees to assist the City in performing any such random verifications.

14.3.5 The provisions of this Article must be included in any agreement the Contractor enters into with any and all of its subcontractors who provide services under this Agreement or any subcontract. "Services" are defined as furnishing labor, time or effort in the State of Arizona by a contractor or subcontractor. Services include construction or maintenance of any structure, building or transportation facility or improvement to real property.

14.4 **HAZARDOUS ENVIRONMENTAL CONDITIONS**

14.4.1 Contractor will not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Agreement Document to be within the scope of the Work. Contractor will be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

14.4.2 If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition. Contractor must immediately:

- a. Secure or otherwise isolate such condition;
- b. Stop all Work in connection with such condition and in any area affected thereby; and
- c. Notify City and promptly thereafter confirm such notice in writing.

14.4.3 City will promptly retain a qualified expert to evaluate such condition or take corrective action, if any.

14.4.4 Contractor will be responsible for any and all civil or criminal penalties, fines, damages, or other charges imposed by any regulatory agency or court for sewage discharges that are in violation of applicable statutes and laws and that are a result, direct or indirect, of work performed under this Agreement. Contractor will also be responsible for reimbursement to City for administration, reporting, and tracking expenses required as a result of any spill event. In the event the regulatory agency or court imposes a probationary period, Contractor must post bond for the probationary period to ensure that all such costs are reimbursed to City. This responsibility will apply whether penalties are imposed directly on Contractor or any of its Subcontractors, or the City of Chandler. Contractor must defend and indemnify City against such penalties. Regulatory agencies may include, but are not limited to, the Arizona Department of Environmental Quality (ADEQ) and the United States Environmental Protection Agency (USEPA).

14.5 **COOPERATION AND FURTHER DOCUMENTATION**

Contractor agrees to provide City such other duly executed documents as may be reasonably requested by City to implement the intent of the Agreement Documents.

14.6 **ASSIGNMENT**

Neither Contractor nor City will, without the written consent of the other assign, transfer or sublet any portion of this Agreement or part of the Work or the obligations required by the Agreement Documents, any such assignment will be void, will transfer no rights to the purported assignee, and would be a material breach of the Agreement.

14.7 **SUCCESSORS**

Contractor and City intend that the provisions of the Agreement Documents are binding upon the parties, their employees, agents, heirs, successors and assigns.

14.8 **LAWFUL PRESENCE**

Pursuant to A.R.S. §§ 1-501 and 1-502, City is prohibited from awarding an agreement to any natural person who cannot establish that such person is lawfully present in the United States. To establish lawful presence, a person must produce qualifying identification and sign a City-provided affidavit affirming the identification provided is genuine. This requirement will be imposed at the time of agreement award. This requirement does not apply to business organizations such as corporations, partnerships, or limited liability companies.

14.9 **NO BOYCOTT OF ISRAEL CERTIFICATION**

By Contractor's signature on this Agreement, Contractor certifies under A.R.S. § 35-393.01 that Contractor is not currently engaged in and for the duration of this Agreement will not engage in a boycott of Israel.

14.10 **NO THIRD PARTY BENEFICIARY**

Nothing under the Agreement Documents will be construed to give any rights or benefits in the Agreement Documents to anyone other than City and Contractor, and all duties and responsibilities undertaken pursuant to the Agreement Documents will be for the sole and exclusive benefit of City and Contractor and not for the benefit of any other party, unless otherwise expressly set forth in the Agreement Documents.

14.11 **GOVERNING LAW AND VENUE**

The Agreement and all Agreement Documents will be deemed to be made under, and will 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. Any court action to enforce any provision of the Agreement or to obtain any remedy with respect hereto must be brought in the Superior Court, Maricopa County, Arizona, and for this purpose, each party hereby expressly and irrevocably consents to the jurisdiction and venue of such Court.

14.12 **SEVERABILITY**

If any provision of the Agreement Documents or the application thereof to any person or circumstance will be invalid, illegal or unenforceable to any extent, the remainder of the affected provision, the remainder of the Agreement Documents, and the application thereof will not be affected and will be enforceable to the fullest extent permitted by law.

14.13 **LEGAL REQUIREMENTS**

At all times relevant to its entry into this Agreement and performance of the Services and the Work, Contractor must fully comply with all Laws, Regulations, or Legal Requirements applicable to City, the Project, and the Agreement, including, without limitation, those set

forth on Exhibit C of the Agreement.

14.14 **PARTIAL INVALIDITY**

If any provision of the Agreement is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions will nevertheless continue in full force without being impaired or invalidated in any way.

14.15 **ATTORNEYS' FEES**

Should either party to the Agreement bring an action to enforce any provision of the Agreement, the prevailing party will be entitled to recover reasonable attorneys' fees and costs in connection therewith.

14.16 **CONFLICT OF INTEREST**

14.16.1 Contractor agrees to disclose any financial or economic interest with the Project property, or any property affected by the Project, existing prior to the execution of the Agreement. Further, Contractor agrees to disclose any financial or economic interest with the Project property, or any property affected by the Project, if Contractor gains such interest during the course of this Agreement. If Contractor gains financial or economic interest in the Project during the course of this Agreement, this may be grounds for terminating this Agreement. Any decision to terminate the Agreement must be at the sole discretion of City.

14.16.2 Contractor will not engage the services on this Agreement of any present City employee who was involved as a decision maker in the selection or approval processes, or who negotiated or approved billings or Agreement Modifications for this Agreement.

14.16.3 Contractor agrees that it will not perform services on this Project for a contractor, subcontractor, or any supplier, not covered under this Agreement.

14.17 **INDEPENDENT CONTRACTOR**

Contractor is and must be an independent contractor. Any provisions in the Agreement Documents that may appear to give City the right to direct Contractor as to the details of accomplishing the Work or to exercise a measure of control over the Work means that Contractor must follow the wishes of City as the results of the Work only. These results must comply with all applicable laws and ordinances.

14.18 **NOTICE OF INJURY**

Should City or Contractor suffer injury or damage to their person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim must be made in writing to the other party within 7 Days of the first observance of such injury or damage.

14.19 **CONFIDENTIALITY**

Contractor, for the benefit of City, hereby agrees it will not release or cause or permit to be released to the public any press notices, publicity (oral or written) or advertising promotion relating to, any statement regarding, or any other public announcement or disclosure or cause or permit to be publicly announced or disclosed, in any manner whatsoever, the specific terms and conditions of this Agreement or any comment relating to the Project or the Site. Notwithstanding the foregoing, Contractor will be entitled to disclose the terms of the Agreement to the extent required by law or in the course of enforcing or defending a claim or action hereunder. Contractor must give City reasonably prompt notice of any disclosure or statement made pursuant to this provision.

14.20 DATA CONFIDENTIALITY

- 14.20.1 As used in the Agreement, "data" means all information, whether written or verbal, including plans, specifications, renderings, 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, obtained by, or transmitted to the City in the performance of this Agreement.
- 14.20.2 Contractor agrees that all data, regardless of form, including originals, images, and reproductions, prepared by, obtained by, or transmitted to City in connection with the Contractor's performance of this Agreement is confidential and proprietary information belonging to City.
- 14.20.3 Except as specifically provided in this Agreement, Contractor or its Subcontractors must not divulge data to any third party without prior written consent of City. Contractor or its Subcontractors must not use data for any purposes except to perform Work required under this Agreement. These prohibitions will not apply to the following data provided Contractor has first given the required notice to City:
- a. Data which was known to Contractor or its Subcontractors prior to its performance under this Agreement unless such data was acquired in connection with Work performed for City;
 - b. Data which was acquired by Contractor or its Subcontractors in its performance under this Agreement and which was disclosed to Contractor or its Subcontractors by a third party, who to the best of Contractor's or its Subcontractor's knowledge and belief, had the legal right to make such disclosure and Contractor or its Subcontractors are not otherwise required to hold such data in confidence; or
 - c. Data which is required to be disclosed by virtue of law, regulation, or court order, to which the Contractor or its Subcontractors are subject.
- 14.20.4 In the event the Contractor or its Subcontractors are required or requested to disclose data to a third party, or any other information to which the Contractor or its Subcontractors became privy as a result of any other agreement with City, the Contractor must first notify City as set forth in this Section of the request or demand for the data. The Contractor or its Subcontractors must give City sufficient facts so that City can be given an opportunity to first give its consent or take such action that City may deem appropriate to protect such data or other information from disclosure.
- 14.20.5 Unless prohibited by law, within 10 Days after completion of services for a third party on real or personal property owned or leased by City, the Contractor must promptly deliver, as set forth in this Section, a copy of all data to City. All data will continue to be subject to the confidentiality agreements of this Agreement.
- 14.20.6 Contractor or its Subcontractors assume all liability for maintaining the confidentiality of the data in its possession and agree to compensate City if any of the provisions of this Section are violated by Contractor, its employees, agents, or Subcontractors. Solely for the purposes of seeking injunctive relief, it is agreed that a breach of this Section will be deemed to cause irreparable harm that justified injunctive relief in court. Contractor agrees that the requirements of this Section will be incorporated into all subcontracts entered into by Contractor. A violation of this Section may result in immediate termination of this

Agreement without notice.

14.21 **SURVIVAL**

All warranties, representations and indemnifications by Contractor must survive the completion or termination of this Agreement.

14.22 **COVENANTS AGAINST CONTINGENT FEES**

Contractor 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 City Council, or any employee of City has any interest, financially, or otherwise, in the firm. For breach or violation of this warrant, City will have the right to annul the Agreement without liability or at its discretion to deduct from the Agreement Price or consideration, the full amount of such commission, percentage, brokerage, or contingent fee.

14.23 **NO WAIVER**

The failure of either party to enforce any of the provisions of the Agreement Documents or to require performance of the other party of any of the provisions hereof must not be construed to be a waiver of such provisions, nor will it affect the validity of the Agreement Documents or any part thereof, or the right of either party to thereafter enforce each and every provision.

14.24 **NONEXCLUSIVE REMEDIES**

The remedies set forth in this Agreement are cumulative and not exclusive, and failure to exercise any remedy (including, without limitation, any right to terminate) will not preclude any party from exercising any other right in seeking any other remedy available to it at law or in equity.

14.25 **PROJECT COMMUNICATIONS**

14.25.1 All communications concerning the performance of the Work or the Project will be provided to the designated Project Manager and Contractor's Representative set forth in Article 1 of the Agreement. City may change the designated Project Manager and, subject to Section 4.4.20 of these General Conditions, Contractor may change Contractor Representative, by written notice to the other.

14.25.2 Project communications may be exchanged by e-mail, but email communications cannot change the terms of the Agreement or the Scope of Work, or effectuate any change that requires a written Change Order.

14.25.3 When any provisions of the Agreement Documents requires Contractor or the Design Professional to give written notice to City, it will be deemed to have been validly given if delivered in person or if delivered at or sent by registered or certified mail, postage prepaid, to the Parties indicated in Agreement Article 1, incorporated by reference.

14.25.4 When any provisions of the Agreement Documents requires City, Project Manager, or the Design Professional to give written notice to Contractor, it will be deemed to have been validly given if delivered in person to the person designated in the Agreement Documents as Contractor's Resident Superintendent, or if delivered at or sent by registered or certified mail, postage prepaid, to Contractor at the last address in the Agreement Documents or such substitute address which Contractor designates in writing, or to the business address known to the giver of notice.

General Conditions

14.26 DRUG FREE WORKPLACE PROGRAM

- 14.26.1 City has adopted a policy establishing a drug free workplace for itself and as a requirement for Contractors doing business with City, to ensure the safety and health of employees working on City projects.
- 14.26.2 Contractor must require a drug free workplace for all employees working under the Agreement. Specifically, all employees of Contractor who are working under an agreement with City must be notified, in writing, by Contractor that they are prohibited from the manufacture, distribution, dispensation, possession or unlawful use of a controlled substance in the workplace.
- 14.27 Failure to require a drug free workplace in accordance with the City's policy may result in termination of the Agreement and possible debarment from bidding on future City projects.

SECTION 15 - PROVISIONS APPLICABLE SOLELY TO GMP AND COST-BASED AGREEMENTS, CHANGE ORDERS, AND JOB ORDERS

15.1 ADDITIONAL DEFINITIONS

The definitions set forth in Section 2 apply to GMP and Cost-Based Agreements, Change Orders, and Job Orders, together with the additional definitions set forth below.

Baseline Cost Model –

A breakdown and estimate of the scope of the Project developed by CM@Risk pursuant to Section 17.5 of these General Conditions.

CM@Risk or Construction Manager at Risk –

The person or firm selected by City to provide pre-construction and/or construction services as detailed in a Construction Manager at Risk Agreement with City. In these General Conditions, the term "Contractor" includes CM@Risk under both Pre-Construction and Construction Services Agreements.

CM@Risk Fee or Contractor's Fee –

An agreed to percentage in an accepted GMP that represents the Contractor's fee for performance of the Work.

Agreement Documents –

Where compensation under the Agreement is based upon a GMP accepted by City, the term "Agreement Documents" also includes the accepted GMP Proposal.

Agreement Price –

Where compensation under the Agreement based upon a GMP accepted by City, the term "Agreement Price" refers to the GMP.

Cost-Based Agreement, Change Order, or Job Order –

A Agreement, Change Order, or Job Order where the Agreement Price is based upon the actual cost of performing the Work, subject to the terms of the Agreement Documents, including this Section 15. These would include those generally referred to as "Cost of the Work plus a Fee with a GMP," "Time and Materials," or "Cost Plus a Fee."

Cost of the Work –

The direct costs necessarily incurred by Contractor in the proper, timely, and complete performance on the Work. The Cost of the Work will include only those costs set forth in Section 15.2 of these

General Conditions

General Conditions.Deliverables –

The work products prepared by Contractor in performing the scope of work described in the Agreement. Some of the major deliverables to be prepared and provided by Contractor during pre-construction may include but are not limited to: the Baseline Cost Model and Schedule that validate City's plan and budget, Construction Management Plan, Detailed Project Schedule, Schedule of Values, alternative system evaluations, procurement strategies and plans, Detailed Cost Estimates, construction market surveys, cash flow projections, GMP Proposals, Subcontractor procurement plan, Subcontractor agreements, Subcontractor bid packages, Supplier agreements, Constructability Review, Cost Control Log, Traffic control and phasing plans and others as indicated in this Agreement or required by the Project Team.

Pre-Construction Services Agreement –

The Agreement entered into between City and the CM@Risk for Pre-Construction Services to be provided by the CM@Risk, including, without limitation, the generation of a GMP Proposal. If the GMP Proposal is accepted by City and a Construction Agreement is entered into between City and CM@Risk, the duties, obligations and warranties of the CM@Risk under the Pre-Construction Services Agreement survive and are incorporated into the resulting Construction Agreement.

Pre-Construction Services –

The services to be provided under the Pre-Construction Services Agreement, including Section 17 of these General Conditions.

Detailed Project Schedule –

The Detailed Project Schedule developed by the CM@Risk for the review and approval of the Project Manager in accordance with Section 17.3 of these General Conditions, if applicable.

General Conditions Costs –

Those costs set forth in Section 4 of Appendix 9 to these General Conditions.

GMP Plans and Specifications –

The plan and specifications upon which the Guaranteed Maximum price Proposal is based.

GMP Proposal –

The proposal of Contractor submitted pursuant to Section 17.7 of these General Conditions for the entire Work and/or portion (phases) of the Work.

Guaranteed Maximum Price or GMP –

The Guaranteed Maximum Price set forth in the Agreement, Change Order, or Job Order if applicable.

15.2 AGREEMENT PRICE

15.2.1 The Agreement Price for all Agreements, Change Orders, and Job Orders based upon payment of the Cost of the Work plus a Fee with a GMP, time and materials, or cost-plus a fee will be the Cost of the Work incurred plus the Fee agreed to in writing by City, limited to the amount of the GMP, if agreed to. Unless otherwise expressly provided in the Agreement, Change Order, or Job Order, all Cost Based pricing will be subject to and limited to GMP.

15.2.2 The Agreement Price may only be changed as set forth in Section 9 above.

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15.2.3 Only costs specifically designated as reimbursable costs are eligible for payment by City or may be charged against the Agreement Price. All other costs will not be paid by City and will not be chargeable against the Agreement Price.

15.2.4 Cost-Based Agreements. For Agreements, Change Orders, or Job Orders, reimbursable costs must be determined pursuant to Appendix 9 to these General Conditions, Cost of the Work, and not by MAG Specifications §109.5.

15.3 **ALLOWANCES**

15.3.1 Contractor must include in the Agreement Price all Allowances stated in the Agreement Documents and agreed to in writing by City. Items covered by these Allowances must be supplied for such amounts and by such persons as City may direct, provided Contractor will not be required to employ persons against whom Contractor makes a reasonable objection. Materials, labor, and equipment under an Allowance will be selected by City in accordance with a schedule to be mutually agreed upon by City, Design Professional and Contractor or otherwise in reasonably sufficient time to avoid delay in the Work.

15.3.2 Unless otherwise provided in the Agreement Documents:

15.3.2.1 These Allowances must cover the cost to Contractor, less any applicable trade discount, of the materials, labor, and equipment required by the Allowances, delivered at the Site, and all applicable taxes;

15.3.2.2 Contractor's costs for unloading and handling on the Site, labor, installation costs, overhead, profit and other expenses relating to materials, labor, and equipment required by the Allowance must be included in the Agreement Sum and not in the Allowance; and

15.3.2.3 Whenever the cost is more or less than the Allowance, the Agreement Sum must be adjusted accordingly by Change Order, the amount of which will recognize the difference between actual costs for an Allowance item and the amount of the Allowance item and changes, if any, in handling costs on the Site, labor, installation costs, overhead, profit and other expenses.

15.4 **CONTINGENCY**

An agreed to amount in the GMP that may only be used in accordance with the terms set forth in these General Conditions and with prior written approval by the City.

15.4.1 Construction Contingency. This GMP includes a dollar amount listed as a Construction Contingency which will be readily available for increased costs for subcontractors, material, and equipment subject to prior approval of City, which approval will not be withheld unreasonably. The Construction Contingency may also be used, at the discretion of City, to reimburse CM@Risk for unexpected costs due to (a) scope gaps between trade subcontractors; (b) agreement default by trade subcontractors; (c) unforeseen field conditions, but only as defined in Section 9.5 above; (d) work completed to meet the intent of the design, but which was not indicated on the plans; (e) costs overruns not covered by allowances; (f) costs of corrective work not provided for elsewhere; and (g) implementation of any Recovery Plan. Cost for which CM@Risk desires to be paid from the Construction Contingency must be documented by CM@Risk on a time and materials basis and are subject to verification by City. If agreed to by City, a "Use of Contingency" form will be executed by both parties authorizing the actual cost of the work to be paid and included in the Work Item Direct Costs. The Construction Contingency is not allocated to any particular

item of the Project but may be used for any portion of the work as determined above. Any amount not used in the Construction Contingency will belong to City and will reduce the GMP.

- 15.4.2 **Owner's Contingency.** This GMP also includes a dollar amount listed as an Owner's Contingency which may be used only by the City (owner department) for upgrades and changes in scope or other changes not already included within the intent of the Project Program. City will provide CM@Risk with a Work Change Directive authorizing CM@Risk to perform the additional work and to transfer funds from the Owner's Contingency to the Work Item Direct Costs category to be paid with such direct costs. These additional costs will be in an amount mutually agreed upon by CM@Risk and City or will be documented by CM@Risk on a time and materials basis and are subject to verification by City. Any amount not used in the Owner's Contingency will belong to the City and will reduce the GMP.

15.5 **REDUCTION IN RETENTION**

If the Agreement Price is based upon a GMP, in order to receive payment of one-half of the retention as set forth in Section 8.1.5 above, Contractor must also submit to the Project Manager a complete accounting of the Actual Reimbursable Cost of the Work to date, including all such documentation (including, without limitation, invoices, subcontract, subcontractor change orders, purchase orders, records of payment, etc.) as City may require, to establish whether the payments made to Contractor equal, exceed, or are less than the actual reimbursable Cost of the Work to date. Any excess payments by City, as determined by the Project Manager, will be deducted from the one-half retention payment to be made to Contractor, and any additional excess amounts paid to Contractor will be refunded by Contractor to City. The Project Manager's determinations as to Actual Reimbursable Cost of the Work will be the basis of payment until final Project Closeout and Final Payment under the Agreement.

15.6 **FINAL PAYMENT**

If the Agreement Price is based upon a GMP, as a further condition precedent to Final Payment by City, Contractor must submit to the Project Manager a complete final accounting of the Actual Reimbursable Cost of the Work, including all such documentation (including, without limitation, invoices, subcontracts, subcontractor change orders, purchase orders, records of payment, etc.) as City may require, to establish whether the payments made to Contractor equal, exceed, or are less than the Actual Reimbursable Cost of the Work to date. Any excess payments by City, as determined by the Project Manager, will be deducted from the one-half retention payment to be made to Contractor, and any additional excess amounts paid to Contractor will be refunded by Contractor to City. Disputes relating to the Final Cost of the Work will be subject to City's audit rights under Sections 8.8 above and 15.7 below, and the dispute resolution process under Section 13 above.

15.7 **OPEN BOOK**

On any GMP-based or Cost-Based Agreement, Job Order, or Change Order, City may attend any and all meetings or discussions pertaining to the Project, including bid openings, and must have access to all books, invoices, accounts, memoranda, correspondence, and written communications or records of any kind pertaining to the Project, including without limitation, those stored in electronic format.

15.8 **DIFFERING SITE CONDITIONS AND/OR CHANGE IN LAWS**

A Change Order for increased costs under Section 9.5 or 9.6 above will only be considered

or granted by City to the extent such actual, documented costs are justified.

SECTION 16 - PROVISIONS APPLICABLE SOLELY TO JOB ORDER AGREEMENTS (JOC)

16.1 ADDITIONAL DEFINITIONS

The definitions set forth in Sections 2 and below will apply to all Job Order Agreements and Job Orders. In addition, the definitions set forth in Section 15.1 above will apply to all Cost-Based Job Orders.

Agreement –

Includes the Job Order Master Agreement and Job Order Project Agreements issued and agreed to by City and JOC Contractor.

JOC Contractor's Coefficient –

A numerical factor that represents JOC Contractor total costs (indirect and direct costs, sales tax, profit, etc.) and other adjustments for market conditions.

Job Order Request for Proposal (RFP) –

The Request for Proposals issued by City for each Job Order Project Agreement relating to a specific Project.

Job Order Cost Proposal –

The Proposal submitted by JOC Contractor in response to a Job Order Request for Proposal (RFP) issued by City to develop a Job Order Project Agreement for a specific Project.

Guaranteed Maximum Price (GMP) Job Order –

Job Order under which JOC Contractor is compensated for actual costs incurred.

Job Order Project Agreement (Job Order) –

The agreement for a specific project, as it may be modified by all Change Orders, executed by the Parties, which incorporates the terms and conditions of the Job Order Master Agreement.

16.2 ORDERING AND PROCESSING PROCEDURES FOR JOB ORDERS

16.2.1 The process for developing and issuing a Job Order for a particular Project consists of three (3) procedures: (1) issuance of a RFP by City; (2) JOC Contractor's response to the RFP in the form of JOC Contractor's Job Order Cost Proposal; and (3) Issuance of a Job Order by City, as set for below.

16.2.2 RFP's For Job Orders

16.2.2.1 City will provide to JOC Contractor RFP with a Scope of Work (SOW) describing the Work to be performed, which may include special instructions and conditions, material submittal requirements, and, if applicable, a complete set of sketches, construction drawings and specifications for the Job Order.

16.2.2.2 Some Job Order RFP's will be issued by City without detailed sketches, drawing and specifications and will rely on JOC Contractor to produce them for City review and approval and is considered to be Pre-Construction and incidental design services included in JOC Contractor's overhead for GMP Job Orders. In addition JOC Contractor will not be reimbursed for any Pre-Job Order costs, including proposal preparation, attendance during negotiations, or site visits.

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16.2.3 JOC Contractor's Job Order Cost Proposal

16.2.3.1 JOC Contractor must respond within ten (10) calendar days of the RFP date or site visit, whichever is later or as otherwise indicated on a case-by-case basis, by submitting JOC Contractor's Job Order Cost Proposal to the City representative.

16.2.3.2 Unless otherwise required under the terms of the RFP, JOC Contractor's Job Order Cost Proposal must include the following.

- a. JOC Contractor's Job Order Cost Proposal in PDF and electronic format;
- b. A Project Schedule and schedule of values that reflects the costs of each work element on the schedule. The schedule must show all milestones (e.g., permits, submittals, ordering materials, demolition, work phases, closeout and completion date); and
- c. Necessary documentation will be required to indicate that adequate scoping, layout, setup and planning to accomplish the Work has been done. Examples of documentation that might reasonably be expected include sketches, drawings, calculations, catalog cuts and specifications produced to a level of detail and skill that could be expected of experienced, competent Project Managers with five or more periods experience in their respective trade.

16.2.3.3 JOC Contractor must select Subcontractors based on qualifications alone or on a combination of qualifications and price and must not select Subcontractors based on price alone. A qualifications and price selection may be a one-step selection based on a combination of qualifications and price or two-step selection. In a two-step selection, the first step must be based on qualifications alone and the second step may be based on a combination of qualifications and price or on price alone.

16.2.3.4 Upon request, JOC Contractor must provide City with copies of Subcontractor quotes and the basis for selection of each Subcontractor.

16.2.3.5 If City objects to a selected Subcontractor, City will make the objection and the reasons for the objection known to the JOC Contractor. JOC Contractor must then present an acceptable Subcontractor for the applicable discipline. City will not unreasonably object to or withhold approval of a Subcontractor.

16.2.3.6 For self-performed work, the City retains the right to have the JOC Contractor establish JOC Contractor's costs by bidding their costs against at least three (3) other interested trade Contractors. No self-performed work will be allowed to be performed on a lump sum basis.

16.2.4 Issuance of Job Order

16.2.4.1 City Representative will compare the JOC Contractor's Job Order Cost Proposal with the City's estimate, schedules and other requirements, and then, if the City Representative determines it is in the best interest of City, arrange a meeting with JOC Contractor, at which time the JOC Contractor's Job Order Cost Proposal will be discussed and negotiated.

16.2.4.2 If the City Representative determines that it is in the best interest of the City, City will then issue a Job Order to JOC Contractor for execution.

16.2.4.3 Specific Job Orders may vary, but unless agreed to by City in writing otherwise, the content

of Job Orders under the Agreement will generally be as follow, all of which will be signed and/or initialed by JOC Contractor's designated representative:

- a. The description of the Scope of the Work and Project Schedule (attached as Exhibit A to the Job Order);
- b. The address or location of the Work;
- c. The Agreement Price for Work (Construction) included in the Project (attached as Exhibit B to the Job Order);
- d. The name of the JOC Contractor representative for the Project;
- e. The Drawings and Specifications for the Project;
- f. If any shop drawings, project date and/or samples are required for the Job Order, the date for delivery of each required item (included in the Project Schedule, Exhibit A to the Job order); and
- g. Project Specific Provisions, if any, in Exhibit A to the Job Order, including, without limitation, whether any of the following are required: Pre-Construction Conference, weekly progress meetings, field office, storage enclosure, materials and equipment handling facility, submittals, shop drawings, product data, equipment list, samples, project manual, schedule of values, Construction progress schedule, narrative reports, progress report, progress charts, progress photographs, materials status report, Construction diagram, Construction status report, operation and maintenance data, operating maintenance instructions and parts list, and as-build drawings.

16.2.5 Job Order Intent. Each Job Order will be interpreted to include all items reasonably necessary to complete the Project under that Job Order as described in the scope of the Work in that Job Order. All Work must be performed in a professional manner and all materials used must be new and of the highest quality and of the type best adapted to their purpose, unless otherwise specified. The Notice to Proceed date, and the award date established therein, will be deemed an integral part of the Job Order the same as if set forth therein.

16.3 **INCIDENTAL DESIGN SERVICES**

16.3.1 This effort includes all "extensions of design" for systems that are typically specified in a performance oriented manner by consultants and designers. Examples include: fire sprinkler systems, fire alarm and sprinkler systems, DDC controls, control systems, prefabricated metal building and similar situations. These designs are normally provided under submittals as a shop drawing with engineering backup and as appropriate, seals of registered engineers specializing in the particular system.

16.3.2 Incidental design includes all documents, sketches, schematic diagrams, floor plan layouts, equipment schedules and other documents produced by the JOC Contractor to define the work required for projects that the City does not develop formal or abbreviated designs requiring a seal by a registered engineer. Incidental design does not include preparation of designs requiring an architect or engineer seal.

16.3.3 JOC Contractor represents, covenants, and agrees, and contractually assumes the obligation to furnish, all of the required Design Services through properly licensed and

experienced Design Professionals in complete accordance with all of the duties imposed on a Design Professional under the Agreement Documents, Laws, Regulations, or Legal Requirements, and the common law.

- 16.3.4 All Design Documents (and all other Project-related documents, models, computer drawings and other electronic expression, photographs and other expressions CADD, and BIM files and images included) that JOC Contractor and/or JOC Contractor's Design Professional(s) prepare in connection with a Job Order and the copyrights therein (collectively, the "Instruments of Service") will be the property of City. JOC Contractor covenants and agrees to execute any additional document reasonably requested by City to confirm such assignment without any additional compensation.

16.4 **CONSTRUCTION SERVICES**

- 16.4.1 The following subsections of this Section 16.4 set forth requirements beyond those set forth in Section 4 above which apply to Construction Services performed under a Job Order.

- 16.4.2 JOC Contractor must perform the Work using only those firms, team members and individuals designated by JOC Contractor consistent with each Job Order or otherwise approved by City pursuant to the General Conditions. No other entities or individuals may be used without the prior written approval of the Project Manager.

16.4.3 Construction Phasing

- 16.4.3.1 City use of the facilities is anticipated while the Work is being performed. The Work must be planned and accomplished so that there will be a minimum of interference and inconvenience to occupants in the building and agencies in the vicinity and to other craftsmen who may have to do work in the affected facilities. Any blockage of building exits or driveways must be coordinated in advance.

- 16.4.3.2 If applicable, furniture, portable office equipment and wall appurtenances not rigidly fastened to the walls must be moved by JOC Contractor, protected from damage and replaced to the original position upon completion of the work. If the work required by the Job Order will not allow furniture and portable office equipment to be replaced to its original position, new locations will be designated by City. Incidental costs associated with moving one-piece furnishings up to approximately 150 pounds to perform such tasks as painting, carpet or tile replacement, etc., are considered a general cost of building renovation and must be included in the JOC Contractor's Coefficient. Costs for large scale or wholesale removal and replacement of large quantities of desks or modular workstations, copiers, multiple full file cabinets, etc. to another location or storage outside the work space, or disassembly and reassembly of modular furniture is not considered part of the JOC Contractor's Coefficient and will be priced separately.

- 16.4.3.3 The work must, so far as practicable, be done in definite sections or divisions and confined to limited areas which must be completed before work in other sections or divisions are begun.

- 16.4.4 Work Site Conflicts. In the event of a conflict between JOC Contractor and others in an occupied facility or where other Contractors are performing work on the same facility under other Agreements, City will decide to dispute and that decision will be final.

- 16.4.5 Ownership of Work Product. Work Product prepared or otherwise created in connection

with the performance of this Agreement, including the Work, are to be and remain the property of City. For purposes of this provision, "Work Product" will include all designs, drawings, plans, specifications, ideas, renderings and other information or matter, in whatever form created (e.g., electronic or printed) and in all media now known or hereinafter created. All Work Product will be considered Work Made for Hire as defined in the United States Copyright Act 17 U.S.C. §101 (Copyright Act). If for any reason any such Work is found not to be a work for hire, JOC Contractor hereby transfers and assigns ownership of the copyright in such Work to City. The rights in this Section are exclusive to City in perpetuity.

16.5 **OPTIONAL LIQUIDATED DAMAGES**

16.5.1 Specific Job Orders. City will have the right to assess liquidated damages in relation to any specific JOC Project Agreement as set forth below.

16.5.2 Substantial Completion Liquidated Damages. JOC Contractor acknowledges and agrees that if JOC Contractor fails to obtain Substantial Completion of the Work within the Agreement Time, City will sustain extensive damages and serious loss as a result of such failure. The exact amount of such damages will be extremely difficult to ascertain. Therefore, City and JOC Contractor agree that if JOC Contractor fails to achieve Substantial Completion of the Work within the Agreement Time, City will be entitled to retain or recover from JOC Contractor, as liquidated damages and not as a penalty, the sum per calendar day as indicated in MAG § 108.9.

16.5.3 Final Acceptance Liquidated Damages. For the same reasons set forth in Section 16.5.2 above, City and JOC Contractor further agree that if JOC Contractor fails to achieve Final Acceptance of the Work within the Agreement Time, City will be entitled to retain or recover from JOC Contractor, as liquidated damages and not as a penalty, the sum per calendar day as indicated in MAG § 108.9 commencing from the actual date of Substantial Completion or Final Acceptance as required under any specific JOC Project Agreement.

16.5.4 MAG Liquidated Damages. Liquidated damages provisions in MAG § 108.9 may apply to any specific JOC Project Agreement.

16.5.5 City may deduct liquidated damages assessed pursuant to this Section 16.5 from any unpaid amounts then or thereafter due JOC Contractor under the Agreement or any specific JOC Project Agreement between JOC Contractor and City. Any liquidated damages not so deducted from any unpaid amounts due JOC Contractor must be payable to City at the demand of City, together with interest from the date of the demand at the highest lawful rate of interest payable to JOC Contractor.

16.6 **PERFORMANCE MEASUREMENT**

16.6.1 Performance Assessment. After the Final Acceptance of Work under each Job Order, City will complete a written evaluation of the performance of JOC Contractor on the Job Order.

16.6.2 Consideration in Assignment of Work. JOC Contractor's record of cost, schedule and quality performance and comparative assessments will be significant considerations in City's determination whether to award future Job Orders. JOC Contractor agrees that any determination by City not to award future Job Orders or Option periods based on performance will be at the sole discretion of City.

**SECTION 17 - PROVISIONS APPLICABLE SOLELY TO PRE-CONSTRUCTION SERVICES FOR
CONSTRUCTION MANAGER AT RISK****17.1 ADDITIONAL DEFINITIONS**

The definitions set forth in Section 2 and 15.1 above will apply to all Pre-Construction Services Agreements.

17.2 GENERAL

17.2.1 CM@Risk must perform the Services required by, and in accordance with the Agreement Documents and as outlined in Exhibit A of the Agreement to the satisfaction of the Project Manager, exercising the degree of care, skill, diligence and judgment a professional construction manager experienced in the performance of such services for construction and/or facilities of similar scope, function, size, quality, complexity and detail to the Project in urban areas throughout the United States, would exercise at such time, under similar conditions. CM@Risk must, at all times, perform the required services consistent with sound and generally accepted engineering principles and construction management and construction contracting practices.

17.2.2 As a participating member of the Project Team, CM@Risk must provide to City and Design Professional a written evaluation of City's Project Program and budget, each in terms of the other, with recommendations as to the appropriateness of each. CM@Risk must prepare a Baseline Cost Model that validates City's budget. The Baseline Cost Model must include all assumptions and basis of estimates in enough detail so that the Project Team can compare future detail estimates to the Baseline Cost model for variances. City and Design Professional will provide all the reasonably required data that is available in order to reach agreement between the team members that the Baseline Cost Model is an accurate projection of the costs of the Project.

17.2.3 CM@Risk must attend Project Team meetings, which may include, but are not limited to, bi-weekly Project management meetings, Project workshops, special Project meetings, construction document rolling reviews, public meetings and partnering sessions. CM@Risk attendance at design or other meetings in which CM@Risk is provided the opportunity but does not actively participate and/or is not properly prepared is not acceptable. Repeated instances of non-participation and/or lack of preparedness will be grounds for termination of CM@Risk Agreement for default.

17.2.4 CM@Risk must provide Pre-Construction Services, described herein, in a timely manner and consistent with the intent of the most current Drawings and Specifications. CM@Risk must promptly notify City in writing whenever CM@Risk determines any Drawings or Specifications are inappropriate for the Project and/or cause changes in the scope of Work that deviates more than the allowed contingencies within the Baseline Cost Model or requires an adjustment in the Baseline Cost Model, Detailed Cost Estimate, Detailed Project Schedule, GMP Proposals and/or in the Agreement Time for the Work, to the extent such as established.

17.2.5 CM@Risk when requested by City, must attend, make presentations and participate as may be appropriate in public agency and or community meetings, relevant to the Project. CM@Risk must provide drawings, schedule diagrams, budget charges and other materials describing the Project when their use is required or appropriate in any such public agency meetings.

- 17.2.6 **Ownership of Work Product.** All Work Product prepared or otherwise created in connection with the performance of this Agreement, including the Work, are to be and remain the property of City. For purposes of this provision, "Work Product" will include all designs, drawings, plans, specifications, ideas, renderings and other information or material, in whatever form created (e.g., electronic or printed) and in all media now know or hereinafter created. All Work Product will be considered Work Made for Hire as defined in the United States Copyright Act 17 U.S.C.

§101 (Copyright Act). If for any reason any such Work is found not to be a work for hire, Contractor hereby transfers and assigns ownership of the copyright in such Work to City. The rights in this Section are exclusive to City in perpetuity.

- 17.2.7 CM@Risk represents to City in completing Pre-Construction Services and providing the reports and analysis required thereunder, that Work can be properly and timely constructed within the GMP Proposal, if accepted. CM@Risk does not assume any design responsibilities unless specifically called for in the scope of work, but CM@Risk will be responsible for their errors, omissions or inconsistencies included in the Work.

17.3 **DETAILED PROJECT SCHEDULE**

- 17.3.1 The fundamental purpose of the Detailed Project 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 Detailed Project Schedule requirements. CM@Risk must, however, develop and maintain the Detailed Project Schedule on behalf of and to be used by the Project Team based on input from the other Project Team members. The Baseline Project Schedule must be developed as part of the Baseline Cost Model. The Detailed Project Schedule must use the Critical Path method ("CPM") technique, unless required otherwise, in writing by City. CM@Risk must use scheduling software acceptable to City to develop the Detailed Project Schedule. The Detailed Project Schedule must be presented in graphical and tabular reports as agreed upon by the Project Team. If Project phasing as described below is required, the Detailed Project Schedule must indicate milestone dates for the phases once determined. As part of construction phase, City may require CM@Risk to prepare a "resource loaded" schedule for all work, including work performed by Subcontractors, detailing each of the project tasks and the required/anticipated number of personnel per day for each task. CM@Risk must also indicate on the schedule its ability to meet said required/anticipated personnel requirements.

- 17.3.2 CM@Risk must include and integrate in the Detailed Project Schedule the services and activities required of City, Design Professional and CM@Risk including all construction phase activities based on the input received from City and the Design Professional. The Detailed Project Schedule must define activities as determined by City to the extent required to show: (a) the coordination between preliminary design and various pre-construction documents, (b) any separate long-lead procurements, (c) any permitting issues, (d) any land, right-of-way, or easement acquisition, (e) bid packaging strategy and awards to Subcontractors and Suppliers, (f) major stages of construction, (g) start-up and commissioning, and (h) occupancy of the completed Work by City. The Detailed Project Schedule must include by example and not limitation, proposed activity sequences and durations for design, procurement, construction and testing activities, milestone dates for actions and decisions by the Project Team, preparation and processing of shop drawings

and samples, delivery of materials or equipment requiring long-lead time procurement (if any), milestone dates for various construction phases, Total Float for all activities to the extent authorized by City, relationships between the activities, City's occupancy requirements showing portions of the Project having occupancy priority, and proposed dates for Final Acceptance.

- 17.3.3 A Baseline Project Schedule must be initiated with the project Baseline Cost Model and agreed to by the project team at the same time. CM@Risk must update and maintain a detailed Project Schedule throughout pre-construction such that it will not require major changes at the start of the construction phase to incorporate CM@Risk's plan for the performance of the construction phase Work. CM@Risk must provide updates and/or revisions to the Detailed Project Schedule for use by the Project Team, whenever required, but no less often than at the Project Team meetings. CM@Risk must include with such submittals a narrative describing its analysis of the progress achieved to-date vs. the Baseline Project Schedule, including any concerns regarding delays or potential delays, and any recommendations regarding mitigating actions.
- 17.3.4 If phased construction is deemed appropriate at the time of developing the Baseline Cost Model or during the development of the Detailed Project Schedule, and City approves, CM@Risk must 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. CM@Risk must 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.
- 17.3.5 Long Lead Time Items. As part of developing the Detailed Project Schedule, CM@Risk must identify all long lead time materials, fabrications, equipment, or other items which may impact the Project Schedule and may require early action on the part of the Project Team. Dates for selecting and ordering long lead time items will be included and highlighted in the Detailed Project Schedule
- 17.3.6 Equipment Plan. Contractor must develop an Equipment Plan that addresses all rental and owned equipment, regardless of whether such equipment will be provided by CM@Risk or subcontractor(s), that will be necessary to construct the Project and the cost of which will be included as a Cost of the Work in the GMP Proposal. The Equipment Plan will seek to minimize the cost of the equipment to City and maximize the efficient and coordinated use of the equipment for completion of the Project. The Equipment Plan will not only include the costs and allowable lease rates for the equipment, but will also include an equipment schedule that will be incorporated into the Detailed Project Schedule and the Schedule of Values submitted with the GMP Proposal.
- 17.4 **DESIGN DOCUMENT REVIEWS**
- 17.4.1 CM@Risk must evaluate periodically the availability of labor, materials/equipment, cost-sensitive aspects of the design; and other factors that may create an unacceptable variance to the Baseline Cost Model and/or Baseline Project Schedule.
- 17.4.2 CM@Risk must 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 CM@Risk to construct the Project. These additional

- investigations, if agreed to be necessary by the Project Manager and the Design Professional, will be acquired by City and copies of the reports will be provided to CM@Risk.
- 17.4.3 CM@Risk must meet with the Project Team as required to review designs during their development. CM@Risk must familiarize itself with the evolving documents through pre-construction. CM@Risk must 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. CM@Risk must furthermore 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. CM@Risk must use established value analysis principles in recommending cost effective alternatives.
- 17.4.4 CM@Risk must routinely conduct constructability and bid-ability reviews of the Drawings and Specifications as necessary to satisfy the needs of the Project Team. The reviews must attempt to identify all discrepancies and inconsistencies in the Construction Documents especially those related to clarity, consistency, completeness and coordination of Work of Subcontractors and Suppliers.
- 17.4.4.1 CM@Risk must 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 is prepared to facilitate fabrication, transport and installation; (e) sequences of Work required by or inferable from the Drawings and Specifications are practicable; (f) 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; and (g) the design maintains continued operation of the existing City systems and maintains traffic on adjacent roadways. CM@Risk must also review the Drawings and Specifications to ensure that what is depicted therein can be constructed as designed and must promptly inform the Project Team of any issues.
- 17.4.4.2 CM@Risk must check cross-reference 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.
- 17.4.4.3 The results of the reviews must be provided to Project Team in formal, written reports clearly identifying all reviewed documents and the discovered discrepancies and inconsistencies in the Drawings and Specifications with notations and recommendations made on the Drawings, Specifications and other documents. CM@Risk must meet with Project Team to discuss any findings and review reports.
- 17.4.4.4 CM@Risk's reviews must be from a Contractor's perspective, and though it will serve to eliminate/reduce the number of RFIs and changes during the construction phase, responsibility for the Drawings and Specifications will remain with the Design Professional and not CM@Risk.

- 17.4.5 It is CM@Risk's responsibility to assist the Design Professional in ascertaining that, in CM@Risk's professional opinion, the Construction Documents are in accordance with applicable Laws, Regulations, or Legal Requirements, building codes, sound engineering principle's rules and regulations. If CM@Risk recognizes that portions of the Construction Documents are at variance with applicable laws, statutes, ordinances, building codes, sound engineering principle's rules and regulations, it must promptly notify the Project Team in writing, describing the apparent variance of deficiency. However, the Design Professional is ultimately responsible for the compliance of the Drawings and Specifications with those laws, statutes, ordinances, building codes, rules and regulations.
- 17.4.6 The Project Team will routinely identify and evaluate using value analysis principles and alternate systems, approaches, design changes that have the potential to reduce Project costs while still delivering a high quality and fully functional Project consistent with the Project Program. If the Project Team agrees, CM@Risk in cooperation with the Design Professional, will perform a cost/benefit analysis of the alternatives and submit such in writing to the Project Team. City, through the Project Manager, will direct which alternatives will be incorporated into the Project. The Design Professional will have full design responsibility for the review and incorporation of CM@Risk suggested alternatives into the Drawings and Specifications. CM@Risk must analyze the costs and schedule impacts of the alternatives against the Baseline Cost Model and Schedule and provide a recommendation for the Project Team's consideration and City's approval prior to the establishment of the GMP.
- 17.5 **BASELINE COSTS MODEL, DETAILED COST ESTIMATES, AND SCHEDULE OF VALUES**
- 17.5.1 At the conclusion of the Master Planning and Programming, if required, CM@Risk will review all available information regarding the design and scope of the Project using CM@Risk's experience in performing similar work, knowledge of similar projects and current and projected construction costs and, based upon that review, must develop a Baseline Cost Model for review by the Project Team and approval by City. Once approved by City, the Baseline Cost Model will be continually referenced as detailed estimates are created as the design progresses throughout Pre-Construction until the final GMP for the entire Project is established. A final GMP for the entire Project must be established and approved by City prior to the start of construction. It is the responsibility of CM@Risk to ensure City has sufficient information to evaluate and approve a final GMP prior to the time necessary to start construction so construction can be completed within the Agreement Time. The Project Detailed Cost Estimate will be the best representation from CM@Risk of what the complete functional Project's construction costs will be as indicated by the most current available documents and will be constantly checked against the Baseline Cost Model. CM@Risk must communicate to the Project Team and assumptions made in preparing the Baseline Cost Model. The Baseline Cost Model must support CM@Risk's Detailed Cost Estimates and may be broken down initially as dictated by the available information, as required by City.
- 17.5.2 After receipt of the Design Professional's most current documents from certain specified pre- construction milestones, CM@Risk must provide a draft Detailed Cost Estimate including a detailed written report detailing any variances to the Baseline Cost Model and Baseline Project Schedule. The Design Professional and CM@Risk will reconcile any disagreements on the estimate to arrive at an agreed upon Detailed Cost Estimate for the construction costs based on the scope of the Project through that specified pre-construction milestone. Pre-Construction milestones applicable to this paragraph are:

Master Planning and Programming, Schematic Design, 50% Design Development, 100% Design Development, and 50% Construction Drawings, If no consensus is reached, City will make the final determination. If the Project Team requires additional updates of the Detailed Cost Estimate beyond that specified in this paragraph, CM@Risk must provide the requested information in a timely manner.

- 17.5.3 If at any point the Detailed Cost Estimate submitted to City exceeds the previously accepted Baseline Cost Model or previously approved Detailed Cost Estimate agreed to as set forth in Section 17.5.2 above, CM@Risk must make appropriate recommendations to project Team on means/methods, materials, and or other design elements that it believes will reduce the estimated construction costs, such that it is equal to or less than the established Project Team's Baseline Cost Model.
- 17.5.4 Unless other levels of completion are agreed to in writing in the Construction Documents, at 50% Construction Drawings and included with the associated report, CM@Risk must also submit to the Project Team for review and approval a Schedule of Values that complies with the following requirements. The Schedule of Values must be based on City standard bid schedule and highlight significant variances from any previously submitted Schedule of Values. The Schedule of Values must be directly related to the breakdowns reflected in the Detailed Project Schedule and CM@Risk's Detailed Cost Estimate. In addition, the Schedule of Values must: (a) detail unit prices and quantity take-offs, (b) detail all other contingencies and unit price Work shown and specified in the detailed design documents.
- 17.5.5 CM@Risk is to track, estimate/price and address the Project Team's overall project cost issues that arise outside of the Baseline Cost Model and the latest approved Detailed Cost Estimate such as: City generated changes, Project Team proposed changes, alternate system analysis, constructability items and value engineering analysis. The system used to implement this process will be referred to as the Design Evolution Log. This is to be addressed between the Baseline Cost Model and the Master Planning and Programming Detailed Cost Estimate, and then (unless other levels of completion are agreed to in writing in the Construction Documents) between the Detailed Cost Estimates for each of the pre-construction milestones thereafter, Schematic Design, 50% Design Development, 100% Design Development, and 50% Construction Documents, and the bid packages for all Phases.
- 17.5.6 Upon request by City, CM@Risk must submit to City a cash flow projection for the Project based on the current updated/revised Detailed Project Schedule and the anticipated level of payments for CM@Risk during the design and construction phases. In addition, if requested by City and based on information provided by City, CM@Risk must prepare a cash flow projection for the entire Project based on historical records for similar types of projects to assist City in the financing process.
- 17.5.7 Construction Water. CM@Risk must estimate the quantity of water to be used and include the cost thereof in each Detailed Cost Estimate and GMP Proposal provided by City.

17.6 **SUBCONTRACTOR AND MAJOR SUPPLIER SELECTIONS**

- 17.6.1 There are two ways to select Subcontractors and major Suppliers prior to submission of a GMP Proposal: (1) qualifications-based selection; or (2) a combination of qualifications and price. Except as noted below, the selection of Subcontractors/Suppliers is the sole responsibility of CM@Risk. In any case, CM@Risk is solely responsible for the performance of the selected Subcontractors/Suppliers, and for compliance with the requirements of

- Title 34 of the Arizona Revised Statutes in the selection of a Subcontractors/Suppliers, to the extent applicable. CM@Risk must comply with its Subcontractor Selection Plan submitted with its Statement of Qualifications.
- 17.6.2 City may approve the selection of a Subcontractor(s) or Suppliers(s) based only on their qualifications when CM@Risk can demonstrate it is in the best interest of the Project. All Work that is performed, after such a qualifications-based selection, for a price that is negotiated by CM@Risk will be billed in accordance with the GMP for actual costs and may be subject to audit by City.
- 17.6.2.1 Qualifications based selection of a Subcontractor(s)/Supplier(s) should only occur prior to the submittal of the GMP Proposal.
- 17.6.2.2 If a Subcontractor/Supplier selection plan was submitted and agreed to by City, CM@Risk must apply the plan in the evaluation of the qualifications of a Subcontractor(s) or Supplier(s) and provide City with its review and recommendations.
- 17.6.2.3 CM@Risk must receive written City approval for each selected Subcontractor(s) and Supplier(s).
- 17.6.2.4 CM@Risk must negotiate costs for services/supplies from each Subcontractor/Supplier selected under this method.
- 17.6.3 All Work must be competitively bid unless a Subcontractor or Supplier was selected pursuant to Section 17.6.2 above.
- 17.6.3.1 CM@Risk must develop Subcontractor and Supplier interest, submit the names of a minimum of three qualified Subcontractors or Suppliers for each trade in the Project for approval by City and solicit bids for the various Work categories. If there are not three qualified Subcontractors/Suppliers available for a specific trade or there are extenuating circumstances warranting such, CM@Risk may request approval by City to submit less than three names. Without prior written notice to City, no change in the recommended Subcontractors/Supplies will be allowed.
- 17.6.3.2 If City objects to any nominated Subcontractor/Supplier or to any self-performed Work for good reason, CM@Risk must nominate a substitute Subcontractor/Supplier that is acceptable to City.
- 17.6.3.3 CM@Risk must distribute Drawings and Specifications, and when appropriate, conduct a Pre- Bid Conference with prospective Subcontractors and Suppliers.
- 17.6.3.4 If CM@Risk desires to self-perform certain portions of the Work, it must request to be one of the approved Subcontractor bidders for those specific bid packages. CM@Risk's bid will be evaluated in accordance with the process identified below. If events warrant and City concurs that it is necessary in order to ensure compliance with the Project Schedule and/or the most recent Detailed Cost Estimate, CM@Risk may be authorized to self-perform Work without bidding or rebidding the Work. When CM@Risk self-performs work without bidding, only the actual costs associated with performing the Work in accordance with the approved GMP will be billed and may be subject to audit by City.
- 17.6.3.5 CM@Risk must receive, open, record and evaluate the bids; provided, however, that if CM@Risk or one of its affiliates is bidding to self-perform the Work that is the subject of the bid, then the bids must be received, opened, recorded and evaluated by Project Manager

instead of CM@Risk. Bids for each category of Work must be opened and recorded at a pre-determined time. The apparent low bidders must be interviewed to determine the responsiveness of their proposals. In evaluating the responsiveness of bid proposals CM@Risk, in addition to bid price, may 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 Subcontractor/Supplier bids must be done with Project Manager in attendance to observe and witness the process. CM@Risk must resolve any Subcontractor/Supplier bid withdrawal, protest or disqualification in connection with the award at no increase in the Cost of Work.

17.6.4 CM@Risk will be required to prepare two different reports on the subcontracting process.

17.6.4.1 Within fifteen days after each major Subcontractor/Supplier bid opening process; CM@Risk must prepare a report for City's review and approval identifying the recommended Subcontractors/Supplier for each category of Work. The report must detail: (a) the name of the recommended Subcontractor/Supplier and the amount of the Subcontractor/Supplier bid for each sub-agreement; (b) the sum of all recommended Subcontractor/Supplier bids received; (c) and trade work and its cost that CM@Risk intends to self-perform, if any.

17.6.4.2 Upon completion of the Subcontractor/Supplier bidding process, CM@Risk must submit a summary report to City of the entire Subcontractor/Supplier selection process. The report must indicate, by bid process, all Subcontractors/Suppliers contacted to determine interest, the Subcontractors/Suppliers solicited, the bids received and costs negotiated, and the recommended Subcontractors/Suppliers for each category of Work.

17.6.5 The approved Subcontractors/Suppliers will provide a Schedule of Values with their bid proposals, which will be used to create the overall Project Schedule of Values.

17.6.6 If after receipt of sub-bids or after award to Subcontractors and Suppliers, City objects to any nominated Subcontractor/Supplier or to any self-performed Work without any reasonable basis, CM@Risk must nominate a substitute Subcontractor or Supplier, preferably if such option is still available, from those who submitted Subcontractor bids for the Work affected. Once such substitute Subcontractors and Suppliers are consented to by City, CM@Risk's proposed GMP for the Work or portion thereof must be correspondingly adjusted to reflect any higher or lower costs from any such substitution.

17.7 **GMP PROPOSAL**

17.7.1 When a GMP Proposal is submitted for a phase of the Work, the GMP will have a Detailed Cost Estimate of the Costs of the Work (as set forth in Section 15.2) in each phase of the Work that is being proposed plus the current estimate for all other Work. City will not approve the GMP for the phase of work without a total estimate for the complete Project. City may request a GMP Proposal for all or any portion of the Project and at any time during pre-construction. Any GMP Proposals submitted by CM@Risk must be based on and consistent with Baseline Cost Model and the current update/revised Detailed Cost Estimate at the time of the request and include any clarifications or assumptions upon which the GMP Proposal(s) are based.

17.7.2 A GMP Proposal for the entire Project will be the sum of the Cost of the Work, CM@Risk Fee, and General Conditions Cost. CM@Risk guarantees to complete the Project at or less than

the final GMP Proposal amount plus approved Change Orders. CM@Risk will be responsible for any costs for expenses that would cause the Cost of the Work actually incurred, including the Construction Fee and General Conditions Costs, to exceed the GMP.

17.7.3 CM@Risk must prepare its GMP Proposal in accordance with City's request for GMP Proposal requirements based on the most current completed Drawings and Specifications at that time, which unless otherwise directed by City in writing, will be at 100% Construction Drawings. CM@Risk must mark the face of each document of each set upon which its GMP Proposal is based. These documents must be identified as the GMP Plans and Specifications. CM@Risk must send one set of those documents to the Project Manager, keep one set and return the third set to the Design Professional.

17.7.4 An updated/revised Detailed Project Schedule, Equipment Plan, and Schedule of Values must be included in any GMP Proposal(s), all of which must reflect the GMP Plans and Specifications the Detailed Project Schedule must be shown in relationship to the Project Schedule and identify any variance to the Baseline Project Schedule. Any such Detailed Project Schedule updates/revisions must continue to comply with the requirements of Section 17.3.1 through 17.3.5.

17.7.5 **GMP Proposals(s) Review and Approval**

17.7.5.1 CM@Risk must meet with the Project Team to review the GMP Proposal(s) and the written statement of its basis. In the event the Project Team discovers inconsistencies or inaccuracies in the information presented, CM@Risk must make adjustments as necessary to the GMP Proposal.

17.7.5.2 If during the review and negotiation of GMP Proposals design changes are required, City may authorize and cause the Design Professional to revise the GMP Plans and Specifications to the extent necessary to reflect the agreed-upon assumptions and clarifications contained in the final approved GMP Proposal. Such revised GMP Plans and Specification will be furnished to CM@Risk. CM@Risk must promptly notify the Project Team in writing if any such revised GMP Plans and Specifications are inconsistent with the agreed upon assumptions and clarifications.

17.7.6 All portions of or items comprising the GMP Proposal are subject to audit by City, as deemed appropriate by City, including, without limitation, any based upon unit prices or Work to be self-performed by CM@Risk, or its affiliates.

17.8 **PAYMENT PROCEDURE FOR PRE-CONSTRUCTION SERVICES**

17.8.1 Requests for monthly payments by CM@Risk for Pre-Construction Services must be submitted monthly and must be accompanied by a progress report, detailed invoices and receipts, if applicable. Any requests for payment must 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 will be made in accordance with the percentage of work completed during the preceding month.

17.8.2 In no event will City pay more than seventy-five (75%) of the Agreement Price until acceptance of ALL Pre-Construction Services and award of the final approved Construction Services Agreement for the entire Project by City Council. If CM@Risk does not prepare a

GMP Proposal that is acceptable to City, or the GMP Proposal exceeds the City's Construction Budget, then CM@Risk understands and acknowledges that it will forfeit any right to receive the 25% of the Agreement Price being retained by City.

17.8.3 CM@Risk agrees that no charges or claims for costs or damages of any type will be made by it for any delays or hindrances beyond the reasonable control of City during the progress of any portion of Pre-Construction Services specified in this Agreement. Such delays or hindrances, if any, will be solely compensated for by an extension of time for such reasonable period and may be mutually agreed between the parties. It is understood and agreed, however, that permitting CM@Risk to proceed to complete any such Services, in whole or in part after the date to which the time of completion may have been extended, will in no way act as a waiver on the part of City of any of their respective legal rights herein.

17.8.4 No compensation to CM@Risk will be allowed contrary to Article I, Chapter I, Title 34 of the Arizona Revised Statutes.

17.8.5 If any service(s) executed by CM@Risk is abandoned or suspended in whole or in part, for a period of more than 180 days through no fault of CM@Risk, CM@Risk is to be paid for the services performed prior to the abandonment or suspension.

17.9 **SURVIVAL OF THE DESIGN SERVICES AGREEMENT, DUTIES, OBLIGATIONS AND WARRANTIES**

If the GMP Proposal is accepted by City and a Construction Agreement is entered into between City and CM@Risk, the duties, obligations and warranties of CM@Risk under the Pre- Construction Services Agreement survive and are incorporated into the resulting Construction Agreement.

General Conditions Appendices

SECTION 15 – APPENDICES

The following Appendices attached hereto are referenced in the General Conditions and are incorporated herein.

- Appendix 1 – Policy Statement for Calculating Delays and Damages
- Appendix 2 – Cost Reduction Incentive Proposals for Design Bid Build Agreements
- Appendix 3 – Contractor's Affidavit Regarding Settlement of Claims
- Appendix 4 – Forms of Performance Bond
- Appendix 5 – Forms of Payment Bond
- Appendix 6 – Dispute Resolution
- Appendix 7 – Certificate of Completion
- Appendix 8 – Construction Sign Detail
- Appendix 9 – Cost of the Work (Applicable solely to Construction Manager at Risk and Job Order Contracting)
- Appendix 10 – Landscape Establishment Period

General Conditions Appendix 1

CALCULATING DELAYS AND DAMAGES

The purpose of this policy statement is to establish guidelines and procedures for negotiation between the Contractor and City of Chandler relating to compensation for delays pursuant to Arizona Revised Statutes (A.R.S.) 34-221(F). This policy statement contains notice requirements in addition to those set forth in the Agreement Documents, and will be the Agreement Provision contemplated by that statute.

NOTE: As used herein, the term "Engineer" will refer to the City of Chandler City Engineer or his/her designated representative. Nothing in this Policy Statement will be construed to void any provision in the Agreement which requires timely notice of delays or provides for arbitration or any other procedure for settlement or provides for liquidated damages.

I. TYPES OF DELAYS:

For the purposes of this document, there are essentially four types of delays encountered by City of Chandler Construction Contractors; excusable/compensable, excusable/non-compensable, non-excusable, and concurrent. Only delays that extend Agreement Completion Time set forth in the Agreement Document will be considered for issues relating to Agreement extensions or additional compensation. All other delays are considered to be activity delays and do not entitle the Contractor to either time extensions or additional compensation. Agreement Completion Time will be defined as the date set forth in Maricopa Association of Governments (MAG) Uniform Standard Specification Section 101 and as may be modified by the Agreement Documents.

A. Excusable/Compensable:

These are delays caused solely by the City's actions or inactions, are unreasonable under the circumstances, and which were not within the contemplation of the parties to the Agreement at or prior to the time of execution of the Agreement. Since the Contractor presumably has no control over the events causing the delay, he may be entitled to both Agreement time extensions and additional compensation for delay damages. Further, he/she may be entitled to additional compensation from the impact of that delay on other work. Examples of excusable/compensable (E/C) delays include: failure to properly locate an underground City-owned utility within 2 feet of the actual location; failure to relocate City-owned utilities far enough in advance of construction in an area where the Contractor is scheduled to work that it delays start or completion of the Contractor's regularly scheduled work; failure to provide City-furnished equipment or materials in a timely manner if required by the Agreement; failure to acquire necessary Right-of-Way or Public Utility Easements prior to the Contractor beginning Work in the area; failure to timely return Shop Drawings or other Agreement Submittals in accordance with the Agreement; unreasonable delay by the City in making decisions which affect critical activities; surveying errors when the City is contractually responsible for providing Project Surveying. This list is not meant to be all inclusive, but is intended merely as examples of the type of City action or inaction which can result in a Contractor's claim for additional time and compensation.

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B. Excusable/Non-compensable:

These are delays over which neither the City nor the Contractor had control. Since both parties to the Agreement have been potentially damaged by the delay, but neither have caused it, only Time Extensions are warranted. Examples of excusable, non-compensable (E/N) delays include: unusually severe weather; fire; acts of God; failure of non-City owned utilities (SRP, CenturyLink, Cable TV, Southern Pacific Railroad, and Southwest Gas, etc.) to properly or timely locate accurately; failure of non-City owned utilities to relocate in advance of construction; the voluntary or involuntary filing for Bankruptcy protection by a Supplier or Subcontractor which causes the Supplier/Subcontractor to fail to meet a contractual deadline provided the Contractor can provide documentation that he/she executed the required Purchase Orders/Subcontract Agreements and received delivery schedules which, if met, would have eliminated the delay; delays as a result of an incomplete shutdown of a City or non-City owned utility main (the City does not guarantee a complete shutdown). This list also is not necessarily all inclusive but merely indicative of type and class of E/N delays.

C. Non-excusable/Non-compensable:

These are delays caused by the actions or inactions of Contractor or an officer, employee, agent, Subcontractor, Supplier or any other party for whom the Contractor is responsible. Since the Contractor has assumed responsibility for the risks associated with the events that caused the delay, he/she are not entitled to either time extensions or monetary delay damages. All non-excusable delays are also non-compensable. Examples of non-excusable, non-compensable (N/N) delays include: failure to perform by the Contractor, its Subcontractors and/or Suppliers (except as noted in section I.B above); failure to provide adequate labor, materials, and/or equipment on the Project; failure to perform contractually-required coordination with utilities, agencies and other Contractors; failure to notify the Engineer, in writing, of delay impacts within two working days, as required by MAG 104.2.3, or the next work day, as required by MAG 109.8.2; failure to timely submit Shop Drawings; failure to pothole or otherwise visually locate utilities sufficiently ahead of the Work to allow the Engineer to direct corrective action when necessary; delays due to retesting of previously failed work, re-inspection, and/or restaking resulting from faulty workmanship, poor quality control, or lack of compliance with Agreement Specifications. Again, this list is not necessarily all inclusive.

D. Concurrent:

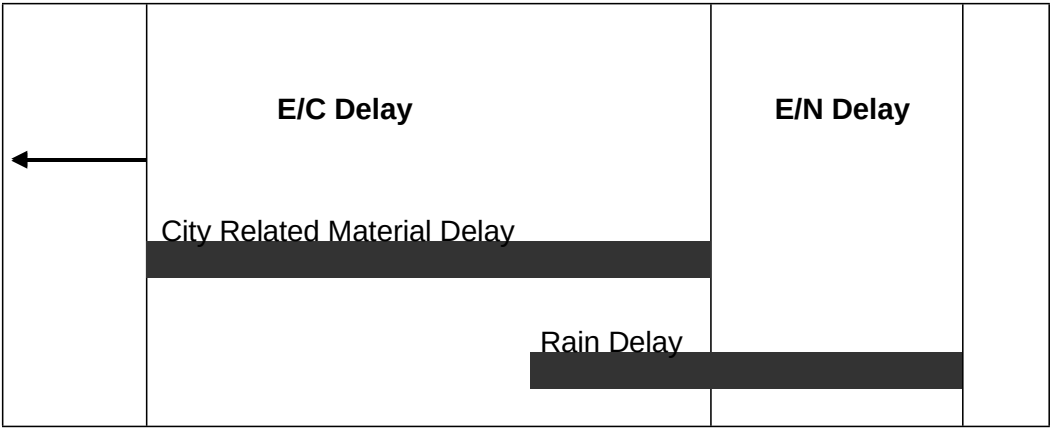
When two or more delays occur simultaneously or overlap, each delay is analyzed separately to determine its impact on the overall project completion date based on when that delay started. Once again, only those delays which actually extend the Agreement completion time are considered as delays. The concurrent delay is considered an additional delay only to the extent it prolongs the delay to the Agreement Completion Time beyond the date that the one it is concurrent with had already delayed that date. For example, if two delays are concurrent, and one is five days long and the second is seven days long, the second concurrent delay will only extend the Agreement Completion Time by two days. The same method of analysis is

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used when there are multiple concurrent delays. Only those extending the Project Completion Date are considered to be delays for the purposes of this policy. The portion of each concurrent delay that delays the completion of the work is classified in the same manner as described previously for individual delays and being either E/C, E/N or N/N.

An example of a concurrent delay is where the City delays furnishing material, but the Contractor could not have installed it anyway due to unusually severe weather. The effect of the first delaying activity will extend for the full duration and will be considered controlling on the Contractor’s schedule. A subsequent, concurrent delay will thereafter only be considered to effect the project completion (if at all) once the first delaying activity has ceased to impact the project completion. In this case, if the unusually severe weather continued and delayed the work after the material was delivered, the first portion of the delay would be classified E/C (delay for material) and the second as E/N (delay due to unusually severe weather). Using the procedure set forth above, the entire concurrent portion would be considered E/C as shown in the chart which follows.

Example of a Concurrent Delay:



II. ANALYZING THE DELAY:

The Contractor must provide all documents required or requested by the Engineer to analyze the delay(s). It is important to understand that, prior to the delay analysis, delays and their impacts are alleged issues. The information the Contractor provides will be compared with the Inspector’s Daily Log, Schedules and other available Project information and together they will support or refute that delays occurred and, if so, how they impact other work and the overall project completion. The Contractor’s delay in providing these documents will be considered prima facie evidence that either the delay did not occur or it did not impact the Project Completion Date and any claim for time extension or damages will be denied.

The Engineer will accept delay analyses in CPM format, as these may demonstrate to his/her satisfaction whether or not Project Completion has been impacted by a specific event. If the Contractor chooses not to use CPM scheduling procedures, then the burden will be on the Contractor to prove to the Engineer’s satisfaction that the Project Completion has been impacted. The procedures

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below assume that the Contractor is using CPM scheduling methods. As a minimum the Contractor must provide the following materials to the Engineer:

- A. As-Planned Schedule. The initial construction schedule, required by the Agreement Documents, will be considered the baseline schedule. It is to the Contractor's advantage that the As-Planned (baseline) Schedule be as detailed as possible in order for delays, as they occur, to be incorporated into the schedule in representative locations. It is also to the Contractor's advantage to use a computer software program to generate the schedule since updated schedules are required monthly by the Agreement Documents and since updated schedules are required to support delays and requests for additional compensation for delays. The As-Planned (baseline) Schedule must be presented in network format which clearly shows the interrelationships of the activities. The Contractor must also provide a printout of the activities showing early start, early finish, late start, late finish, duration and float. The activity list printout must also indicate predecessor and successor activities.
- B. As-Built Schedules. The as planned (baseline) schedule must be updated with complete progress-to-date information (actualized) up to the date of the start of the alleged delay. Each updated schedule will serve as the as-built schedule for analyzing the alleged delay and provide a new baseline as-planned schedule for the next delay. This process must be repeated for each alleged delay as it occurs. In updating the baseline schedule, the alleged delay must be treated as an activity and inserted into the schedule as a predecessor to the impacted activity (ies). When an activity that has already started is impacted, it is preferable to divide this activity into two parts and show the impact affecting the second part. For schedules which incorporate a time line (or data date), the delay activity must be inserted at the time it actually occurred. Some software scheduling programs have a PAUSE-RESUME feature that can be used to facilitate the requirements. The updated schedule must also be accompanied by a listing of activities as with the baseline schedule. This activities list must contain the alleged delay as an activity showing the duration and the activities which are predecessors and successors to it. When computer generated schedules are used, the Contractor must provide, in electronic media format, the complete data files for the updated schedule that included the delay activity, preferably either in Suretrak or in Microsoft Project. Each electronic media must contain a label identifying the Project name, Contractor's name, program name and version number, data date and project finish date.
- C. Other Documents: In order to determine the amount of the alleged delay and if it is compensable, the Contractor must provide all backup documentation relevant to the issue and as required by the Engineer. This documentation must include copies of such items as: purchase orders; delivery schedules; correspondence; memoranda of telephone calls; force account daily worksheets (initialed by the Inspector); payroll data; estimating (bid) worksheets; and any other materials which may be requested by the Engineer.
- D. Procedure: Only after receipt of sufficient documentation will the Engineer analyze each alleged delay and determine if it is supported or refuted. If supported, the Engineer will determine if it is excusable or non-excusable, compensable or non-

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compensable. If the Engineer determines that the delay did not affect the Project Completion, the as-planned schedule, which has been updated to the date of the alleged delay, must be revised to indicate this. If the Engineer determines the delay did occur but was N/N, then no time extension will be granted. It is imperative that an actualized schedule be submitted as soon as the occurrence of the alleged delay is known. In no event will the Contractor submit an actualized updated schedule later than 60 days after the occurrence of the alleged delay becomes known.

If the Engineer determines the delay did occur and was excusable but, due to a reason listed in section I.B. is non-compensable, he/she will determine the length of the E/N delay and prepare a Change Order to add that time to the Agreement. The Engineer's decision will be final.

If the Engineer determines the delay was excusable and compensable, he/she will determine the length of the E/C delay and proceed to review the Contractor's damage calculations in accordance with Section III. The Engineer will check the Contractor's calculations, review the backup documentation provided, and prepare a Change Order to cover both the additional compensation and the time extension. The Engineer's decision on both the time extension and additional compensation for the delay will be final.

If the issue involves a concurrent delay, the Engineer will analyze available data to determine the portions which are E/C, E/N, and/or N/N as described above. The Engineer will proceed to determine the length of E/C delay and verify the Contractor's delay damage calculations, if any are provided. Upon completion of this review, the Engineer will prepare a Change Order for the Contractor's review and signature. The Engineer's decision regarding excusable delay and additional compensation for the delay is final.

The amount of time the Engineer will require to analyze the alleged delay(s) will depend upon the Engineer's workload, the complexity of the delay analysis, availability of supporting data, extent of cooperation by the Contractor, and other factors beyond the Engineer's control. It is entirely possible other delay(s) may occur while the Engineer is analyzing particular claim for delay(s). The Engineer's failure to respond to the Contractor in a set period of time will not be used as the basis for a further delay claim or as justification for extending and existing delay claim. The time required for delay analysis by the Engineer will not be counted against the time allotted for processing Final Payment as required by (MAG Section 109.7(B)) or the release of retention and Final Payment as prescribed by A.R.S. Arizona Revised Statutes §34-221.

III. CALCULATING MONETARY DELAY DAMAGES:

Additional compensation for delay, when authorized by the Engineer, will be calculated in accordance with MAG Section 109.5 ACTUAL COST WORK with the following exceptions:

- A. No additional compensation or other monetary damages will be awarded or paid for any loss of anticipated profits by the Contractor, Subcontractors or Suppliers.

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- B. No additional compensation or other monetary damages will be awarded for home office overhead or non-project general conditions of the Contractor, Subcontractors or Suppliers.
- C. Equipment:
 - 1. Contractor-owned equipment rate calculations must be computed in accordance with Section 109.04(D)(3), Arizona Department of Transportation "Standard Specifications for Road and Bridge Construction," 2008 or latest edition and as modified herein. Year and regional adjustment factors must be based on the most recent publications of the Rental Rate Blue Book for Construction Equipment, published by the Equipment Guide-Book Company, San Jose, CA, same as provided by ADOT and in print as of the date of alleged delay. In no event will the compensation for Contractor-owned equipment exceed the purchase price, including tax, paid by the Contractor for the equipment. Compensation will not be allowed for small tools or equipment that show a daily equipment rental rate of less than \$5.00 per day or for unlisted equipment that has a value of less than for hundred dollars (\$400.00).
 - 2. For leased and rented equipment or equipment not otherwise listed in the Blue Book, rental contracts, or other supporting data will be used to establish the hourly rate. No hourly operating expense will be allowed for delay on standby equipment. In no case will equipment be considered for rental which exceeds the hourly rate for the first eight hours and the daily rate divided by eight for all additional hours as compared with similar equipment listed in the Blue Book. The hourly standby rate must be computed as the lesser of:
 - a. Dividing the monthly invoice or rental value by 176 hours per month when the equipment is utilized by the Contractor for more than three weeks;
 - b. Dividing the monthly invoice or rental value by 40 hours per week when the equipment is utilized by the Contractor for more than three days.

In no event will compensation be paid for delay at more than 8 hours per day or 40 hours per week.
 - 3. Except for vehicles used by supervisory personnel, all equipment will be paid at the "standby" rate during the delay period.
 - 4. Equipment brought solely to mitigate the delay (such as pumps, light plants, etc.) may be paid in accordance with ADOT section 109.04(D) (3).
 - 5. The Blue Book regional adjustment will apply in determining rental rates.
- D. Material:

Allowable material charges may include, in addition to material incorporated in the

General Conditions Appendix 1

work material used to mitigate the delay such as barricades, plates, shoring, cold mix, etc. Except in emergencies the Contractor will not employ such material without the prior written approval of the Engineer.

E. Labor:

1. Except for Supervisory Personnel (Superintendent, Project Engineer, and Foremen), labor wages will not be paid after the first one-half day of claimed delay or impact. It is expected the Contractor will reassign or layoff unneeded employees.
2. For Foreman wages to be included, that Foreman must have been actively employed on the project prior to the commencement of the delay and be directly responsible for the activity being delayed.
3. Labor burden must be actual amounts incurred but must not exceed the ADOT approved rate.

F. All costs (equipment, material, and labor) must be substantiated by the City of Chandler's Daily Work Reports.

IV. DOCUMENT REQUIRED FOR CLAIM ANALYSIS:

For purposes of reviewing the Contractor's request for additional compensation, it will be required that the Contractor submit the following listed information. Information requested must be prepared on forms which are substantially similar to the City of Chandler's Daily Work Report form, a copy of which is attached as an exhibit.

A. Labor:

For each employee, laborer, and foreman, for which compensation is requested: Name, classification, dates of work performed, daily hours worked, total hours worked, labor rates, labor burden rates, overtime or premium time charges. Further, the Contractor must make available for inspection and copying to the Engineer the following listed documentation.

1. Certified payroll reports for the period of work claimed.
2. Accounting of Fringe Benefits – certified by a CPA.
3. Contractor's and Subcontractor's daily field reports and daily diaries.

B. Materials:

For all materials for which compensation is requested, if any, total quantities of materials, prices, extensions and transportation costs must be provided on a daily basis. Further, the Contractor must make available for inspection and copying to the Engineer the following listed documentation.

1. Invoices for all materials incorporated.
2. Weigh tickets.
3. Purchase orders.

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4. Delivery schedules.
5. Quotes or proposals from manufacturers or supplier.
6. Freight bills, Bills of Lading, or other documentation to show transportation costs.
7. Restocking charges-invoices from vendor.

C. Equipment:

For all equipment, the Contractor must provide the Engineer with the designation, dates and hours of usage, dates and hours of standby, if any, daily hours, total hours, rental rates and extension for each unit of equipment and machinery. Rental rates will be as established in Section III. Further, the Contractor must make available for inspection and copying to the Engineer the following listed documentation.

1. Owned:
 - a. Purchase contracts(s).
 - b. Depreciation schedule(s).
 - c. Invoices for fuel, lube, repairs and other operating costs.
2. Leased:
 - a. Lease agreement with hourly rate, overtime rate, double shift rate, etc.
 - b. Invoices or other documentation showing hours worked on a daily basis.

D. Subcontractors/Owner-Operators:

In the event the Contractor submits a claim which includes requests for compensation for Subcontractors of Owner-Operators, the same information requested of the Contractor must be provided by the Subcontractor/Owner-Operator. Further, the Contractor must make available for inspection and copying to the Engineer the following listed documentation.

1. Bid/Estimate work sheets and/or spreadsheets.
2. Subcontract Agreements or Agreements with Owner-Operator.
3. All invoices and billing statements received from the Subcontractor/Owner-Operator which relates to the amount requested.

E. Miscellaneous:

Further, the Contractor must make available for inspection and copying to the Engineer the following listed documentation.

1. Evidence of payment for bonds and insurance premiums (MAG 109.5.6).
2. Taxes – unless the Contractor can show otherwise, taxes are reimbursable at 65% of the total cost (less bonds and insurance).

V. TIME LIMIT ON SUBMISSIONS OF CLAIM FOR DELAY OR IMPACT DAMAGES:

No claims for delay or impact damages will be considered or allowed more than 45 days after the event or occurrence which the Contractor claims gives rise to the delay or impact. In no event will a

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claim for delay or impact damages be considered after submission by the Contractor of the Final Payment Request.

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COST REDUCTION INCENTIVE PROPOSALS FOR DESIGN BID BUILD AGREEMENTS

The Contractor may submit to the Engineer proposals for modifying the Plans, Specifications, or other requirements of the Agreement for the sole purpose of reducing the total cost of Project construction. The proposals must not impair in any manner the essential functions or characteristics of the project; including but not limited to service life, economy of operations, ease of maintenance, desired appearance, compatibility with existing or planned equipment, standardization of systems, or design and safety standards.

It must not be inferred from this Policy that the Engineer is required to consider any proposal submitted.

Submissions that propose changes in the basic design of a bridge, propose changes in pipe line size, materials, bedding conditions, pipe specifications; or that propose any change in pavement design will not be considered.

Proposals submitted pursuant to this Policy will be identified as Cost Reduction Incentive Proposals. They must be submitted in writing and, at a minimum, contain the following.

1. Complete the attached or similar cost reduction incentive proposal form.
2. A description of both the existing Agreement Requirements for performing the work and the proposed changes.
3. All Engineering Drawings and computations necessary for the thorough and expeditious evaluation.
4. An itemization of the existing Agreement Requirements that must be changed if the Proposal is adopted and a recommendation as to the manner in which the change should be made.
5. A detailed estimate of the cost of performing the Work under the existing Agreement and under the proposed changes, including the cost of developing and implementing the changes.
6. The Agreement items affected by the proposed changes and any variations in quantities resulting from the changes.
7. An objective estimate of any effects the proposal will have on collateral cost to the City, costs of related items, and cost of maintenance and operation.
8. A statement as to the effect that the Proposal will have on the time for the completion of the Project.
9. A statement as to the time by which a Change Order adopting the Proposal must be executed or when the Engineer must have given verbal approval.

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Proposals will be processed expeditiously; however, the City will not be liable for any delay in acting upon any Proposal nor for any failure to accept any Proposal pursuant to this Special Provision.

The Engineer will be the sole judge of the acceptability of a Proposal and of the estimated net savings in construction costs from the adoption of all or any part of the Proposal. The Contractor will be notified in writing by the Engineer as to whether his/her Proposal has been accepted. The decision by the Engineer is final.

When the City deems such action to be appropriate, it reserves the right to require the Contractor to share equally in the cost to the City of investigating, evaluating, and processing the proposal as a condition for the consideration of such Proposal. Such cost must be shared whether the Proposal is accepted or rejected. When such a condition is imposed, the City will estimate these costs and the Contractor must indicate his acceptance thereof in writing. Such acceptance will authorize the City to deduct the Contractor's share of the costs from any monies due or that may become due to the Contractor under the Agreement.

If the Contractor's Proposal is accepted in whole or in part, the necessary Agreement Modifications and Agreement Price Adjustments will be affected by the execution of a Change Order which will specifically state that it is executed pursuant to this Special Provision.

The Contractor must continue to perform the work in accordance with the requirements of the Agreement until a Change Order incorporating the Proposal has been executed or until he/she has been given verbal approval by the Engineer that his/her Proposal has been accepted. If the Change Order has not been executed or he/she has not been given verbal approval on or before the date specified on the attached cost reduction incentive proposal form or on or before such other date as the Contractor may have subsequently specified in writing, the Proposal may be deemed to be rejected.

The executed Change Order will incorporate the changes in the Plans, Specifications, or other requirements of the Agreement which are necessary to permit the Proposal, or such part of it which has been accepted, to be put into effect, and will include any condition – upon which the City's approval thereof is based, if such approval is conditional. The executed Change Order may also extend the time for the completion of the Agreement if such an extension has been deemed to be warranted by the Engineer as a result of his evaluation of the Proposal.

The executed Change Order will also establish the estimated net savings in the cost of performing the Work attributable to the Proposal effectuated by the Change Order. In determining the net savings, the right is reserved to the Engineer to disregard the Agreement bid prices if, in his/her judgment, such prices do not represent a fair measure of the value of the Work to be performed or to be deleted. The net savings will be established by determining the Contractor's cost of performing the Work, taking into account his/her cost of developing the Proposal and implementing the change, and reducing this amount by any ascertainable collateral costs to the City. The executed Change Order may provide that the Contractor be paid 50 percent of the estimated net savings amount.

The executed Change Order may also provide for the adjustment in Agreement prices. Agreement prices may be adjusted by subtracting the City's share of the accrued net savings.

The amount specified to be paid to the Contractor in the executed Change Order which effectuates a Cost Reduction Proposal will constitute full compensation to the Contractor for the Cost Reduction

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Proposal and the performance of the work thereof pursuant to the said Change Order.

Upon acceptance of a Cost Reduction Incentive Proposal, any restrictions imposed by the Contractor on its use or on disclosure of the information will become void, and the City thereafter will have the right to use all or any part of the Proposal without obligation or compensation of any kind to the Contractor.

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Appendix 2

COST REDUCTION INCENTIVE PROPOSAL FORM

TO: CIP City Engineer

FROM:

PROJECT NAME: RECLAIMED WATER PIPE EXTENSION – GERMANN ROAD AND HAMILTON STREET
CITY PROJECT NUMBER: WW2206.404

DATE:

Summary of Change (Brief description of proposed change including advantages and disadvantages):

ESTIMATED COST SUMMARY (Attached detailed estimate):

A.	Original Cost:	\$	
B.	Proposed Cost:	\$	
C.	Construction Savings (A-B):	\$	
D.	Gross Savings (Included OH %, Bond %)	\$	
E.	Contractor Implementing	\$	
F.	City Implementing Cost:	\$	
	Reduction in Agreement Price (C+D-E-F) x 50%:	\$	

Date by which a Change Order must be issued so as to obtain maximum cost reduction:

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Appendix 3

**CITY OF CHANDLER, ARIZONA
PUBLIC WORKS & UTILITIES DEPARTMENT**

CONTRACTOR'S AFFIDAVIT REGARDING SETTLEMENT OF CLAIMS

_____, Arizona
Date _____

Project Name: RECLAIMED WATER PIPE EXTENSION – GERMANN ROAD AND HAMILTON STREET
City Project No.: WW2206.404

To the City of Chandler, Arizona

Gentlemen:

This is to certify that all lawful claims for materials, rental of equipment and labor used in connection with the construction of the above project, whether by subcontractor or claimant in person, have been duly discharged.

The undersigned, for the total compensation of \$_____, as set out in the final pay application, as full and complete payment under the terms of the Agreement, hereby waives and relinquishes any and all further claims or right of lien under, in connection with, or as a result of the above described project. The undersigned further agrees to indemnify and save harmless the City of Chandler against any and all liens, claims or liens, suits, actions, damages, charges and expenses whatsoever, which said City may suffer arising out of the failure of the undersigned to pay for all labor performances and materials furnished for the performance of said installation.

Signed and dated at _____, this _____ day of _____ 20____.

CONTRACTOR

By _____

STATE OF ARIZONA)
) SS
COUNTY OF MARICOPA)

The foregoing instrument was subscribed and sworn to before me this _____ day of _____ 20_____.

Notary Public

My Commission Expires

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Appendix 4

PERFORMANCE BOND

ARIZONA STATUTORY PERFORMANCE BOND
PURSUANT TO TITLES 28, 34, AND 41, ARIZONA REVISED STATUTES
(Penalty of this bond must be 100% of the Agreement amount)

KNOW ALL MEN BY THESE PRESENTS THAT: _____

(hereinafter "Principal"), and _____ (hereinafter "Surety"), a corporation organized and existing under the laws of the State of _____ with its principal office in the City of _____, holding a certificate of authority to transact surety business in Arizona issued by the Director of Insurance pursuant to Title 20, Chapter 2, Article 1, as Surety, are held and firmly bound unto _____ (hereinafter "Obligee") in the amount of _____ (Dollars) (\$ _____), for the payment whereof, Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Agreement with the Obligee, dated the _____ day of _____, 20__ for construction of **RECLAIMED WATER PIPE EXTENSION - GERMANN ROAD AND HAMILTON STREET, City Project No. WW2206.404** which Agreement is hereby referred to and made a part hereof as fully and to the same extent as if copies at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the Principal faithfully performs and fulfills all the undertakings, covenants, terms, and conditions of the Agreement during the original term of the Agreement and any extension of the Agreement, with or without notice of the Surety, and during the life of any guaranty required under the Agreement, and also performs and fulfills all the undertakings, covenants, terms, conditions, and agreements of all duly authorized modifications of the Agreement that may hereafter be made, notice of which modifications to the Surety being hereby waived, the above obligation is void. Otherwise it remains in full force and effect.

PROVIDED, HOWEVER that this bond is executed pursuant to the provisions of Title 34, Chapter 2, Article 2, Arizona Revised Statutes, and all liabilities on this bond will be determined in accordance with the provisions of Title 34, Chapter 2, Article 2, Arizona Revised Statutes, to the same extent as if it were copied at length in this Agreement.

The prevailing party in a suit on this bond may recover as part of the judgment reasonable attorney fees that may be fixed by a judge of the court.

Witness our hands this _____ day of _____, 20__.

AGENT OF RECORD

PRINCIPAL SEAL

By _____

SURETY SEAL

AGENT ADDRESS

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Appendix 5

PAYMENT BOND

ARIZONA STATUTORY PAYMENT BOND
PURSUANT TO TITLES 28, 34, AND 41, OF THE ARIZONA REVISED STATUTES
(Penalty of this Bond must be 100% of the Agreement amount)

KNOW ALL MEN BY THESE PRESENTS THAT:_____

(hereinafter "Principal"), as Principal, and _____(hereinafter "Surety"), a corporation organized and existing under the laws of the State of _____ with its principal office in the City of _____, holding a certificate of authority to transact surety business in Arizona issued by the Director of the Department of Insurance pursuant to Title 20, Chapter 2, Article 1, as Surety, are held and firmly bound unto _____ (hereinafter "Obligee") in the amount of _____ (Dollars) (\$_____), for the payment whereof, the Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Agreement with the Obligee, dated the _____ day of _____, 20__ for construction of **RECLAIMED WATER PIPE EXTENSION - GERMANN ROAD AND HAMILTON STREET, City Project No. WW2206.404** which Agreement is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the Principal promptly pays all moneys due to all persons supplying labor or materials to the Principal or the Principal's subcontractors in the prosecution of the work provided for in said Agreement, this obligation is void. Otherwise it remains in full force and effect.

PROVIDED, HOWEVER that this bond is executed pursuant to the provisions of Title 34, Chapter 2, Article 2 Arizona Revised Statutes, and all liabilities on this bond will be determined in accordance with the provisions, conditions and limitations of Title 34, Chapter 2, Article 2, Arizona Revised Statutes, to the same extent as if it were copied at length in this Agreement.

The prevailing party in a suit on this bond may recover as part of the judgment reasonable attorney fees that may be fixed by a judge of the court.

Witness our hands this _____ day of _____, 20__.

_____	PRINCIPAL	SEAL
AGENT OF RECORD		
	By _____	
	SURETY	SEAL

AGENT ADDRESS		

DISPUTE RESOLUTION**A. INFORMAL DISPUTE RESOLUTION**

The parties to the Agreement agree that time is of the essence in relation to performance of the Agreement and completion of the Project, therefore any and all disputes in relation to the Agreement will initially be referred to the Project Manager, the Design Professional Representative and/or the Contractor Representative as applicable to the dispute, for immediate resolution. If, after good faith efforts to reach a resolution, none is reached, any party to the dispute may submit the dispute to the Dispute Resolution Representative ("DRR") process set forth below, which is intended to be an expedited process.

B. DISPUTE RESOLUTION REPRESENTATIVE ("DRR") PROCESS

1. The Parties under the Agreement agree that all claims and disputes in relation to the Project which are not resolved in the ordinary course of the Project ("Claim" or "Claims") will, as a prerequisite to any mediation, or litigation of the Claim, first be submitted for resolution between the designated Dispute Resolution Representatives of the Parties as set forth herein (the "DRR Process").
2. The DRR Process will be initiated through service of a DRR Notice as set forth below:
 - a. For claims by the Contractor or the Design Professional, the DRR Process will be initiated by the party asserting the claim serving written notice on the City setting forth in detail: (i) the basis for the claim; (ii) the effect of the Claim upon the construction of, and/or Project Schedule for, the Project; (iii) the specific relief requested, the amount thereof, and how such was calculated; (iv) the parties involved in the Claim, and how they are involved; (v) the specific Agreement provisions in the Agreement Documents (including, if applicable, drawings and specifications) which apply; and (vi) efforts made to date to resolve the Claim.
 - b. For claims by the City, the DRR process will be initiated by the City providing written notice to the other parties of the basis and amount of its claim, the parties involved in the Claim, and how they are involved, the provisions in the Agreement Documents that apply, and the relief requested.
 - c. The DRR Notice will be hand-delivered and e-mailed to the other parties' designated Dispute Resolution Representatives.
3. The other parties will respond in writing to the DRR Notice ("DRR Response") within ten (10) calendar days of receipt of the DRR Notice, setting forth those items set forth in the DRR Notice that they agree with, dispute, and/or have questions concerning. The DRR Response will be hand-delivered and e-mailed to the other parties' Dispute Resolution Representatives.

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4. The designated Dispute Resolution Representatives for the Parties to the claim will then meet as soon as possible and in any event within twenty (20) calendar days of submission of the DRR Notice (regardless of whether a DRR Response has been submitted by all parties involved in the dispute), at a mutually agreed upon time and place, to attempt to resolve the Claim based upon the DRR Notice and DRR Response.
5. At any time after the first meeting required above, either party may terminate the DRR Process by written notice to the other party.
6. The parties may agree, in writing, to extend or modify the time limits or other provisions of the DRR process in relation to a specific pending Claim.
7. Unless otherwise designated in a written notice to the other parties, the City and the representatives of the Contractor and of the Design Professional will act as the parties' designated Dispute Resolution Representatives.
8. If a resolution of the Claim is reached, that resolution must be set forth in writing and must be signed by the Parties' designated Dispute Resolution Representative. If the resolution involves a change in any Agreement Documents, the Agreement Price, the Project Schedule, or any other change requiring a written Change Order or Amendment, the parties must execute an appropriate written Change Order or Amendment pursuant to the terms of the Agreement Documents.

C. MEDIATION

1. Unless extended by written agreement of the parties involved in the dispute, any Claim not resolved through the DRR process set forth above within five (5) calendar days after the meeting required under B (4) above, or after the DRR is terminated pursuant to B (5) above, whichever is earlier, will be submitted to mediation as a condition precedent to litigation by either party.
2. The mediation will be commenced by written demand upon the other party for mediation. If the parties cannot agree upon a mediator within ten (10) calendar days of the written demand, either party may make a request to the Civil Presiding Judge of the Maricopa County Superior Court to appoint a mediator. The mediation will occur within forth (40) calendar days of the written demand for mediation, unless the parties agree, in writing, to a longer period of time.
3. The qualifications for the mediator will be that he/she be: (a) an experienced mediator, arbitrator or litigator of construction disputes; and (b) having engaged a significant portion of his/her time involving and/or resolving construction disputes for at least the past five (5) years.
4. Each party will provide to the other party and the mediator all of the information and documentation required under B(1) and (2) above, together with any additional information and documentation which the party believes relevant. In addition, the parties will exchange, and provide to the mediator such additional memoranda, information and/or documentation, as the

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mediator may request, and in the form and at such times, as the mediator may direct.

5. The parties will share the mediator's fee and any filing fees equally. The mediation will be held in Chandler, Arizona, unless another location is mutually agreed upon. Agreements reached in mediation will be specifically enforceable in any court having jurisdiction thereof.

D. LITIGATION

Any claim arising out of or related to the Agreement, except Claims relating to aesthetic effect and except those claims waived as provided for in the Agreement Documents, must be resolved through litigation in the Maricopa County, Arizona Superior Court.

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CITY OF CHANDLER, ARIZONA
PUBLIC WORKS & UTILITIES DEPARTMENT

CERTIFICATE OF COMPLETION

PROJECT NAME:	RECLAIMED WATER PIPE EXTENSION – GERMANN ROAD AND HAMILTON STREET		
CITY PROJECT NO.:	WW2206.404		
If Federally Funded:			
FEDERAL NO.:		ADOT NO:	

(This section to be completed by Prime)

I HEREBY CERTIFY THAT ALL GOODS AND/OR SERVICES REQUIRED BY CITY OF CHANDLER FOR THIS PROJECT HAVE BEEN DELIVERED IN ACCORDANCE WITH THE AGREEMENT DOCUMENTS AND BID SPECIFICATIONS AND ALL ACTIVITIES REQUIRED BY THE AGREEMENTOR UNDER THE AGREEMENT HAVE BEEN COMPLETED AS OF THE COMPLETION DATE LISTED HERE:

<u>FINAL ACCEPTANCE DATE:</u>	
--------------------------------------	--

PRIME CONTRACTOR:

FIRM NAME:			
PRINCIPAL:			
TITLE:			
SIGNATURE:		DATE:	

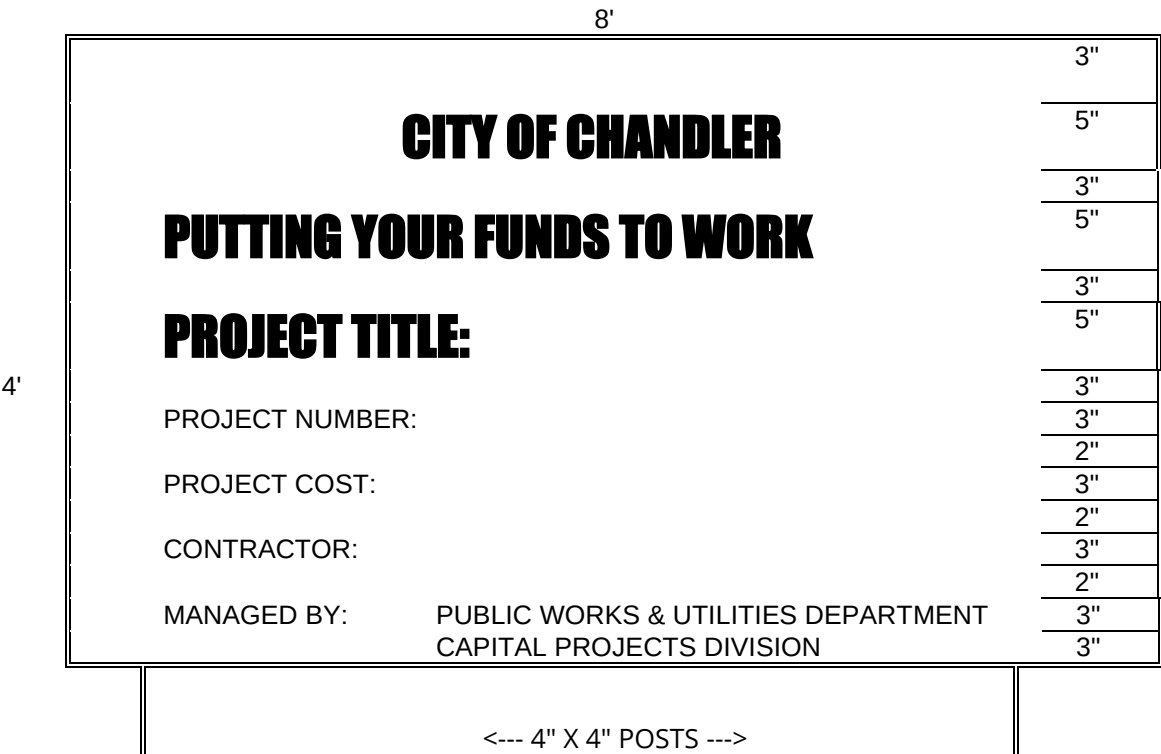
CERTIFIED BY **[INSERT NAME AND TITLE OF PARTY THAT OVERSEES CONSTRUCTION]:**

FIRM NAME:			
SIGNATURE:		DATE:	

PROJECT ACCEPTED BY CITY OF CHANDLER:

NAME:			
SIGNATURE:		DATE:	

CONSTRUCTION SIGN DETAIL



NOTES:

SIGN(S) MUST BE FURNISHED AND ERECTED PRIOR TO COMMENCEMENT OF CONSTRUCTION. POSTS MUST BE ANCHORED A MINIMUM OF TWO FEET INTO THE GROUND. BOTTOM OF SIGN MUST BE A MINIMUM OF FOUR FEET ABOVE THE GROUND.

TYPICAL PROJECT IDENTIFICATION SIGN FOR GENERAL PROJECTS MUST BE NON-REFLECTORIZED GREEN BACKGROUND, AND NON-REFLECTORIZED WHITE LETTERS AND NUMERALS.

ONE SIGN MUST BE ERECTED FOR BUILDINGS AND OTHER LIMITED AREA SINGLE SITES. FOR MULTIPLE SITES, ONE SIGN MUST BE ERECTED AT EACH SITE.

FOR LINEAR PROJECTS ONE HALF MILE OR LONGER, PLACE ONE SIGN AT EACH END OF THE PROJECT.

COST OF THE WORK

(APPLICABLE SOLELY TO CONSTRUCTION MANAGER AT RISK AND JOB ORDER CONTRACTING)

SECTION 1 – COSTS TO BE REIMBURSED

1.1 Cost of the Work

The term Cost of the Work will mean costs necessarily incurred by Contractor in the proper performance of the Work. Such costs must be at rates not higher than the standard paid at the place of the Project except with prior consent of City. The Cost of the Work will include only the items set forth in this Section 1.

1.2 Labor Costs

- 1.2.1 Wages of construction workers directly employed by the Contractor to perform the construction of the Work at the site or, with City's approval, at off-site workshops. Cost to be reimbursed will be the actual wages paid to the individuals performing the work.
- 1.2.2 Wages or salaries of the Contractor's supervisory and administrative personnel when stationed at the site with City's approval. No Contractor personnel stationed at the Contractor's home or branch offices will be charged to the Cost of the Work. Non-field office based Contractor management and support personnel are expected to provide service and advice from time to time throughout the job and his/her time devoted to Project matters is considered to be covered by the Contractor's Fee.
- 1.2.3 Wages and salaries of Contractor's supervisory or administrative personnel who would normally be stationed at the field office in accordance with Section 1.2.2 but who become engaged, at factories, workshops or on the road, in expediting the production or transportation of materials or equipment required for the Work, but only for that portion of his/her time required for the Work. Employee bonuses and/or costs associated with Employee Stock Ownership Plans ("ESOP") will not be considered reimbursable labor or labor burden costs and will be considered non-reimbursable costs considered to be covered by the Contractor's Fee.
- 1.2.4 Costs paid or incurred by Contractor for taxes, insurance, contributions, assessments and benefits required by law or collective bargaining agreements and, for personnel not covered by such agreements, customary benefits such as sick leave, medical and health benefits, holiday, vacations and pensions, provided such costs are based on wages and salaries included in the Cost of the Work under Subparagraphs 1.2.1 through 1.2.3.
 - 1.2.4.1 Cost of the Work will include the actual net cost to Contractor for worker's compensation insurance attributable to the wages chargeable to the Cost of Work per this Agreement. The actual net cost of worker's compensation must take into consideration all cost adjustments due to experience modifiers, premium discounts, policy dividends, retrospective rating plan premium adjustments, assigned risk pool rebates, any applicable weekly maximums, etc. Contractor may charge an estimated amount for worker's compensation insurance costs, but will make appropriate cost adjustments to actual costs within 45 days of receipt of actual cost adjustments from the insurance carrier.

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- 1.2.4.3 Overtime wages paid to salaried personnel (if approved in advance in writing by City) will be reimbursed at the actual rate of overtime pay paid to the individual. No time charges for overtime hours worked on the Project will be allowed if the individual is not paid for the overtime worked.
- 1.2.4.4 Any overtime premium or shift differential expense to be incurred by Contractor for hourly workers will require City's advance written approval before the incremental cost of the overtime premium or shift differential will be considered a reimbursable cost. If the Contractor is required to work overtime as a result of an inexcusable delay or other coordination problems caused by the Contractor or anyone he/she is responsible for, the overtime premium and/or shift differential expense portion of the payroll expense and related labor burden costs will be considered as cost not to be reimbursed.
- 1.2.4.5 Reimbursable labor burden costs will be limited to payroll taxes, worker's compensation insurance, the employer's portion of union benefit costs for union employees working on the Project, and the actual verifiable fringe benefit costs incurred by Contractor for non-union individuals working on the Project subject to the following maximum percentages for the following reimbursable non-union fringe benefit costs. The following maximums (as a percentage of reimbursable actual wages by individual) will apply for each of the following types of fringe benefit costs specifically attributable to each of the non-union personnel working on the Project:

- | | |
|--|--------|
| • Medical Insurance, Dental, Life & AD&D Insurance: | 12.00% |
| • Holiday, vacation and other paid time not worked: | 10.00% |
| • Pension Plan Contributions to Vested Employee Account, Simplified Employee Pension Plans, or 401K matching plans
(Note: ESOP related costs are covered by the Contractor Fee) | 10.00% |

For non-union personnel, no other fringe benefit costs (other than the three specific categories listed immediately above, will be considered reimbursable Cost of Work. Any labor burden costs that are in excess of the amounts considered reimbursable or are otherwise not considered reimbursable under the terms of this agreement are intended to be covered by the Contractor Fee.

1.3 Subcontract Costs

- 1.3.1 Payments made by Contractor to Subcontractors in accordance with the requirements of the subcontracts.
- 1.3.2 For Scope of Work Bid Packages typically performed by Subcontractors, Contractor may "self-perform" such work on an actual cost basis subject to an agreed upon Guaranteed Maximum Price for the "self-performed work". The Contractor must, unless agreed to by City in writing, bid his/her proposed guaranteed Maximum Price for the work to be "self-performed" against at least three other interested trade Contractors. All savings under any such Subcontract for "self-performed work" must be applied to reduce the Cost of Work under the Agreement and the Guaranteed Maximum Price. For purposes of defining "self-performed work" subject to this provision, any division of Contractor, or any separate Contractor or Subcontractor that is partially owned or wholly owned by the Contractor or any of his/her employees or employee's relatives will be considered a related party entity and will be subject to this provision regarding "self-performed work". No self-performed work will

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be allowed to be performed on a Fixed Price basis.

- 1.3.3 Contractor (with respect to its Suppliers, Subcontractors and all lower tier Subcontractors) must provide City advance written notice and must obtain City's approval for any proposed Subcontract Change Order, Material Purchase Order, or other financial commitment in an amount in excess of \$5,000 prior to placing such order or entering into such agreement (regardless of whether or not any such commitment will affect the prime Agreement Guaranteed Maximum Cost). It is agreed that sums applicable to any Subcontract Change Order, Purchase Order or other financial commitment entered into in violation of the above notice and approval requirement will not be included in the amounts owing to Contractor, Subcontractors or Suppliers whether as Costs of the Work or as reasonable termination costs in the event of termination.

1.4 Costs of Material and Equipment Incorporated in the Completed Construction

- 1.4.1 Costs, including transportation and storage, of materials and equipment incorporated or to be incorporated in the completed construction.
- 1.4.2 Costs of materials described in the preceding Subparagraph 1.4.1 in excess of those actually installed to allow for reasonable waste and spoilage. Unused excess materials, in any, will become City's property at the completion of the Work or, at City's option, may be sold by the Contractor. Any amounts realized from such sales must be credited to City as a deduction from the Cost of Work.
- 1.4.3 Proceeds from the sale of recyclable materials, scrap, waste, etc. will be credited to job cost.

1.5 Costs of Other materials and Equipment, Temporary Facilities and Related Items

- 1.5.1 Costs, including transportation and storage, installation, maintenance, dismantling and removal of materials, supplies, temporary facilities, machinery, equipment and hand tools not customarily owned by construction workers, that are provided by the Contractor at the site and fully consumed in the performance of the Work; and cost (less salvage value) of such items if not fully consumed, whether sold to others or retained by Contractor. Cost for items previously used by Contractor will mean fair market value.
- 1.5.2 Rental charges for temporary facilities, machinery, equipment, and hand tools not customarily owned by construction workers that are provided by Contractor at the site, whether rented from Contractor or others, and costs of transportation, installation, minor repairs and replacements, dismantling and removal thereof. Rates and quantities of equipment rented will be subject to City's prior written approval.
- 1.5.2.1 The Projected usage for each piece of equipment to be rented for use on the Project and the estimated total rentals must be considered by Contractor before the piece of equipment is rented so that an appropriate rent versus buy decision can be made. Purchased equipment must be considered "job owned". At the completion of the Project, Contractor must transfer title and possession of all remaining job-owned equipment to City, or Contractor may keep any such equipment for an appropriate fair market value credit to job cost, which will be mutually agreed to by City and Contractor.
- 1.5.2.2 Each piece of equipment to be rented must have hourly, daily, weekly and monthly rates and

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the most economical rate available will be reimbursed based on the circumstances of actual need and usage of the piece of equipment while it is stationed at the jobsite. When the piece of equipment is no longer needed for the work, no rental charges will be reimbursed if the piece of equipment remains at the jobsite for the convenience of Contractor.

1.5.2.3 Equipment Rental Rates

1.5.2.3.1 Compensation for equipment used on the Project will be paid in accordance with the Equipment Plan submitted by Contractor in the accepted GMP Proposal and no payments will be made in excess of the rates set forth in the Equipment Plan, or actual documented costs, whichever is less.

1.5.2.3.2 All equipment rental rates and costs are subject to City's right to audit when submitted as part of Equipment Plan and/or at any time during the Project.

1.5.2.4 The aggregate rentals chargeable for each piece of Contractor owned tools or equipment must not exceed 50% of the fair market value of such equipment at the time of its commitment to the Work. The original purchase price and date of purchase of the equipment will be documented with a copy of the purchase invoice for the piece of equipment. Such aggregate limitations will apply and no further rentals will be charged even if a piece of equipment is taken off the job and is later replaced by a similar piece of equipment. For purposes of computing the aggregate rentals applicable to aggregate rental limitations, rental charges for similar pieces of equipment will be combined if the pieces of equipment were not used at the same time.

1.5.2.5 Fair market value for used material and equipment as referred to in the Agreement Documents will mean the estimated price a reasonable purchaser would pay to purchase the used material or equipment at the time it was initially needed for the job. Note: This is usually lower than the price a reasonable purchaser would pay for similar new construction material or construction equipment.

1.5.2.6 All losses resulting from lost, damaged or stolen tools and equipment will be the sole responsibility of Contractor, and not City, and the cost of such losses will not be reimbursable under the Agreement.

1.5.2.7 Contractor will be required to maintain a detailed equipment inventory of all job-owned equipment (either purchased and charged to job cost or job-owned through aggregate rentals) and such inventory must be submitted to City each month. For each piece of equipment, such inventory should contain at a minimum (1) original purchase price or acquisition cost (2) acquisition date (3) approved Fair Market Value at the time the piece of equipment was first used on the job and (4) final disposition.

1.5.2.8 All costs incurred for minor maintenance and repairs will be reimbursed at actual cost. Such costs include routine and preventative maintenance, minor repairs and other incidental costs. Repairs and/or replacement of a capital nature are considered to be covered by the rental rates. Major repairs and overhauls are not considered routine and ordinary; consequently such costs are not reimbursable and are intended to be covered by the rental rates.

1.5.3 Costs of removal of debris from the Site.

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- 1.5.4 Costs of document reproductions, facsimile transmissions and long-distance telephone calls, postage and parcel delivery charges, telephone service at the site and reasonable petty cash expenses of the site office.
- 1.5.5 That portion of the reasonable expenses of Contractor's personnel incurred while traveling in discharge of duties connected with the Work.
 - 1.5.5.1 No travel expenses will be reimbursed to Contractor's representatives unless Project related travel required them to travel to a destination more than 100 miles from the Project location. Any travel involving airfare will require advance written approval by an authorized City's representative.
- 1.5.6 Costs of materials and equipment suitably stored off the site at a mutually acceptable location, if approved in advance by the City.
- 1.5.7 Reproduction costs will be the actual costs of reproduction subject to a maximum of five cents (\$.05) per square foot for prints and a maximum of five cents (\$.05) per 8 ½ by 11-inch page for offset print or photo copied agreement documents, specifications, etc. Telephone costs will be the actual costs paid to the third party telephone company for the field office telephone.

1.6 Miscellaneous Costs

- 1.6.1 That portion of insurance and bond premiums that can be directly attributed to the Agreement. The City will reimburse Contractor for contractually required bond at time of first pay application for GMP and Cost-Based Agreements upon receipt of proof of payment from the Contractor. If the Contractor completes Work for less than the Agreement Price, Contractor must credit the City a pro-rated amount for the unused portion of the bond payment
 - 1.6.1.1 Contractor's actual cost for insurance will be considered to be included within the Maximum limit for General Conditions Costs. All premiums for any insurance and bonds required for the Project must reflect the net actual costs to Contractor after taking into consideration cost adjustments due to experience modifiers, premium discounts, policy dividends, retrospective rating plan premium adjustments, assigned risk pool rebates, refunds, etc.
 - 1.6.1.2 The amount to be reimbursed to Contractor for all contractually required insurance will be actual costs not to exceed a total of 2% of the Agreement Value, unless Contractor establishes to City's satisfaction that the actual cost is higher and City agrees to such actual higher cost in writing. If Contractor's cost of contractually required insurance is greater than the amount agreed to be reimbursed per this Agreement Provision, the difference will be considered to be covered by the Contractor's Fee. The City will reimburse Contractor for contractually required insurance on a monthly basis for GMP and Cost-Based Agreements. If Contractor can demonstrate substantial savings by paying for all insurance in advance, the City may agree to reimburse all insurance costs at time of first pay application for GMP and Cost-Based Agreements with proof of payment from Contractor.
- 1.6.2 Sales, use or similar taxes imposed by a governmental authority that are related to the Work.

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- 1.6.3 Fees and assessments for the building permit and for other permits, licenses and inspections for which Contractor is required by the Agreement Documents to pay.
- 1.6.4 Fees of laboratories for tests required by the Agreement Documents, except those related to defective or nonconforming Work and which do not fall within the scope of ¶ 1.7.3 below.
- 1.6.5 Royalties and license fees paid for the use of a particular design, process or product required by the Agreement Documents; the cost of defending suites or claims for infringement of patent rights arising from such requirement of the Agreement Documents; and payments made in accordance with legal judgments against Contractor resulting from such suites or claims and payments of settlements made with City's consent. However, such costs of legal defenses, judgments and settlements must not be included in the calculation of the Contractor's Fee or subject to the Guaranteed Maximum Price.
- 1.6.6 Data processing costs related to the Work. However, any such data processing costs will be limited to the cost of personal computer hardware used at the field office in the normal day to day administration, management and control of the Project. The aggregate charges for any such hardware must not exceed the Fair Market Value of the hardware at the time it was brought to the field office. If the total charges for any particular piece of hardware reach an amount equal to the Fair Market Value, that particular piece of hardware must be turned over to City whenever it is no longer needed for the Project. If Contractor elects to keep the particular piece of hardware, the job costs must be credited with a mutually agreeable amount which will represent the Fair Market Value of the particular piece of hardware at the time it was no longer needed for the job. Software or other costs associated with the use of computer programs will not be considered to be a reimbursable cost and will be considered to be covered by the Contractor's Fee.
- 1.6.7 Deposits lost for causes other than Contractor's negligence or failure to fulfill a specific responsibility to City as set forth in the Agreement Documents.
- 1.6.8 Legal, mediation and arbitration costs, including attorneys' fees, other than those arising from disputes between City and Contractor, reasonably incurred by Contractor in the performance of the Work and with City's prior written approval; which approval will not be unreasonably withheld.
- 1.6.9 Expenses incurred in accordance with Contractor's standard personnel policy for relocation and temporary living allowances of personnel required for the Work, if pre-approved by City in writing. If City authorizes the reimbursement of relocation costs, the reimbursable relocation expenses will be limited to a maximum of \$50,000 per person. Any relocation cost incurred by Contractor in excess of the amount reimbursed by City will be considered to be covered by the Contractor's Fee.

1.7 Other Costs and Emergencies

- 1.7.1 Other costs incurred in the performance of the Work if and to the extent approved in advance in writing by City.
- 1.7.2 Costs due to emergencies incurred in taking action to prevent threatened damage, injury or

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loss in case of an emergency affecting the safety of persons and property.

- 1.7.3 Costs of repairing or correcting damaged or nonconforming Work executed by Contractor, Subcontractors or Suppliers, provided that such damaged or nonconforming Work was not caused by negligence or failure to fulfill a specific responsibility of Contractor and only to the extent that the cost of repair or correction is not recoverable by Contractor from insurance, sureties, Subcontractors or Suppliers.

1.8 Related Party Transactions

- 1.8.1 The term “related party” will mean a parent, subsidiary, affiliate or other entity having common ownership or management with Contractor; any entity in which any stockholder in, or management employee of, Contractor owns any interest in excess of ten percent in the aggregate; or any person or entity which has the right to control the business or affairs of Contractor. The term “related party” includes any member of the immediate family of any person identified above.
- 1.8.2 If any of the costs to be reimbursed arise from a transaction between Contractor and a related party, Contractor must notify City in writing of the specific nature of the contemplated transaction, including the identity of the related party and the anticipated cost to be incurred, before any such transaction is consummated or cost incurred. If City, after such notification, authorizes in writing the proposed transaction, then the cost incurred will be included as a cost to be reimbursed, and Contractor must procure the Work, equipment, goods or service from the related party, as a Subcontractor. If City fails to authorize the transaction, Contractor must procure the Work, equipment, goods or service from some person or entity other than a related party.

SECTION 2 – COSTS NOT TO BE REIMBURSED

- 2.1 The Cost of Work must not include:
- 2.1.1 Salaries and other compensation of Contractor’s personnel stationed at Contractor’s principal office or offices other than the site office, except as specifically provided in Subparagraphs 1.2.2 and 1.2.3.
- 2.1.2 Expenses of Contractors’ principal office and offices other than the site office.
- 2.1.3 Overhead and general expenses, except as may be expressly included in Section 1.
- 2.1.3.1 Costs of Contractor’s home office computer services or other outside computer processing services will be considered overhead and general expense. Accordingly, Contractor should not plan to perform any such computer related services or alternatives at the field office when such services or functions can be performed at Contractor’s home or branch offices, or other outside service locations.
- 2.1.4 Contractor’s capital expenses, including interest on Contractor’s capital employed for the Work.
- 2.1.5 Rental costs of machinery and equipment, except as specifically provided in subparagraph 1.5.2.

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- 2.1.6 Except as provided in Subparagraph 1.7.3 of the Agreement, costs due to the negligence or failure to fulfill a specific responsibility of Contractor, Subcontractors and Suppliers or anyone directly or indirectly employed by any of them or for whose acts of them may be liable.
- 2.1.7 Any cost not specifically and expressly described in Section 1.
- 2.1.8 Costs, other than costs included in Change Orders approved by City that would cause the GMP to be exceeded.

SECTION 3 – DISCOUNTS, REBATES, REFUNDS AND SAVINGS

- 3.1 Cash discounts obtained on payments made by Contractor will accrue to City if (1) before making the payment, Contractor included them in an Application for Payment and received payment therefore from City, or (2) City has deposited funds with Contractor with which to make payments; otherwise, cash discounts will accrue to Contractor. Trade discounts, rebates, refunds and amounts received from sales or surplus materials and equipment will accrue to City, and Contractor must make provisions so that they can be secured.
- 3.1.1 Cost of the Work will be credited with all insurance policy discounts, performance and payment bond rebates or refunds, refunds or return premiums from any Subcontractor default insurance, refunds or rebates from any Contractor controlled insurance programs applicable to the Project, merchandise rebates of any nature, refunds of any nature, insurance dividends; and a portion of any volume rebates or free material credits earned with purchase of material or other goods and services charged to the job.
- 3.1.2 “Cash” discounts which may accrue to Contractor will be limited to a maximum of 1.5% of invoice cost. Any portion of “Cash” discounts greater than 1.5% will automatically accrue to City if Contractor is eligible to take advantage of the discounts.
- 3.2 Amounts that accrue to City in accordance with the provisions of Paragraph 3.1 will be credited to City as a deduction from the Cost of the Work.
- 3.3 Any and all savings on the GMP, or any separately guaranteed items comprising the GMP, will belong to City, subject to any express right in the Agreement for Contractor to share in savings. Savings are subject to City’s right to audit, and may be audited separately.

SECTION 4 – GENERAL CONDITIONS COSTS

- 4.1 General Conditions Costs may include, but are not limited to, the following types of costs incurred by Contractor during construction of the Work to the extent they are reimbursable Costs of the Work as delineated above: payroll costs for Work conducted at the site, payroll costs for the superintendent and full-time general foremen, payroll costs for management personnel resident and working on the site workers not included as direct labor costs engaged in support (e.g. loading/unloading, clean-up, etc.), administrative office personnel, costs of offices and temporary facilities including office materials, office supplies, office equipment, minor expenses, utilities, fuel, sanitary facilities and telephone services at the site, costs of liability insurance premiums not included in labor burdens for direct labor

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costs, costs of bond premiums, costs of consultants not in the direct employ of Contractor or Subcontractors, fees for permits and licenses.

- 4.2 General Conditions Costs may be paid on a percentage of the Agreement Price or on a lump/stipulate sum basis as set forth in the Agreement. All costs included in the General Conditions Costs will not be separately invoiced to or paid by City.
- 4.3 The total amount of General Conditions Costs for the Work may be divided by the number of days allowed for performance of the Work, to determine a fixed daily rate for General Conditions Costs that may be used in computing the General Conditions Costs allocated to any period of time, or for any adjustments in the General Conditions Costs agreed to in writing by City.

LANDSCAPE ESTABLISHMENT PERIOD

Section 1 – Description and General

Contractor is in direct control of work performed under the Landscape Establishment Period. If work is subcontracted, a representative of the Contractor will be present at the site of the work for all hours that the subcontractor works. Subcontracting of Landscape Establishment work will be permitted for weed eradication with herbicides, because of special licensing. A licensed temporary service may be used to supply labor to Contractor if Contractor has received approval from City Representatives. Contractor will submit the required subcontract documentation.

Contractor must provide adequate personnel to accomplish the required maintenance of the plant materials at intervals acceptable to City Representatives.

If not healthy at the end of the maintenance period, the maintenance must be continued until the plant material is approved by City.

1.1 Time and Schedule

Unless otherwise expressly agreed to in writing by City, the Landscape Establishment Period will be per General Conditions Section 6.5.4.

1.2 Planted Stock and Seeding Establishment

- 1.2.1 Tree planting and staking must be per City of Chandler Standard Detail C-801.
- 1.2.2 All trees will stand erect on their own without stakes when brought to this site. If the tree cannot stand on its own when nursery stakes are removed, the tree will be removed and replaced.

1.3 Pre-Emergent Herbicide and Weed Control

- 1.3.1 Contractor will provide three applications of an approved pre-emergent herbicide on all unpaved areas of the project, as directed by City Representatives, to control weed growth in all areas of the project. The number of applications may be increased as directed by the City Representative, and at no additional cost to City, if the City Representative deems additional applications are required to control weed growth.
- 1.3.2 Application sequence will be approved in advance by City. The first application of pre-emergent will be completed prior to the application of Decomposed Granite and will be included with the cost of the Decomposed Granite as specified and part of the Construction Phase portion of work. The second application of pre-emergent will be completed after installation of the Decomposed Granite and no later than half-way through the Landscape Establishment Period. The third and final application of pre-emergent will be applied 15 days prior to completion of the Landscape Establishment portion of the project. The second and third pre-emergent applications will be included with the cost of Landscape Establishment. Watering will be completed in accordance with the manufacturer's recommendations, as included and as related to each application.
- 1.3.3 The pre-emergent herbicide will be applied in accordance with the Technical Specifications and the recommendations of the pre-emergent herbicide manufacturer, as approved by City Representatives.

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- 1.3.4 The control of weeds will be accomplished by the use of herbicides. Manual removal of weeds will be required, after herbicides have taken affect.
- 1.3.5 Contractor is responsible for the removal and disposal of all trash and debris that during the Landscape Establishment Period. Contractor will keep the project in a neat and orderly manner during the duration of the Landscape Establishment Period.

1.4 Water

The water used during Landscape Establishment to properly maintain the plant material will be furnished by City, at designated sources from within the project limits, at no charge to Contractor. Contractor will be responsible for all equipment, materials and labor necessary to load, transport and unload water for watering purposes.

1.5 Plant Material Replacements

The plant material replacement will be considered as included in the work for Landscape Establishment, and will be made at no charge to the City.

- 1.5.1 Shrub and Plant Replacement - During the second half of the Landscaping Establishment period, Contractor will provide, where required, plant replacements as follows:

<u>Original Size</u>	<u>Replacement Size</u>
1 gallon	5 gallon
5 gallon	15 gallon
15 gallon	24-inch box
36-inch box	48-inch box

- 1.5.2 Tree Replacement – During the second half of the Landscape Establishment Period, Contractor will provide plant material replacements for existing plants that die as follows:

<u>Existing Plant Material Sizes</u>	<u>Replacement Size</u>
Trees:	
2-inch Caliper	24-inch box
4-inch Caliper	36-inch box
6-inch Caliper and greater	54-inch box
Shrubs:	
All Existing Shrubs	15 gallon

1.6 Measurement and Payment

See Technical Specifications for Measurement Payment provisions.

EXHIBIT C

TECHNICAL SPECIFICATIONS



CITY OF CHANDLER

PUBLIC WORKS AND UTILITIES DEPARTMENT

RECLAIMED WATER PIPE EXTENSION

GERMANN ROAD AND HAMILTON STREET

PROJECT NO. WW2206.404

TECHNICAL SPECIFICATIONS

January 2025

MAYOR
KEVIN HARTKE

CITY COUNCIL

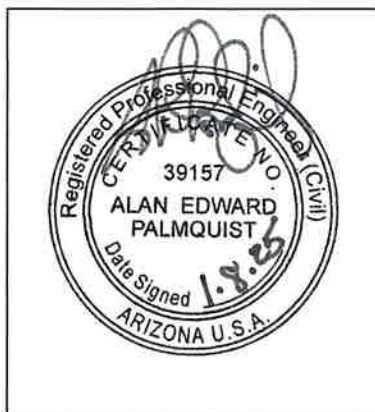
Vice Mayor Christine Ellis
Council Member OD Harris
Council Member Jennifer Hawkins

Council Member Angel Encinas
Council Member Jane Poston
Council Member Matt Orlando

CITY MANAGER
JOSHUA WRIGHT

PUBLIC WORKS & UTILITIES DIRECTOR
JOHN KNUDSON, PE

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FOR
CITY OF CHANDLER
RECLAIMED WATER PIPE EXTENSION
GERMANN ROAD AND HAMILTON STREET



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SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

- A. The work covered under this Contract will be performed within the City of Chandler in the following general locations:

1. Hamilton Street – Germann Road

1.2 DESCRIPTION OF OWNER'S PROJECT

- A. The overall scope project will consist of the following installation:
1. Installation of approximately 200 linear feet of 24-inch diameter reclaimed waterline and connecting to the existing reclaimed waterlines on Hamilton Street and Germann Road.
 2. Installation of a 4-inch and 24-inch gate valve at the intersection of Hamilton Street and Germann Road.
 3. Installation of two 12-inch insertion gate valves on the existing 12-inch diameter reclaimed waterline at the intersection of Hamilton Street and Germann Road.
 4. Installation of a 24-inch gate valve on Hamilton Street approximately 350 linear feet north of Ryan Road and Hamilton Street intersection.
 5. Complete all testing and on new reclaimed waterlines prior to connecting to existing reclaimed water distribution system. Contractor to coordinate and plan construction activities with existing operational needs of the City.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Payment for Work performed by the CONTRACTOR under these Contract Documents shall be made at the approved Contract agreement prices for each of the items listed in the Bid Schedule and further broken down as listed in the Schedule of Values. Such payment shall compensate the CONTRACTOR for all materials, labor, and equipment incorporated into the Work in accordance with the Drawings and other Contract Documents. In addition, all applicable Federal, State, County, and local taxes shall be included in such payment.
- B. The items listed in the Bid Schedule and the Schedule of Values constitutes all of the Bid Items for the completion of the Work. No direct or separate payment will be made for providing miscellaneous or temporary works, testing, safety, Shop and Record Drawings, and the removal of waste. Compensation for all such services and materials shall be included in the prices stipulated for the lump sum and unit pay items listed in the Schedule of Values.
- C. The Bid Schedule will include items 1 through 17 listed on the Bid Schedule.

1.2 MEASUREMENT

- A. Measurements of the completed Work will be made in place, with no allowance for waste.
- B. Measurements of distances will be made in a horizontal plane, unless otherwise stated.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

BID FORM DESCRIPTION

- A. The following are descriptions of the items listed on the bid form.
1. Bid Item No. 1 – “Mobilization/Demobilization” shall be paid for at the Contract lump sum price and shall include compensation for mobilizing and demobilizing the CONTRACTOR'S construction equipment and personnel, and shall include compensation for all of the temporary facilities required to complete the Project including the CONTRACTOR'S field offices, staging area, construction photographs, permits, coordination, CONTRACTOR'S quality control testing (such as soil density), utility services, clean-up, Record Drawings, progress schedules, and all other incidental and appurtenant Work not specifically specified in the other paragraphs of this Section.
 2. Bid Item No. 2 – “Survey/Staking” shall be paid for at the Contract lump sum price and shall include compensation for the cost all surveying/staking and all incidental work as shown on Contract Documents. No additional compensation will be provided in the incident that re-staking is required.
 3. Bid Item No. 3 – “Maintenance of Plant Operation (MOPO)” shall be paid for at the Contract lump sum price and shall include compensation for the cost for all MOPO work, including labor, material, and coordination required to prepare a detailed MOPO and the associated work to meet the requirements of the approved MOPO, and all necessary incidental work as shown in Specification Section 01143 and in the Contract Documents.
 4. Bid Item No. 4 – “Sidewalk Removal & Replacement” shall be paid for at the Contract price per square foot. This item shall include compensation for all work incidental towards the removal and replacement of sidewalk as shown on the Contract Documents. All work outside of the areas specified in the Contract Documents shall be authorized by the Engineer or City Inspector and shall be paid for at the unit rate cost.
 5. Bid Item No. 5 – “Curb and Gutter Removal & Replacement” shall be paid for at the Contract price per linear foot and shall include compensation for all work incidental towards the removal and replacement of any curb and gutter as shown on the Contract Documents. All work outside of the areas specified in the Contract Documents shall be authorized by the Engineer or City Inspector and shall be paid for at the unit rate cost.
 6. Bid Item No. 6 – “4” RW Removal & Replacement” shall be paid for at the Contract price per linear foot and shall include compensation for all compensation for connection with open trenching, discovery and protection of subsurface obstructions, pipe bedding, trench backfill, trench stabilization, disposal of surface and waste material at approved locations, removal and

replacement of the 4-inch Reclaimed Waterline, disinfection and all the incidental and appurtenant work to complete the item as specified and indicated on the Contract Documents.

7. Bid Item No. 7 – “24” RW System Piping & Fittings (DIP PC 250)” shall be paid for at the Contract price per linear foot. This shall include all compensation for connection with open trenching, discovery and protection of subsurface obstructions, pipe bedding, trench backfill, mill and overlay, pavement sawcut; pavement replacement to include pipe trench and pavement T-top per MAG standard specifications (asphaltic concrete pavement shall be 3” thick A19 EVAC base course and 2” of A12.5 EVAC surface course per City of Chandler standard detail C-203); trench stabilization, over excavation, disposal of surface and waste material at approved locations, furnishing and installing all below ground 24-inch water pipe and fittings, concrete encasement, and all incidental and appurtenant work to complete the item as specified and indicated on the Contract Documents.
8. Bid Item No. 8 – “12” Gate Valves” shall be paid for at the Contract price as each unit. This shall include compensation for all the work incidental towards installation of 12-inch diameter gate valves as specified on the Contract Documents.
9. Bid Item No. 9 – “4” Gate Valves” shall be paid for at the Contract price as each unit. This shall include compensation for all the work incidental towards installation of 4-inch diameter gate valves as specified on the Contract Documents.
10. Bid Item No. 10 – “24” Gate Valves Installation (Valves Supplied by the OWNER)” shall be paid for at the Contract price as each unit. This shall include compensation for all the work incidental towards installation of 24-inch diameter gate valves as specified on the Contract Documents.
11. Bid Item No. 11 - “Pavement Removal and Replacement” shall be paid for at the Contract price per square yard. This item shall include all compensation for labor, material and other miscellaneous items incidental for sawcut and removal of existing pavement, and mill and overlay and installing pavement base course and asphalt in areas greater than the nominal pipe trench and T-top per standard details. Asphaltic concrete pavement shall be 3” thick A19 EVAC base course and 2” of A12.5 EVAC surface course per City of Chandler standard detail C-203.
12. Bid Item No. 12 – “Permanent Pavement Marking” shall be paid for at the Contract price per linear foot. This shall include all compensation for all work incidental to replacement of temporary and permanent traffic lane

markings as shown on the Contract Documents. Payment shall be made based on the actual quantity of markings replaced in the field.

13. Bid Item No. 13 – “SRP Power Pole Bracing” shall be paid for at the Contract lump sum price. This shall include all cost in connection with coordinating with and compensating the Salt River Project (SRP) to complete the pole bracing process as specified within the SRP Technical Provision’s Guidance document.
14. Bid Item No. 14 – “Landscaping Restoration” shall be paid for at the Contract lump sum price. This shall include all compensation for all work incidental towards restoration of all existing landscaping disturbed as shown on the Contract Documents.
15. Bid Item No. 15 – “Traffic Control” shall be paid for at the Contract lump sum price. This shall include compensation for all work incidental by providing barricades, signage for traffic control during construction hours, and temporary plating during non-construction hours. CONTRACTOR shall be responsible for installing the temporary plating as required by the Contract Documents. Traffic Control is per City’s General Conditions, MAG Uniform Standard Details for Public Works Construction, Section 401 “TRAFFIC CONTROL”, and City of Chandler Engineering & Design Standards Manual Chapter 7 – Traffic Barricade Design.
16. Bid Item No. 16 – “Stormwater Pollution Prevention Plan” shall be paid for at the Contract lump sum price. This item shall include all cost incidental to provide SWPPP plan, installation, maintenance, and protection to prevent any storm water pollution from the project site to the adjacent areas.
17. Bid Item No. 17 – “GIS Documentation” shall be paid for at the Contract lump sum price. This shall include all cost in connection with completing all GIS documentation required by the City of Chandler and as specified within section 01050 – Field Engineering and Surveying.
18. Bid Item No. 18 – “Water Usage” The OWNER initiated allowance for water usage shall be paid at the discretion of the OWNER. The CONTRACTOR shall be responsible for obtaining a City water meter and monitor the flow used during construction activities to track and report water usage and the associated activity to the OWNER. “Water Usage” under this item shall include all cost incidental to provide dust control to prevent any dust from the project site to adjacent areas, and all construction water including use during pressure tests, earthwork, compaction efforts, and concrete mixing. Payment under this item will be based on the actual cost of the Work performed and/or the items provided.

19. Bid Item No. 19 – “Slurry Seal Allowance” The OWNER initiated allowance to slurry seal the finished pavement at the discretion of the OWNER. This allowance is not to be used by the CONTRACTOR to complete any work already identified in the Contract Documents. Payment under this item will be based on the actual cost of the Work performed and/or the items provided.
20. Bid Item No. 20 – “Off-Duty Police Officer Allowance” shall be paid for at the Contract price per hour. The purpose of this allowance is to provide a funding source for the direct costs associated with utilizing off duty police officers for traffic control purposes as required by the City. The CONTRACTOR is to utilize City of Chandler officers for off-duty flagging services. Should City of Chandler officers not be available for the time(s) requested by the CONTRACTOR, the CONTRACTOR may utilize officers from other jurisdictions with prior approval by the OWNER. In all cases, the CONTRACTOR shall be responsible for obtaining, coordinating, and paying all costs for local enforcement officers and their vehicles. Contract reimbursement from this allowance (in whole or in part) is not ensured. The CONTRACTOR will not anticipate, nor plan, for the allowance dollar amount to be included in the total Contract amount as part of this project. No additional compensation will be provided in the incident that additional off-duty officer services is required due to duplication of work in the original scope, caused by contractor error. A uniformed off-duty law enforcement officer will not be scheduled to work more than 12 consecutive hours unless an emergency exists which, in the opinion of the City Representative, requires that the officer remains in the capacity of flagger. Flagging services will be measured for each hour a uniformed off-duty enforcement officer and authorized vehicle is employed directly by the CONTRACTOR as a flagger and authorized in advance by the City Representative. Flagging services will be rounded to the nearest hour. Uniformed off-duty law enforcement officer flagging services used outside the project limits will not be reimbursed under this item. The project limits are defined as the construction work zone as shown on the approved traffic control plan for the specific area under construction. The accepted quantities of Uniformed Off-Duty Law Enforcement Officer, measured as provided above, will be paid for at the Agreement unit price per hour, which price will be full compensation for the work, complete in place, including vehicle and workman's compensation. Reimbursement for Uniformed Off-Duty Law Enforcement Officer will be paid at actual police department invoiced amount only (law enforcement officer hourly rate + hourly workers compensation fee + hourly law enforcement vehicle fee). No additional markup (overhead or profit) is allowed or paid for.
21. Bid Item No. 21 – “Owner’s Allowance” The OWNER initiated allowance for additional Work as directed by the ENGINEER/OWNER. This allowance is not be used by the CONTRACTOR to complete any work already

identified in the Contract Documents. This allowance is designated only for OWNER-requested items not included in the original scope of work. Payment under this item will be based on the actual cost of the Work performed and/or the items provided.

++ END OF SECTION ++

SECTION 01050

FIELD ENGINEERING/SURVEYING

PART 1 - GENERAL

1.1 SUMMARY

- A. The CONTRACTOR shall hire a surveyor licensed in the State of Arizona to perform all surveying responsibilities. It is also the CONTRACTOR'S responsibility to notify the ENGINEER, in writing, of any discrepancy found between the topographic survey provided and the baseline conditions provided in the Contract Documents within 14 days of the Notice to Proceed. The CONTRACTOR further takes the responsibility to correct any discrepancies not reported to the ENGINEER within the specified construction schedule as part of the finished grading required as part of this Project at no cost to the OWNER.
- B. The CONTRACTOR shall provide competent, qualified personnel and materials required to perform all construction layout staking and re-staking (as necessary) of the Work and will protect and preserve the established reference points and will make no change or relocations without the prior written approval of the OWNER.
- C. The CONTRACTOR will report to the OWNER whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations. The CONTRACTOR will replace and accurately relocate all reference points so lost, destroyed, or moved at no additional cost to the OWNER.
- D. Field surveying shall include GIS location and data of all new construction as required by the City of Chandler. The CONTRACTOR shall provide the GIS location and data at each application of payment to verify content. If data is missing or does not meet City of Chandler requirements, portions of the new construction shall be exposed to obtain the data at no additional cost to the OWNER. The City of Chandler requirements are identified below:
 - 1. Contractor shall provide survey grade GPS / GIS data, meeting the following requirements for all facilities to be owned and/or operated by the City of Chandler.
 - a. ESRI File Geodatabase format:
 - 1) All GPS point data, along with corresponding GIS Attribute data, must be submitted in ESRI File Geodatabase format.
 - 2) The City of Chandler will provide a copy of the File Geodatabase in ESRI ArcGIS format, upon submitting a data request form attached herewith. Please submit the data request form to Kristy.Noelson@Chandleraz.gov

- b. Data dictionary and Attribute data:
 - 1) Attribute data should be provided for each of the GPS'd Utility Feature listed in section 'd' below. All Attribute data should conform to the ESRI File Geodatabase format, provided by the City. A copy of the data dictionary will be made available to the CONTRACTOR.
- c. Coordinate System:
 - 1) Horizontal Datum: Arizona State Plane Coordinates, Central Zone NAD83 (HARN) Vertical Datum: NAVD88.
- d. Point Data for GPS:
 - 1) Reclaimed Water system Features:
 - a) Reclaimed water main location (top of pipe), size, and material (one (1) coordinate provided every 100 feet minimum) and at fittings.
 - b) Reclaimed water fitting location (top of feature), size, material and type including: Bend (22.5, 45, or 90), Tee, Tapping Sleeve, Cross, Coupling, End Cap, Linestop, Reducer, Saddle, Other.
 - c) Reclaimed water valve location (center of valve box cover), size and type.
 - d) Reclaimed water service line location (at connection to main, any bends, and termination at meter box or meter vault or at the edge of easement or ROW), size and material.
 - e) Reclaimed water blow-off and air release valve location (center of cover), size, type and manufacturer.
 - f) Reclaimed water manhole or vault location (center of cover), size and type.
 - 2) Standard GPS Metadata on all points collected: Date, Time, Height, Horiz_Precision, Vert_Precision, Northing, Easting, Surveyor, Datafile, and Comments
- 2. Refer to the included information, following this specification, from the City of Chandler. Contractor shall meet all requirements.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01050.1

CONSTRUCTION SURVEYING AND LAYOUT

PART 1 - GENERAL1.1 SUMMARY

- A. The CONTRACTOR will furnish all labor, materials, and equipment necessary to perform all surveying, staking, laying out of control lines, and verifications of the accuracy of all existing control points that are delineated in the Agreement Documents. The work will be done under the direction of a Registered Land Surveyor (RLS) licensed to practice in the State of Arizona.

1.2 CONSTRUCTION REQUIREMENTS:

- A. Staking Outline: Prior to beginning any survey operations, the CONTRACTOR will furnish to the Engineer, for approval, a written outline detailing the method of staking, interval of stakes, marking of stakes, grade control for various courses of materials, referencing, structure control, and any other procedures and controls necessary for survey completion. A part of this outline will also be a schedule that will show the sequencing of the survey and layout work, throughout the course of the Agreement, listing a percentage of completion for each month.
- B. Field Books: The CONTRACTOR will furnish field books to be used for recording survey data and field notes. These books will be available for inspection by the City at any time and will become the property of the City upon completion of the work.
- C. Survey Control Verification: Control Points (horizontal and vertical) The existence and location of all survey monuments, bench marks, and control points will be verified prior to demolition or construction activity. CONTRACTOR shall Immediately notify the City of Chandler Project Manager when location discrepancies greater than 0.02 foot horizontal or 0.01 foot vertical are found. All datum will be based upon the City of Chandler datum.
- D. Control Lines: Construction control lines with grade breaks, transition points, horizontal and vertical curves, etc., will be established and referenced prior to construction.
- E. Temporary Bench Marks: Temporary bench marks will be established prior to construction, maintained and periodically verified for accuracy throughout the construction phase.

- F. Pre-Construction Location Survey: All existing features will be located prior to construction, referenced to survey monuments along control lines by stationing in accordance with the construction documents and by offset distance from the control lines. All features will be re-locatable after construction. Distances measured will be within 0.01 foot.
- G. Survey monuments: The land surveyor will follow the requirements of A.R.S. § 33-103 when establishing, replacing or setting Public Land System Survey monuments at Section or Quarter Section corners and will follow the requirement in Section 9(C) of the Arizona Boundary Survey Minimum Standards when establishing new or replacement boundary monuments and witness corner monuments. Finally, land surveyors will also comply with the requirements of A.R.S. § 104 through 106 when establishing, replacing or setting any type of boundary monument. Whenever any monuments are established, including those set to replace missing or damaged monuments of a previous survey, those actions require the surveyor to create and record a survey drawing documenting the new monumentation as established.
- H. Water and Sewer Line Appurtenances: Water and sewer line surface appurtenances such as manholes, valves, and cleanouts that lie within the construction area will be located and noted on the CONTRACTOR'S approved construction documents prior to any demolition or excavation.
- I. Match Points and Removals: Verify the location (horizontal and vertical) of existing facilities to which the project connects. Immediately notify City Representatives when location discrepancies of connecting facilities greater than 0.10 foot horizontal or 0.02 foot vertical are found.
- J. Construction Stakes: The CONTRACTOR will set construction stakes and marks establishing lines and grades for road work, curbs, gutters, sidewalks, structures, buildings, centerlines for utilities and necessary appurtenances, and other work as indicated in the Contract Documents and will be responsible for their conformance with the Project Plans and Technical Specifications.

The stakes will be established in accordance with the following guidelines which represent the minimum standard and the CONTRACTOR will provide additional stakes and controls necessary to perform the work. The CONTRACTOR will be held responsible for the preservation of all stakes and marks and will replace, at no additional cost to the City, any construction stakes or marks which have been carelessly or willfully destroyed by any party.

- 1. Roadway: Subgrade stakes will be set to subgrade elevation at 50 foot intervals on straight sections, 25 foot intervals through vertical curves, on horizontal curves with radius of 600 feet or less, and/or slopes of less than 0.4%, and the beginning and end of horizontal and vertical curves and grade breaks. Stakes will be set at crown lines, at grade break lines, and at edges of

pavement which do not abut concrete curb and gutter or at the edge of pavement abutting vertical curbs or other structures whose surface grade will not be flush with the finished pavement grade. Quarter lines will be staked where the distance between the crown line stakes and the curb and gutter face exceeds 20 feet. ABC stakes will be set to ABC elevation at 33 foot intervals on straight sections, 25 foot intervals through vertical curves, on horizontal curves with radius of 600 feet or less, and/or slopes of less than 0.4%, and the beginning and end of horizontal and vertical curves, and grade breaks. Stakes will be set at crown lines, at grade breaks, and at edges of pavement which do not abut concrete curb and gutter or at the edge of pavement abutting vertical curbs or other structures whose surface grade will not be flush with the finished pavement grade. Quarter lines will be staked where the distance between the crown line stakes and the curb and gutter face exceeds 20 feet.

- a. Where the existing pavement will be milled and inlayed, the CONTRACTOR will provide 10-foot grid interval surface control horizontally and vertically.
 - b. Pavement edges will be controlled by utilizing a wire control mechanism or screeding along a concrete gutter or other structure whose surface grade is flush with the finished pavement grade. Stakes will be set to finished elevation at 33 foot intervals on straight sections, 25 foot intervals on curves with radius of 600 feet or less, and/or slopes of less than 0.4%, and the beginning and end of horizontal and vertical curves, and grade breaks.
2. Sidewalk and Bike Paths: Stakes are not required for sidewalks five feet or less in width which are adjoining existing curb and gutter.
- a. Sidewalk stakes will be set to grade on an offset and tacked for line at 25 foot intervals at the beginning and end of horizontal and vertical curves and grade breaks.
3. Storm Sewer and Drainage: All cuts will be to the invert of the pipe, given to the nearest 0.01 of a foot.
- a. Stakes for storm sewer will be driven flush with the existing ground, set on an offset at 50 foot intervals. Stakes will be marked with the offset and indicated cut.
 - b. Wyes for laterals will be marked with a line only stake.
 - c. Manholes will be marked with the offset and indicated cut to top of manhole grade and inverts.
 - d. Stakes for storm water inlets, two per inlet, will be set on a line normal to the roadway at the center line of the inlet five and ten feet from the face of curb. The stakes will be marked with the offset to the face of curb and the cut or fill to the top of curb and inverts.
 - e. Cut sheets will be supplied to the CONTRACTOR and City of Chandler Inspector.

4. Water/Reclaimed Water: All cuts will be to the invert of the pipe, given to the nearest 0.10 of a foot.
 - a. Stakes for water will be driven flush with the existing ground, set on an offset at 50 foot intervals and specified grade breaks. Stakes will be marked with the offset and indicated cut.
 - b. Fittings or other critical points such as tees will be marked with a line only stake.
 - c. Fire hydrants will be located with two stakes per hydrant set parallel with the roadway five feet from the centerline of the hydrant. The stakes will be marked with the offset to the hydrant and indicated cut to the top of curb at the centerline of the hydrant.
 - d. Water meters will be located with two stakes per meter set parallel with the roadway five feet from the centerline of the meter. The stakes will be marked with the offset to the meter and indicated cut to the top of curb at the centerline of the meter.
 - e. Cut sheets will be supplied to the CONTRACTOR and City of Chandler Inspector.
5. Traffic Signing, Striping and Detector Loops: The CONTRACTOR will delineate the procedures and controls to be utilized in the Staking Outline.
6. Inspection and Acceptance of Work: The City reserves the right to make inspections and random checks of any portion of the staking and layout work. If, in the City's opinion, the work is not being performed in a manner that will assure proper control and accuracy of the work, the City may order any or all of the staking and layout work redone at no additional cost.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01090

REFERENCE STANDARDS/ABBREVIATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section lists many of the construction industry organizations, professional and technical associations, societies and institutes, and government agencies issuing, promoting, or enforcing standards to which references may be made in the Contract Document, along with the abbreviations commonly used for those references. Also included are certain general requirements for the use of industry standards specified and for application of the standards in quality control.

1.2 USE OF REFERENCE STANDARDS

- A. Work specified by reference to the published standard or specification of a government agency, technical association, trade association, professional society or institute, testing agency, or other organization shall conform to, or surpass the minimum standards of quality for materials and workmanship established by the designated standard or specification.
- B. Where so specified, products or workmanship shall also conform to the additional prescriptive or performance requirements included within the Contract Documents to establish a higher or more stringent standard of quality than that required by the referenced standard.
- C. Where the specific date or issue of the standard is not included with the reference to the standard, the edition, including all amendments published and available on the first published date of the Invitation to Bid, shall apply.
- D. Where two or more standards are specified to establish quality, the product, and workmanship shall conform to or surpass the requirements of both.
- E. In case of conflict between referenced standards, the more stringent shall apply.
- F. Where both a standard and a brand name are specified for a product in the Contract Document, the proprietary product named shall conform to or surpass the requirements of the specified reference standard. The listing of a trade name in a Contract Document shall not be construed a warranting that such product conforms to the respective reference standard.
- G. Copies of Standards:
 - 1. Copies of applicable referenced standards have not been bound in this Contract Document.

2. Where copies of standards are needed by the CONTRACTOR for superintendence and quality control of the Work, obtain a copy or copies directly from the publication source and maintain in an orderly manner at the job site, available to the CONTRACTOR'S personnel, subcontractors, OWNER, and ENGINEER.
3. Submittals: Submit for approval the requests to use products conforming to printed standards or publications with a different publication date from that effective under the Contract. Clearly indicate the changes in product or workmanship quality involved in the proposed change, if any, and reasons for the request.

1.3 ABBREVIATIONS

- A. Abbreviations for trade organizations and government agencies. The following is a list of construction industry organizations and government agencies to which references may be made in the Contract Document, with abbreviations used.

AA	Aluminum Association
AAMA	American Architectural Manufacturers Association
AAMA	Architectural Aluminum Manufacturers' Association
AASHTO	American Association of State Highway and Transportation Officials
ABPA	Acoustical and Board Products Association
ACI	American Concrete Institute
ADA	Americans With Disabilities Act
ADEQ	Arizona Department of Environmental Quality
ADHS	Arizona Department of Health Services
AFBMA	Anti-Friction Bearing Manufacturers' Association
AGA	American Gas Association
AGC	Associated General Contractors
AGMA	American Gear Manufacturers' Association
AHC	Architectural Hardware Consultant
AI	Asphalt Institute
AIA	American Institute of Architects
AIA	American Insurance Association
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute

AITC	American Institute of Timber Construction
ALS	American Lumber Standards
AMCA	Air Moving and Conditioning Association
AMG	Arizona Masonry Guild
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
AREA	American Railway Engineering Association
ARI	Air Conditioning and Refrigeration Institute
ARMA	Asphalt Roofing Manufacturers Association
ASAE	American Society of Agricultural Engineers
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc.
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWPA	American Wood Preservers' Association
AWPB	American Wood Preservers Bureau
AWPI	American Wood Preservers' Institute
AWS	American Welding Society
AWSC	American Welding Society Code
AWI	Architectural Woodwork Institute
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers' Association
BIA	Brick Institute of America
CBMA	Certified Ballast Manufacturers' Association
CDA	Copper Development Association
CGA	Compressed Gas Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturer's Institute

CMAA	Crane Manufacturers' Association of America
CRA	California Redwood Association
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standards
CSI	Construction Specifications Institute
CTI	Cooling Tower Institute
FGMA	Flat Glass Manufacturer's Association
FIA	Factory Insurance Association
FM	Factory Mutual
FS	Federal Specification
FTI	Facing Tile Institute
GA	Gypsum Association
HI	Hydraulic Institute
HMI	Hoist Manufacturers' Institute
ICBO	International Conference of Building Officials
ICEA	Insulated Cable Engineers' Association
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IES	Illuminating Engineering Society
ISA	Instrument Society of America
JIC	Joint Industry Conferences of Hydraulic Manufacturers
LIA	Lead Industries Association
MAG	Maricopa Association of Governments
MIA	Marble Institute of America
MIA	Masonry Institute of America
MLMA	Metal Lath Manufacturers Association
MS	Military Specifications

MMA	Monorail Manufacturers' Association
NAAMM	National Association of Architectural Metal Manufacturers
NBFU	National Board of Fire Underwriters
NBHA	National Builders' Hardware Association
NBS	National Bureau of Standards
NCMA	National Concrete Masonry Association
NEC	National Electrical Code
NEMA	National Electrical Manufacturers' Association
NESC	National Electric Safety Code
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NKCA	National Kitchen Cabinet Association
NLMA	National Lumber Manufacturers' Association
NMWIA	National Mineral Wool Insulation Association
NTMA	National Terrazzo and Mosaic Association
NWMA	National Woodwork Manufacturers' Association
OECI	Overhead Electrical Crane Institute
OSHA	Occupational Safety and Health Administration (both Federal and State)
PCA	Portland Cement Association
PCI	Pre-cast Concrete Institute
PDI	Plumbing Drainage Institute
PEI	Porcelain Enamel Institute
PS	Product Standards Section - U.S. Department of Commerce
RLM	RLM Standards Institute, Inc.
RMA	Rubber Manufacturers' Association

SAE	Society of Automotive Engineers
SDI	Steel Deck Institute
SDI	Steel Door Institute
SIGMA	Sealed Insulating Glass Manufacturing Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Steel Structures Painting Council
SWI	Steel Window Institute
TEMA	Tubular Exchanger Manufacturers' Association
TCA	Tile Council of America
TIMA	Thermal Insulation Manufacturers Association
TPI	Truss Plate Institute
UBC	Uniform Building Code
UFC	Uniform Fire Code
UL	Underwriters' Laboratories, Inc.
USDA	United States Department of Agriculture
USPS	United States Postal Service
VI	Vermiculite Institute
WCLA	West Coast Lumberman's Association
WCLB	West Coast Lumber Bureau
WCLIB	West Coast Lumber Inspection Bureau
WIA	Woodwork Institute of Arizona
WPOA	Western Plumbing Officials Association
WWPA	Western Wood Products Association

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01143

COORDINATION WITH OWNER'S OPERATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The intent of this Section is to provide CONTRACTOR a sequence to perform the Work in such a manner that continuous, uninterrupted access to City municipal services and nearby businesses are maintained and operational throughout the construction period.
- B. The sequences of Work and Schedule of Completion are specified under Section 01010, Summary of Work.
- C. Except for the construction hours identified in this specification section, CONTRACTOR'S means and methods shall be implemented such that the traffic lanes shall remain in continuous satisfactory operation during the entire construction period. Work shall be so scheduled and conducted by CONTRACTOR such that it shall not impede any hindrances to the public and businesses. In performing the Work shown and specified, CONTRACTOR shall plan and schedule the Work to meet both the constraints outlined in this specification section and City of Chandler traffic control standards.
- D. Work not specifically covered in Section 01010, Summary of Work, or in the following paragraphs may, in general, shall be subject to the operating requirements outlined in this specification section.

1.2 OVERTIME

- A. All overtime work by CONTRACTOR necessary to conform to the requirements of this Section shall be performed by CONTRACTOR at no additional cost to the OWNER and shall be performed in accordance with the General Conditions. CONTRACTOR shall make no claims for extra compensation as a result thereof.
- B. PRODUCTS (NOT USED)

PART 2 - EXECUTION

2.1 COORDINATION DESCRIPTION

- A. All traffic control plans shall be in accordance with the latest City of Chandler Traffic Barricade Design Technical Manual and shall be approved by the City Traffic Inspector prior to any construction. CONTRACTOR shall submit a

construction schedule using the Critical Path Method for prior approval by the OWNER.

B. All open trenches shall be road-plated with traffic-rated plates when work is not actively occurring.

C. Reclaimed Water Piping Connections to Existing Reclaimed Water System:

1. The CONTRACTOR shall prepare Maintenance Of Plant Operation (MOPO) plans to allow all reclaimed waterlines functioning to the maximum extent possible during construction of the new reclaimed waterline throughout the project limits. The work identified within this specification section shall consist of furnishing all materials, labor, equipment, and coordination required to meet the requirements of the approved MOPO plans.

2. The CONTRACTOR shall prepare MOPO plans that provide sufficient details on the required sequencing to ensure continuous operation of the existing reclaimed water system and the services that are fed from the existing reclaimed water system along the project limits. The services include individual service lines and larger pipeline feedpoints to City owned and operated irrigation systems and operational facilities. The CONTRACTOR is hereby advised that any reclaimed water system shutdown which exceeds the timelines listed within this specification section shall not be permitted.

3. For each reclaimed water system connection identified in the Contract Documents will affect existing operational infrastructure, the CONTRACTOR shall submit MOPO plans to the OWNER and Engineer for review and prior approval a minimum of 30 days prior to commencing the work.

4. Each MOPO plan shall at a minimum include the following:

- a. Timing, method, drainage locations, and detailed work plans for each reclaimed water system connection identified in the Contract Documents.
- b. Method of keeping the existing reclaimed water system functioning prior to connecting new reclaimed waterline and/or appurtenances. The method may include temporary reclaimed waterline connections, temporary valving, and temporary thrust restraint. Details shall include, but are not limited to, material type, pipe sizing, valve sizing, size of thrust blocks, and adaptor coupling size, manufacturer, and model number.
- c. Detailed schedule for overall installation of the reclaimed waterline and related appurtenances, including the preparation of a construction sequencing plan. The schedule for the reclaimed waterline construction

work shall align with the sequencing plan or a revised sequencing plan approved by the OWNER.

- d. Timing and method of removal of temporary improvements necessary for providing continuous reclaimed water service such as temporary reclaimed waterline connections, temporary valving, and temporary thrust restraint.
- e. Work identified in the MOPO plan may be required to occur at night or during the weekend to ensure minimal disruption to City reclaimed water system operation or nearby businesses and shall occur at no additional cost to the OWNER.

5. The CONTRACTOR shall complete the reclaimed water system shutdowns, as identified below, in sequence. Each MOPO plan shall identify the sequence to which the work will be completed. The following is a sequence and description for each MOPO plan that shall be submitted for review and approval by the OWNER and Engineer.

a. MOPO Plan No. 1: New 24-inch Gate Valve Installation – Sheet C-2

- The CONTRACTOR shall complete all necessary work including excavation, trench shoring, exposing underground pipe connection, lay-down of pipe materials, pre-work of planned pipe installation on the ground surface, and traffic control prior to shutting down the City's reclaimed water system. The maximum duration for this portion of the work is 2 calendar days.
- Once OWNER and Engineer verify all pre-shutdown work is complete, CONTRACTOR shall be permitted to shut down the operation of the reclaimed water system thereby impacting Tumbleweed Recharge Facility ASR Wells 4, 5, 8, 9, 10, as well as, Tumbleweed Recharge Facility Sand Separator System, and Tumbleweed Park Irrigation Booster Pump Station No. 3 for a maximum duration of 24 continuous hours. During shut down the CONTRACTOR shall install 24-inch gate valve, pipe section, and couplings. All work shall be witnessed by the OWNER and Engineer.
- The CONTRACTOR shall complete all necessary work including bedding, backfill, valve box/cover installation, ground surface restoration, and all incidental work. The maximum duration for this portion of the work is 3 calendar days.

b. MOPO Plan No. 2: New 24-inch Gate Valve Installation – Sheet C-1

- The CONTRACTOR shall complete all necessary work including excavation, trench shoring, exposing underground pipe connection,

lay-down of pipe materials, pre-work of planned pipe installation on the ground surface, and traffic control prior to shutting down the City's reclaimed water system. The maximum duration for this portion of the work is 10 calendar days.

- Once OWNER and Engineer verify all pre-shutdown work is complete, CONTRACTOR shall be permitted to shut down the operation of the reclaimed water system thereby impacting Tumbleweed Recharge Facility ASR Wells 4, 5, 8, 9, 10, as well as, Tumbleweed Recharge Facility Sand Separator System, and Tumbleweed Park Irrigation Booster Pump Station No. 3 for a maximum duration of 24 continuous hours. During shut down the CONTRACTOR shall install 24-inch gate valve, pipe section, and couplings. All work shall be witnessed by the OWNER and Engineer.
 - The CONTRACTOR shall complete all necessary work including bedding, backfill, valve box/cover installation, ground surface restoration, and all incidental work. The maximum duration for this portion of the work is the Contract calendar days.
- c. MOPO Plan No. 3: New 24-inch Reclaimed Waterline Connection to Existing 12-inch Reclaimed Waterline within Germann Road Right-of-Way – Sheet C-1
- The CONTRACTOR shall complete all necessary work including pavement removal, sidewalk removal, curb/gutter removal, SRP pole bracing, excavation, trench shoring, exposing underground pipe connection, lay-down of pipe materials, pre-work of planned pipe installation on the ground surface, and traffic control prior to shutting down the City's reclaimed water system. The maximum duration for this portion of the work is 14 calendar days.
 - Once OWNER and Engineer verify all pre-shutdown work is complete, CONTRACTOR shall be permitted to shut down the operation of the reclaimed water system for a maximum duration of 7 calendar days. During shut down the CONTRACTOR shall install pipe section, pipe fittings, thrust blocks, 12-inch gate valves, pipe appurtenances, and couplings. All work shall be witnessed by the OWNER and Engineer.
 - The CONTRACTOR shall complete all necessary work including pavement replacement, striping, sidewalk replacement, curb/gutter replacement, bedding, backfill, valve box/cover installation, ground surface restoration, landscaping restoration, and all incidental work. The maximum duration for this portion of the work is 7 calendar days.

6. Prior to any tie-in, CONTRACTOR shall coordinate with OWNER and Engineer to schedule valve closure for isolation purposes.

7. Prior to any tie-in, CONTRACTOR shall coordinate with OWNER or ENGINEER to determine mode and location where water in existing piping will be drained. Tie-ins in Germann Rd. will require coordinated efforts with the OWNER and Engineer to isolate tie-in locations and facilitate drainage/injection of water into the existing ASR wells in Tumbleweed Park. This coordination shall be included as part of the approved MOPO plan.

a. CONTRACTOR shall be required to account for time and effort as coordinated with OWNER to lock out and tag out equipment in Tumbleweed Park Recharge Facility for coordinated drainage efforts.

8. MOPO plans shall be measured as a single complete unit of work and paid at the Agreement lump sum price, which price will be full compensation for the work, complete in place, including all required labor, material, and coordination required to prepare detailed MOPO plans and the associated work to meet the requirements of the approved MOPO plans. CONTRACTOR is responsible for and no separate measurement will be made for temporary thrust blocks, temporary valves, temporary pipe installation, development of MOPO plans, implementation of the MOPO plans, coordination, labor, and materials as required to maintain constant services to all existing reclaimed water users impacted during construction.

++ END OF SECTION ++

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 SUMMARY

- A. The CONTRACTOR shall include a completed transmittal form for all submittals. Transmittal forms will be furnished to CONTRACTOR by ENGINEER. Submittals shall be sent to the ENGINEER.

1.2 SECTION INCLUDES

- A. Shop Drawings.
- B. Material and Equipment Record.
- C. Samples.
- D. Daily reports.
- E. Testing results.
- F. Construction photographs.
- G. Record Drawings.

1.3 DATA REFERENCE SYMBOLS AND DESCRIPTIONS

- A. The submittal data required for Shop Drawings and operations manuals shall contain, but not necessarily be limited to, that data and material as defined by the coded legend set forth below. The submittal data required shall be as indicated and specified under various headings of the specifications.

LEGEND

DATA REFERENCE SYMBOLS AND DESCRIPTIONS

<u>Symbol</u>	<u>Description</u>
A	Letters of Certification of Compliance on materials, equipment, etc.
B	Samples.
C	Final certified drawings showing outline dimensions, foundation layout or mounting information, and other pertinent dimensions.
D	Field erection instructions, assembly drawings and/or diagrams, detailed reference drawing lists, and lists of erection details.
E	Shop detail drawings showing individual sub-assemblies and fabricated pieces with material specifications and other applicable data.
F	Installation instructions, operating and/or service manuals, and all other data pertinent to operating or servicing the complete apparatus. Preventative maintenance instructions and recommended frequency.
G	General bulletins and catalog cuts describing complete apparatus including operating principles and fundamentals.
H	Service data sheets showing design performance, utility requirements, etc., as applicable to the specific duty for which the equipment is furnished.
K	Curves and/or data for overall range of operation from minimum to maximum capacity or load, showing capacity or load, utilities motive

medium required, total or incremental differential head, and other pertinent information applicable to the equipment or its component assemblies.

- L Materials of construction of all components.
- M Renewal parts list with diagrammatic or cross-section drawings showing part identification. Material analysis or trades designation for each significant part is to be noted on parts lists or on a separate sheet.
- N Stuffing box sizes; packing sizes; specifications and arrangement; and mechanical seal details, specifications, etc., if furnished in equipment.
- O Bearing manufacturer's standard identification and/or interchangeable number for all anti-friction bearings in the equipment proper and its accessory items.
- P Material gradation, design mix, job mix formula, and/or material analysis.

1.4 SHOP DRAWINGS

- A. The CONTRACTOR shall submit Shop Drawings for the equipment and materials specified herein. CONTRACTOR shall submit the shop drawings online via "Newforma". The shop drawings shall be addressed to (Brandy.Nixon@wilson-engineers.com). Text shall be in electronic ASCII format. Drawings and figures shall be in AutoCAD ".dwg", or bitmap ".bmp," tiff ".tiff," jpeg ".jpg," gif ".gif," or pdf ".pdf" format.
- B. ENGINEER shall return electronic Shop Drawings to CONTRACTOR within 14 calendar days of receipt by ENGINEER.
- C. The CONTRACTOR may request submittals be reviewed up to two times for each equipment or construction material item, regardless of manufacturer or supplier, by the ENGINEER.
- D. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each

paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (✓) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The ENGINEER shall be the final authority for determining acceptability of requested deviations. The CONTRACTOR shall furnish equipment and/or services as specified if an exception and/or deviation is rejected. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

- E. The CONTRACTOR shall submit the preventive maintenance information package as part of the shop drawing submittal package to the ENGINEER for review and approval.
- F. The CONTRACTOR will be held responsible for any delay in progress of the Work due to resubmittal of Shop Drawings. Time for completion of the Contract will not be extended due to CONTRACTOR's failure to promptly submit complete and acceptable Shop Drawings, product data and samples.
- G. Do not execute Work required by Shop Drawings until accepted Shop Drawings are received from ENGINEER.
- H. Before submitting Shop Drawings for review, CONTRACTOR shall check Shop Drawings for accuracy, ascertain that all Work contiguous with and having bearing on other Work shown on Shop Drawings is accurately drawn, and that Work shown is in conformity with Contract requirements. The CONTRACTOR is responsible for all submittals from subcontractors and suppliers.
- I. All such Drawings and details, when submitted, must bear the stamp of approval of CONTRACTOR, bearing checked data, as evidence that such Drawings and details have been checked by the CONTRACTOR. Said "stamp" shall clearly state that the CONTRACTOR has checked the Drawings by providing signature certification. Any Drawings submitted without such executed stamp of approval, or whenever it is evident (despite the stamp) that the Drawings have not been checked, they will be returned to the CONTRACTOR for resubmission and will not be considered. In such event, it will be deemed that CONTRACTOR has not complied with this provision and the CONTRACTOR shall bear risk of all delays to the same extent as if no Drawings or details had been submitted.
- J. The CONTRACTOR shall prepare composite Drawings and installation layouts, when required to solve tight field conditions. Such Drawings shall consist of dimensioned plans and elevations, and must give complete information particularly

- as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc. These composite drawings and installation layouts shall be coordinated in the field by the CONTRACTOR and his subcontractors for proper relationship to the Work of other trades, based on field conditions, and shall be checked and approved by them before submission to the ENGINEER for his final review. The CONTRACTOR shall have competent technical personnel readily available for such coordinating and checking, as well as for supervision of field installation of Work as per the Drawings and installation layouts, which have been previously determined by him to be correct and carry the ENGINEER'S review stamp.
- K. Submission of Shop Drawings (in either original submission or when resubmitted with corrections) constitute evidence that the CONTRACTOR has checked all information thereon, and that he accepts and is willing to perform the Work as shown in a workmanlike manner and in accordance with best standard practice.
 - L. Cost of any changes in construction due to improper checking and coordination by the CONTRACTOR shall be paid for by the CONTRACTOR, and the CONTRACTOR shall be responsible for all additional costs, including coordination.
 - M. Shop Drawings shall clearly delineate the following information:
 - 1. ENGINEER'S name and Project number, Project name and address.
 - 2. Drawing title, number, date, and scale.
 - 3. Names of CONTRACTOR, subcontractor, and fabricator.
 - 4. Letters of Certification of Compliance
 - 5. Working and erection dimensions.
 - 6. Arrangements and sectional views.
 - 7. Necessary details, including complete information for making connections with other Work.
 - 8. Kinds of materials and finishes.
 - 9. Show descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Use same reference identification as shown on Contract Drawings.
 - N. The ENGINEER shall provide the CONTRACTOR with a form to accompany the Shop Drawings.
 - O. If Shop Drawings show variations from Contract Documents because of standard shop practice or other reasons, make specific mention of such variations in the transmittal form.
 - P. Shop Drawings review will be general. It shall not relieve the CONTRACTOR of responsibility for accuracy of such Shop Drawings, nor proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. Shop Drawings review shall not be construed as approving departures from Contract Documents.

- Q. Review of Shop Drawings and schedules shall not relieve the CONTRACTOR from responsibility for any violation indicated on such Drawings or schedules of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards or other authorities or utilities having jurisdiction.
- R. When product data, consisting of manufacturer's printed literature, is required to be submitted to ENGINEER, it shall be submitted in original form. Any fading type of reproduction will not be accepted.

1.5 CONSTRUCTION PHOTOGRAPHS

- A. Per Section 01380, Construction Photographs.

1.6 TESTING RESULTS

- A. CONTRACTOR shall furnish to ENGINEER copies of all testing results for all tests required in the Specifications.

1.7 RECORD DRAWINGS

- A. Per Section 01700, Contract Closeout. CONTRACTOR shall update Record Drawings whenever a change occurs and shall be made available for review by ENGINEER with the pay application. Failure of CONTRACTOR to maintain updated Record Drawings shall be justification for refusal of Pay Application.

1.8 ALL ADDITIONAL SUBMITTALS

- A. As required by the Contract Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01380

CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.1 SUMMARY

- A. Pre-construction Video:
 - 1. The CONTRACTOR shall furnish a pre-construction video in accordance with the Contract Documents.
- B. Ground Level Construction Photographs:
 - 1. The CONTRACTOR shall furnish progress photographs of the Project as specified herein.
 - 2. The CONTRACTOR shall provide high quality digital photographs on CDs or flash drives. The electronic file format shall be .jpg, .gif, or tiff. If the current photographs (both standard and digital) do not accompany the application, it shall not be reviewed and shall be returned to the CONTRACTOR as incomplete. At least 50 photographs (minimum of 40 digital photos specified herein) shall be taken per each Application of Payment.
 - 3. Provide interior and exterior photographs of each buried structure prior to burial. Provide a minimum of four internal views and four external views of each structure. One view shall be provided of each wall, detail, floor, and top of structure.
 - 4. In addition to the previous specified progress photographs, CONTRACTOR shall provide photographs of new and existing valves, elbows, tees, piping crossing electrical ducts with landmarks that allow location of these underground utilities. Every utility that is exposed during construction shall be photographed and documented.
- C. Aerial Construction Photographs:
 - 1. Aerial construction photographs shall not be required for this Project.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PROCEDURES

- A. The ground level construction photographs shall be of aesthetic composition and shall depict the progress of the Work from the beginning of construction through and including the finished product and shall include, but not be limited to, the items listed in Section 01010, Summary of Work.

- B. Ground level construction photographs shall be submitted monthly with the Application for Payment. The Application for Payment shall not be reviewed and shall be returned to the CONTRACTOR as incomplete if the currently due photographs have not been submitted.

++ END OF SECTION ++

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 SUMMARY

- A. Tasks listed under this Section shall be completed prior to Contract closeout and approval of the CONTRACTOR'S final pay request.

1.2 RELATED SECTIONS

- A. Section 01300, Submittals.

1.3 CONTRACT CLOSEOUT SUBMITTALS

- A. The following documents are to be submitted as specified to the ENGINEER prior to approval of the CONTRACTOR'S final pay request:
 - 1. Record Drawings shall be furnished by the CONTRACTOR. One set of blueprints annotated to show all changes shall be delivered by the CONTRACTOR to the ENGINEER. The Record Drawings shall reflect all changes made by Change Order, addenda, field order, Work directive, and any other changes made and approved during the course of the Work.
 - 2. Certification of Final Completion.
 - 3. Evidence of Payment and Release of Labor and Material Liens as outlined in the Conditions of the Contract. Affidavit of Settlement of Claims shall be furnished by the CONTRACTOR and all subcontractors.
 - 4. Release of claims as outlined in the conditions of the Contract.
 - 5. Evidence of Compliance with Requirements of Governing Authorities, including Certificate of Occupancy and Certificates of Inspection.

1.4 SITE CONDITIONS

- A. Prior to approval of the CONTRACTOR'S final pay request, and after Work has been completed, the CONTRACTOR shall dispose of all waste material and conduct final cleaning of completed work.
- B. All areas shall be restored to a condition equal to or better than the original.
- C. Site grading shall be performed to the lines and grades as shown or conforming to adjacent contours.

1.5 MAINTENANCE AND GUARANTEE

- A. The CONTRACTOR shall comply with the maintenance and guarantee requirements contained in the General Conditions.

- B. Replacement of earth fill or backfill, where it has settled below the required finish elevations, shall be considered as a part of such required repair Work, and any repair or resurfacing constructed by the CONTRACTOR which becomes necessary by reason of such settlement shall likewise be considered as a part of such required repair Work, unless the CONTRACTOR shall have obtained a statement in writing from the affected private owner or public agency releasing the CONTRACTOR from further responsibility in connection with such repair or resurfacing.
- C. The CONTRACTOR shall make all repairs and replacements promptly upon receipt of written order from the OWNER. If the CONTRACTOR fails to make such repairs or replacements promptly, the OWNER reserves the right to do the Work and the CONTRACTOR and his surety shall be liable to the OWNER for the cost thereof.

1.6 BOND

- A. The CONTRACTOR shall provide a bond to guarantee performance of the provisions contained in Paragraph 1.5, above, and the General Conditions.

1.7 RE-INSPECTION FEES

- A. Should CONTRACTOR fail to complete and correct punch list items such that additional inspections are required by ENGINEER, CONTRACTOR shall pay ENGINEER'S standard rates per person per hour for ENGINEER'S additional services. If CONTRACTOR has any questions with regard to any items on punch list, he shall request clarification before final inspection.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 02100
SITE PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Prepare the construction site for new construction.

1.2 SECTION INCLUDES

- A. Protection of certain existing trees and vegetation.
- B. Clearing and grubbing.
- C. Removing below grade improvements (including stumps).
- D. Installing and maintaining barricades and warning signs.
- E. All other miscellaneous items of Work required to complete the site preparation.

1.3 RELATED SECTIONS

- A. Section 02200, Earthwork.

1.4 PROJECT CONDITIONS

- A. Traffic: Conduct site-clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.
- B. Protection of Existing Improvements: Provide protection as necessary to prevent damage to existing improvements indicated to remain in place.
 - 1. Protect improvements on adjoining properties and OWNER'S property.
 - 2. Restore damaged improvements to their original or better condition, as acceptable to OWNER.
- C. Protection of Existing Trees and Vegetation:
 - 1. Existing vegetation in the field not scheduled for removal shall be undisturbed by the CONTRACTOR. The CONTRACTOR shall NOT remove from the site any plants unless specifically approved by the ENGINEER.
 - 2. Protect existing trees and vegetation indicated to remain against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic or parking of

vehicles within the drip line. Prior to initiating site clearing activities, the CONTRACTOR shall mark the limits of the disturbance areas either by placing lime, flags, or survey stakes at the limits shown on the Plans.

3. Do not destroy vegetation which may be naturally located in the periphery of proposed disturbed areas (within a zone $\pm$ 5 feet from the limits of construction). The ENGINEER shall be notified if existing plants are located within the fringes of the construction limits. The ENGINEER shall issue instructions at that time.
 4. Adjustments may be made in the limits of construction to protect the affected plants based on a field review of the staked limits. The adjusted construction limits shall be considered the permanent construction limits for the duration of the Project. If the ENGINEER recommends that construction limits be adjusted to preserve existing plants, the CONTRACTOR, at his own option, may elect to clear the subject vegetation and revegetate with like-kind size and species as required herein and by Landscape Drawings at no additional cost to the OWNER. The CONTRACTOR shall be entirely responsible for removal, storage, and replanting of such vegetation in accordance with City's Landscape Design of Right-of-Way, medians, and retention basin Technical Design Manual no. 8.
 5. During the course of the Work the CONTRACTOR shall:
 - a. Water trees, shrubs, and other vegetation to remain within limits of Contract Work as required to maintain their health during the course of construction operations at no additional cost to the OWNER.
 - b. Provide protection for roots over 1-1/2-inches in diameter that are cut during construction operations. Temporarily cover exposed roots with wet burlap to prevent the roots from drying out; cover with earth as soon as possible.
 - c. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations in a manner acceptable to the ENGINEER.
 - d. Trees to be protected in place shall not be pruned unless limbs are damaged, or at the direction of the ENGINEER. Employ a licensed arborist to repair damaged trees and shrubs. Replace trees that cannot be repaired and restored to full growth status, as determined by the arborist.
 - e. Trees may be pruned for routing maintenance during construction with ENGINEER'S approval at no additional cost to the OWNER.
- D. Provide a temporary construction fence/barrier to protect trees and vegetation at the limits reviewed and approved by the ENGINEER. The barrier shall be installed and remain in place for the duration of the Project or as directed by the ENGINEER.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Fencing: Any fencing removed as obstructions shall be restored to match existing with property OWNER's approval/acceptance.
- B. Barricades, warning signs, and related equipment shall be placed as required.
- C. Tree Protection Fence/Barrier: Shall be a commercially available product acceptable to the ENGINEER for its intended purpose. The barrier shall be similar to a nylon woven material or woven wire fence such as TENAX Nordic Snow Fence, or approved equal, with approved stakes approximately 36-inches in height. Submit material sample and Shop Drawings for barrier installation to the ENGINEER for approval prior to use.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Site Clearing
 - 1. General: Remove trees, shrubs, grass and other vegetation, improvements or obstructions, as required, to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. Removal includes digging out and off-site disposal of stumps and roots.
 - a. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
 - 2. Clearing and Grubbing: Within the limits of Work, clear site of trees, shrubs and other material, except for those indicated to be left standing.
 - a. Completely remove stumps, roots, and other debris protruding through the ground surface. Stump removal and backfilling of holes is required for trees indicated on the Plans to be removed.
 - b. Use only hand methods for grubbing inside drip line of trees indicated to remain.
 - c. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
 - d. Place fill material in horizontal layers not exceeding 6-inches loose depth, and thoroughly compact each layer to a density equal to adjacent original ground.
 - 3. Disposal of Waste Material:
 - a. Burning on OWNER'S Property: Burning is not permitted on OWNER'S property.
 - b. Removal from OWNER'S Property: Remove waste materials from OWNER'S property at no additional cost to the Project.

4. All miscellaneous items not specifically mentioned or designated on the Drawings as removal items, but required for the completion of the Work, shall be removed. All such items removed shall be hauled from the site.
- B. Barricades and Warning Signs:
1. Construction sites shall be properly barricaded with appropriate warning signs affixed to prevent unauthorized access to the construction site.

++ END OF SECTION ++

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. This Section covers excavating, trenching, backfilling, and grading as indicated on the Project Drawings, together with all incidental Work in connection therewith, including subgrade preparation and restoration, legally disposing of surplus and waste materials, and final site grading. Areas disturbed by construction shall be graded and excavated or filled in such a manner that completed items will conform to lines, grades, and elevations of surrounding area. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
1. Subbase course for walks and pavements.
 2. Excavating and backfilling trenches within building lines.
 3. Excavating and backfilling for underground mechanical and electrical utilities and appurtenances.
 4. Placing on-site fill material.
- B. Related Section: The following Section contains requirements that relate to this Section.
1. Section 02100, Site Preparation.

1.3 DEFINITIONS

- A. Excavation consists of the removal of material encountered to subgrade elevations and the reuse or disposal of materials removed.
- B. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- C. Borrow: Soil material obtained off site when sufficient approved soil material is not available from excavations.
- D. Subbase Course: The layer placed between the subgrade and base course in a paving system or the layer placed between the subgrade and surface of a pavement or walk.

- E. Base Course: The layer placed between the subbase and surface pavement in a paving system.
- F. Capillary Water Barrier: Course of clean sand or washed granular material placed above a water barrier sheet supporting interior concrete slab-on-grade placed to cut off upward capillary flow of pore water.
- G. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the ENGINEER. Unauthorized excavation, as well as remedial Work directed by the ENGINEER, shall be at the CONTRACTOR'S expense.
- H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.
- I. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within building lines.

1.4 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Samples of the following:
 - 1. 60 lb. representative samples of each proposed fill and backfill soil material from on-site or borrow sources.
- C. Test Reports: In addition to test reports required under field quality control, submit the following:
 - 1. Laboratory analysis of each soil material proposed for fill and backfill from on-site and borrow sources.
 - 2. One optimum moisture-maximum density curve for each soil material.
- D. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (✓) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The ENGINEER shall be the final authority for determining acceptability of requested deviations. The CONTRACTOR shall furnish equipment and/or services as specified if an exception and/or deviation is rejected. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. Failure to include a copy of the marked-up specification sections, along with justification(s)

for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

- E. The CONTRACTOR shall submit the preventive maintenance information package as part of the shop drawing submittal package to the ENGINEER for review and approval.

1.5 QUALITY ASSURANCE

- A. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction.
- B. Pre-installation Conference: Before commencing earthwork, meet with representatives of the governing authorities, OWNER, ENGINEER, consultants, Geotechnical Engineer, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least three working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.
- C. Soils Testing Service: CONTRACTOR shall employ, at his own expense, an independent testing agency, certified in the State of Arizona, to perform all testing services as specified herein. Selection of a testing agency is subject to ENGINEER'S approval. Submit a written description of proposed soils testing agency giving qualifications of personnel, equipment, and other information which may be requested by ENGINEER.

1.6 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt existing utilities serving facilities occupied by the OWNER or others except when permitted in writing by the ENGINEER and then only after acceptable temporary utility services have been provided.
 - 1. Provide a minimum 48 hours' notice to the ENGINEER and receive written notice to proceed before interrupting any utility.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide approved borrow soil materials from offsite when sufficient approved soil materials are not available from excavations.
- B. Site Soils: The granular site soils may be used as fill in all areas of the site. The clayey site soils shall not be used as subsurface wall or retaining wall backfill. The clayey sand site soils may be used in all other areas provided these soils are

- placed and compacted at moisture contents at or above optimum in exterior slab and facility areas. All materials shall be free of organics, debris, and rubble.
- C. Imported Soils: Additional fill required shall be imported soils meeting the following requirements:
 - 1. Maximum Particle Size: 3-inches.
 - 2. Maximum Swell Potential: 1.5% based on a sample which is remolded to 95% of the ASTM D698 maximum dry density at a moisture content of 2% below optimum placed under a surcharge of 100 psf and wetted.
 - 3. Maximum Percent Passing No. 200 Sieve: 40.
 - 4. Corrosion Potential: Sulfate Content (ARIZ 733) = 1,000 ppm (max), Chloride Content (ARIZ 733) = 500 ppm (max).
 - D. Backfill and Fill Materials: As shown in the Drawings and site soil as described above.
 - E. Subbase and Base Material: Maricopa Association of Governments (MAG) Specification Section 702 for Select (Subbase) Type A or B and aggregate base (Base).
 - F. Engineered Fill: Site soils as describe above subbase or base materials or aggregate base course (ABC) according to MAG Standard Specification Section 702.
 - G. Bedding Material: Subbase or base materials with 100% passing a 1-inch sieve and not more than 8% passing a No. 200 sieve.
 - 1. If on-site material can be used as bedding material, the CONTRACTOR shall take necessary steps to separate the suitable bedding material from the sandy clay and sandy silt found on site. The bedding material must meet all requirements of this Specifications Document and MAG Standard Specification Section 601.
 - 2. If on-site material does not meet the bedding material requirements, the CONTRACTOR shall supply the specified bedding material at no additional cost to the OWNER.
 - H. Capillary Water Barrier:
 - 1. Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D448, coarse aggregate Grading Size 57, with 100% passing a 1-1/2-inch sieve and not more than 5% passing a No. 8 sieve.
 - 2. Clean, washed natural or manufactured, non-plastic sand.
 - 3. Either of the above soil materials.
 - I. Filtering Material: Evenly graded mixture of natural or crushed gravel or crushed stone and natural sand, with 100% passing a 1-1/2-inch sieve and 0% to 5% passing a No. 50 sieve.
 - J. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 ACCESSORIES

- A. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6-inches wide and 4 mils thick, continuously inscribed with a description of the utility.
 - 1. Tape Colors: Provide tape colors to utilities as follows:
 - a. Red: Electric.
 - b. Yellow: Gas, oil, steam, and dangerous materials.
 - c. Orange: Telephone and other communications.
 - d. Blue: Water systems.
 - e. Green: Sewer systems.
 - f. Purple: Reclaimed Water

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- B. Provide erosion control measures following the most current City of Chandler Standards to prevent erosion or displacement of soils and discharge of soil-bearing water runoff per the National Discharge Elimination System (NPDES) or airborne dust to adjacent properties and walkways.
- C. Tree protection as specified on the Drawings.

3.2 DEWATERING

- A. Prevent surface water and subsurface or groundwater from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

3.3 EXCAVATION

- A. Explosives: Do not use explosives.
- B. Unclassified Excavation: Excavation is unclassified and includes excavation to required subgrade elevations regardless of the character of materials and obstructions encountered.

- C. Classified Excavation: Excavation is classified and includes excavation to required subgrade elevations. Excavation will be classified as earth excavation or rock excavation as follows:
 - 1. Earth excavation includes excavation of obstructions visible on surface; underground structures, utilities, and other items not indicated that we are required to be demolished and removed; together with soil and other materials encountered that are not classified as rock or unauthorized excavation.
 - a. Intermittent drilling, blasting, or ripping to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation.

3.4 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.
- B. Pavement excavation, backfilling and compaction shall be as specified in MAG Section 200.

3.5 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated slopes, lines, depths, and invert elevations.
- B. Trench excavation, backfilling and compaction shall be as specified in MAG Section 601.

3.6 APPROVAL OF SUBGRADE

- A. Notify the ENGINEER when excavations have reached required subgrade.
- B. When the ENGINEER determines that unforeseen unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
 - 1. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.
- C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the ENGINEER.

3.7 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending indicated bottom elevation of concrete foundation or footing to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to the ENGINEER.
 - 1. Fill unauthorized excavations under other construction as directed by the ENGINEER.

- B. Where indicated widths of utility trenches are exceeded, provide stronger pipe which may require higher strength pipe than specified or different pipe material depending on the limits of unauthorized excavation. Special installation procedures maybe required by the ENGINEER.

3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile excavated materials acceptable for backfill and fill soil materials, including acceptable borrow materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 BACKFILL

- A. Backfill excavations promptly, but not before completing the following:
 - 1. Acceptance of construction below finish grade including, where applicable, damp proofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing, inspecting, and approval of underground utilities.
 - 4. Concrete formwork removal.
 - 5. Removal of trash and debris from excavation.
 - 6. Removal of temporary shoring and bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Structural Backfill:
 - 1. General Structural Fill: Backfill with on-site material and compact to a uniform minimum density of 95% of the maximum density as determined by ASTM D698. Additional backfill material shall be added if required. Fill material should be free from vegetation, debris, and deleterious material, and should contain no particles larger than 6-inches in dimension. The plasticity index shall not exceed 18 as determined by ASTM D4318. Fill shall be placed in lifts no more than 8-inches and compacted to a minimum of 95% of maximum dry density as determined by ASTM D698. Moisture content during compaction shall be maintained within $\pm 2\%$ of the optimum moisture content, as determined by ASTM D698.
 - 2. CONTRACTOR may utilize $\frac{1}{2}$ sack CLSM for backfill per MAG Section 728.

3.10 UTILITY TRENCH BACKFILL

- A. Place and compact bedding course on rock and other unyielding bearing surfaces and to fill unauthorized excavations. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

- B. Concrete backfill trenches that carry below or pass under footings and that are excavated within 18-inches of footings. Place concrete to level of bottom of footings.
- C. Provide 4-inch thick concrete base slab support for piping or conduit less than 2 feet 6-inches below surface of roadways. After installation and testing, completely encase piping or conduit in a minimum of 4-inch of concrete before backfilling or placing roadway sub-base.
- D. Place and compact initial backfill of satisfactory soil material or sub-base material, free of particles larger than 1-inch, to a height of 12-inches over the utility pipe or conduit.
 - 1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.
- E. Coordinate backfilling with utilities testing.
- F. Fill voids with approved backfill materials as shoring and bracing, and sheeting is removed.
- G. Place and compact final backfill of satisfactory soil material to final subgrade.
- H. Install warning tape directly above utilities, 12-inches below finished grade, except 6-inches below subgrade under pavements and slabs.

3.11 SUBSURFACE DRAINAGE BACKFILL

- A. Subsurface Drain: Place a layer of filter fabric around perimeter of drainage trench or at footing, as indicated. Place a 6-inch compacted course of filtering material on filter fabric to support drainage pipe. After installing and testing, encase drainage pipe in a minimum of 6-inches of compacted filtering material and wrap in filter fabric, overlapping edges at least 6-inches.
- B. Drainage Backfill: Place and compact drainage backfill of filtering material over subsurface drain, in width indicated, to within 12-inches of final subgrade. Overlay drainage backfill with one layer of filter fabric, overlapping edges at least 6-inches.
- C. Impervious Fill: Place and compact impervious fill material over drainage backfill to final subgrade.

3.12 FILL

- A. The following apply to the areas within and extending 5 feet beyond the footprint of the facilities and exterior slabs.
 - 1. Clear and grub the site by removing and disposing of all vegetation, debris, rubble, and remnants of former developments.

2. Strip the area of all stockpiled fill zones, loose backfill zones, and unstable soils. During stripping observe the surface for evidence of buried debris, vegetation or disturbed materials that shall require additional removal. If encountered, these materials should be removed. Areas steeper than 5H to 1V shall be benched and any depressions widened to accommodate compaction equipment.
 3. Prepare the ground surface in fill areas and in areas cut to grade by scarifying, moisture conditioning and compacting the exposed surface soils to a depth of 8-inches.
 4. Moisture condition and place all fill and backfill materials to achieve specified grades. Fill materials shall be moisture conditioned, placed, and compacted in horizontal lifts.
- B. Place fill material in layers to required elevations for each location listed below.
1. Under grass, use satisfactory excavated or borrow soil material.
 2. Under walks and pavements, use sub-base or base material, or satisfactory excavated or borrow soil material.
 3. Under steps and ramps, use sub-base material.
 4. Under building slabs, use drainage fill material.
 5. Under footings and foundations, use engineered fill.

3.13 MOISTURE CONTROL

- A. The moisture content of soil and base materials at the time of compaction shall be:

TYPE	AREA OF USE	MOISTURE CONTENT
On-site Granular	Structure, Exterior Slab	Optimum $\pm$ 3%
On-site Clayey Soils	Structure, Exterior Slab	Optimum to Optimum +3%
On-site Soils	Pavement	2% Below Optimum or Lower
Imported Soils	Structure, Exterior Slab, Pavement	Optimum $\pm$ 3%
Base Material	Structure, Pavement	Optimum $\pm$ 3%

3.14 COMPACTION

- A. Place backfill and fill materials in layers not more than 8-inches in loose depth for material compacted by heavy compaction equipment, and not more than 4-inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure.

- C. Compact subgrade, fill, backfill, sub-base fill or base material to the following minimum percent compaction of the ASTM D698 maximum dry density in each lift:

MATERIAL	MINIMUM COMPACTION
Soil:	
Below foundations and pavement sections (fill thickness less than 5 feet).	95%
Below foundations (fill thickness greater than 5 feet).	100%
Below concrete floor slabs (above footings).	90%
Subsurface wall backfill.	95%
Base Material (Subbase and Base Courses):	
Below concrete floor slabs.	95%
Below pavement surfacing.	100%
Backfill (not adjacent to structures and beyond exterior slab areas):	90%

3.15 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
1. Provide a smooth transition between existing adjacent grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
1. Lawn or Unpaved Areas: ± 0.10 feet.
 2. Walks: ± 0.10 feet.
 3. Pavements: $\pm 1/2$ -inch.

3.16 SUBBASE AND BASE COURSES

- A. Under pavements and walks, place sub-base course material on prepared subgrades. Place base course material over sub-bases to pavements.
1. Shape sub-base and base to required crown elevations and cross-slope grades.
 2. When thickness of compacted sub-base or base course is 6-inches or less, place materials in a single layer.

3. When thickness of compacted sub-base or base course exceeds 6-inches, place materials in equal layers with no layer more than 6-inches thick or less than 3-inches thick when compacted.
- B. Pavement Shoulders: Place shoulders along edges of sub-base and base course to prevent lateral movement. Construct shoulders at least 12-inches wide of acceptable soil materials and compact simultaneously with each sub-base and base layer.

3.17 FIELD QUALITY CONTROL

- A. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed Work verify compliance with requirements.
1. Perform field in-place density tests according to ASTM D1556 (sand cone method), ASTM D2167 (rubber balloon method), or ASTM D2937 (drive cylinder method), as applicable.
 - a. Field in-place density tests may also be performed by the nuclear method according to ASTM D2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D3017.
 - b. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of Work, on each different type of material encountered, and at intervals as directed by the ENGINEER.
 2. Trench Backfill: In each compacted initial and final backfill layer, perform at least one field in-place density test for each 150 feet or less of trench, but no fewer than two tests.
- B. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, recompact, and retest until required density is obtained.
- C. Minimum number of in-place density test are as follows:

TEST LOCATION	FREQUENCY OF TEST
Utility Trench Bedding, Shading and Backfill	1 Test every 300 L.F. of Trench 12" compacted lift
Manhole Backfill	1 Test every other 12" compacted lift – Alternating sides of manhole
Structural Backfill or Retaining Wall Backfill	1 test every 200 L.F. 12" compacted lift
Finished subgrade beneath On-Site Pavements	1 test every 300 L.F. of Pavement or Fraction thereof
ABC beneath On-Site Pavements	1 test every 300 L.F. of Pavement or Fraction thereof

3.18 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace material to depth directed by the ENGINEER; reshape and recompact at optimum moisture content to the required density.
- C. Settling: Where settling occurs during the Project correction period, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the OWNER'S property.

++ END OF SECTION ++

SECTION 11295

HYDRAULIC VALVES

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish and install all valves, operators and valve accessories for reclaimed water as indicated on the Plans and as specified herein, including all appurtenances required for a complete and operational installation.

1.2 RELATED SECTIONS

- A. Section 01300, Submittals.

1.3 REFERENCES

- A. ANSI/AWWA C500 - Gate Valves.
- B. ANSI/AWWA C509 - Resilient-Seated Gate Valves.
- C. ANSI B16.1.
- D. ANSI B46.1.
- E. ASTM A126.
- F. ASTM A269.
- G. ASTM A48.
- H. ASTM A536.
- I. ASTM A582.
- J. ASTM B271.
- K. ASTM D429.
- L. ASTM D1784.
- M. ASTM D2000.
- N. ASTM F439.
- O. All other applicable ASTM and ANSI Standards.

1.4 SUBMITTALS

- A. Each Shop Drawing submittal shall include a copy of the relevant Specification Section. Each and every paragraph of the Specification Section shall be clearly marked to indicate whether the requirements for equipment and/or services in the Specification Section are met. If clarifications are needed to any of the paragraphs in the Specification Section, they shall be addressed next to the paragraph or in an attached letter as such and explained further with any additional information necessary. If any exceptions and/or deviations are proposed to any of the Specifications, they shall be clearly noted as such in the submittal, and an explanation of any deviation and/or exception shall be provided. The CONTRACTOR shall furnish equipment and/or services as specified if an exception and/or deviation is rejected.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All buried valves shall be provided with a valve box and cover.

2.2 VALVES

- A. Gate Valves, Insertion Valves, Combination Air Release Valves: 1. All Water Valves shall be in accordance with City of Chandler Supplement to MAG Standard Specification Sections 610 and 630 and as listed in the latest City of Chandler Approved Product List. 2. All buried valve box installation for potable water shall be per City of Chandler Standard Detail C-307. 3. All buried valve box installation for reclaimed water shall be per City of Chandler Standard Detail C-406.

2.3 SHOP PAINTING

- A. The manufacturer shall paint all valves, floor boxes, and valve boxes as follows:
1. Clean and remove oil, grease, dirt, loose mill scale, and other foreign substances from un-galvanized ferrous-metal surfaces.
 2. Solvent scrub with stiff bristle brush followed by brush-off abrasive blast cleaning to a minimum surface profile depth of 1.5 mils.
 3. Valves, floor boxes, and valve boxes to be installed in exterior or buried conditions shall have prime coat Series 69-1255 (beige) H.B. Epoxoline II; one coat, 3-5 mils dry film thickness (DFT).
 4. Valves and floor boxes to be installed in interior exposure conditions shall have prime coat Series 135 Chembuild; one coat, 3-5 mils DFT.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Workmanship shall be of the highest grade throughout and in accordance with the best standard practice for this type of equipment.
- B. Valves of the various types and pattern shall be installed at the respective locations as shown on the Drawings, listed in the valve schedule, and specified herein.
- C. All appurtenances required for operation and control of the valves shall be included.
- D. Joints and connections shall be made in accordance with applicable requirements for pipeline or pipe joints.
- E. Valve stems shall be plumb and vertical unless otherwise specifically shown.
- F. Each valve shall be adjusted for smooth and easy operation and shall be watertight when placed in operation under maximum working pressure.

++ END OF SECTION ++

SECTION 15050

PIPING SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope: This Section specifies systems of process piping and general requirements for piping systems. Detailed Specifications for the components listed on the Piping System Specification Sheets are found in other Sections of Division 15, Mechanical. This Section shall be used in conjunction with those Sections.
- B. Related Sections:
 - 1. Section 02200, Earthwork.
 - 2. Section 15051, Buried Piping Installation.

1.2 QUALITY ASSURANCE

- A. This Section contains references to the following documents. They are a part of this Section as specified and modified. In case of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail.
- B. Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids). If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, whether or not the document has been superseded by a version with a later date, discontinued, or replaced.
 - 1. AASHTO M36/M36M - Metallic (Zinc or Aluminum) Coated Corrugated Steel Culverts and Underdrains.
 - 2. ANSI A13.1 - Scheme for the Identification of Piping Systems.
 - 3. ANSI B1.20.1 - Pipe Threads, General Purpose (Inch).
 - 4. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings Class 25, 125, 250, and 800.
 - 5. ANSI B16.3 - Malleable Iron Threaded Fittings Class 150 and 300.
 - 6. ANSI B16.5 - Pipe Flanges and Flanged Fittings.
 - 7. ANSI B16. - Factory Made Wrought Steel Buttwelding Fittings.
 - 8. ANSI B16.11 - Forged Steel Fittings, Socket Welding and Threaded.
 - 9. ANSI B16.12 - Cast Iron Threaded Drainage Fittings.
 - 10. ANSI B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

11. ANSI B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes.
12. ANSI B31.1 - Power Piping.
13. ANSI B31.3 - Chemical Plant and Petroleum Refinery Piping.
14. ASME Section IX - Boiler and Pressure Vessel Code; Welding and Brazing Qualifications.
15. ASTM A47 - Malleable Iron Castings.
16. ASTM A74 - Cast Iron Soil Pipe and Fittings.
17. ASTM A105/A105M - Forgings, Carbon Steel, for Piping Components.
18. ASTM A106 - Seamless Carbon Steel Pipe for High Temperature Service.
19. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
20. ASTM A197 - Cupola Malleable Iron.
21. ASTM A234/A234M - Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
22. ASTM A312/A312M - Seamless and Welded Austenitic Stainless Steel Pipe.
23. ASTM A403/A403M - Wrought Austenitic Stainless Steel Piping Fittings.
24. ASTM A536 - Ductile Iron Castings.
25. ASTM A570/A570M - Hot Rolled Carbon Steel Sheet and Strip, Structural Quality.
26. ASTM B88 - Seamless Copper Water Tube.
27. ASTM C76 - Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
28. ASTM C443-REV A - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
29. ASTM C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
30. ASTM D1248 - Polyethylene Plastics Molding and Extrusion Materials.
31. ASTM D1784 - Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
32. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
33. ASTM D2241 - Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).
34. ASTM D2513 - Thermoplastic Gas Pressure Pipe, Tubing, and Fittings.
35. ASTM D2665 - Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.
36. ASTM D2996 - Filament Wound Reinforced Thermosetting Resin Pipe.
37. ASTM D3034 - Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
38. ASTM D3261 - Butt Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
39. ASTM D4174 - Cleaning, Flushing, and Purification of Petroleum Fluid Hydraulic Systems.
40. ASTM D4101 - Propylene Plastic Injection and Extrusion Materials.
41. ASTM F441 - Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.
42. AWWA C105 - Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids.

43. AWWA C110 - Ductile Iron and Gray Iron Fittings, 3" Through 48", for Water and Other Liquids.
 44. AWWA C111 - Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings.
 45. AWWA C115 - Flanged Ductile Iron and Gray Iron Pipe with Threaded Flanges.
 46. AWWA C151 - Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
 47. AWWA C200 - Steel Water Pipe 6" and Larger.
 48. AWWA C205 - Cement Mortar Protective Lining and Coating for Steel Water Pipe - 4" and Larger - Shop Applied.
 49. AWWA C206 - Field Welding of Steel Water Pipe.
 50. AWWA C207 - Steel Pipe Flanges for Waterworks Services - Sizes 4" Through 144".
 51. AWWA C208 - Dimensions for Fabricated Steel Water Pipe Fittings.
 52. AWWA C209 - Cold Applied Tape Coating for Special Sections, Connections, and Fittings for Steel Water Pipelines.
 53. AWWA C210 - Liquid Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipe.
 54. AWWA C214 - Tape Coating Systems for the Exterior of Steel Water Pipelines.
 55. AWWA 301 - Pre-stressed Concrete Pressure Pipe, Steel Cylinder Type, for Water and Other Liquids.
 56. AWWA C303 - Reinforced Concrete Pressure Pipe, Steel Cylinder Type, Pre-tensioned, for Water and Other Liquids.
 57. AWWA C600 - Installation of Ductile Iron Water Mains and Their Appurtenances.
 58. AWWA C651 - Disinfecting Water Mains.
 59. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, 4" Through 12", for Water.
 60. AWWA M11 - Steel Pipe - A Guide for Design and Installation.
 61. CISPI 301 - Specification Data for Hubless Cast Iron Sanitary System with No-Hub Pipe and Fittings.
 62. FEDSPEC L-C-530B(1) - Coating, Pipe, Thermoplastic Resin, or Thermosetting Epoxy.
 63. MIL-H-13528B - Hydrochloric Acid, Inhibited, Rust Removing.
 64. MIL-STD-810C - Environmental Test Methods.
 65. SAE J1227 - Assessing Cleanliness of Hydraulic Fluid Power Components and Systems.
 66. UPC - Uniform Plumbing Code.
- C. Fittings and Coupling Compatibility:
1. To assure uniformity and compatibility of piping components, fittings and couplings for grooved end piping systems shall be furnished by the same manufacturers.

- D. All Pipes, fittings, valves, fire hydrants, and other appurtenances shall conform to current AAWA, ASTM, and NSF standards.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Unless otherwise specified, piping materials including pipe, gaskets, fittings, connection and joint assemblies, linings, and coatings shall be selected from those listed on the Piping System Specification Sheets.
- B. Piping materials shall conform to detailed specifications for each type of pipe and piping appurtenance specified in other Sections of Division 15, Mechanical.
- C. All piping shall be compatible with the fluid to which it is exposed.
- D. All piping and valves to be used for the air release valve connections shall be copper or brass material.
- E. All piping which comes in contact with potable water shall have NSF 61 certification.

2.2 VALVES

- A. Valves of the same size and service shall be provided by a single valve manufacturer. Packing shall be non-asbestos material. Actual length of valves shall be within 1/16-inch ($\pm$) of the manufacturer's specified length. Flanges shall meet the requirement of ANSI B16.5. Push-on and mechanical joints shall meet the requirements of AWWA C111.
- B. All Valves shall be manufactured as listed in the latest City of Chandler Approved Product List. No other manufacturer shall be acceptable.

2.3 SUBMITTALS

- A. All additional submittal information shall be included with this submittal information as noted in the Division 15, Mechanical, Pipe Material Specifications.
- B. Each Shop Drawing submittal shall include a copy of the relevant Specification Section. Each and every paragraph of the Specification Section shall be clearly marked to indicate whether the requirements for equipment and/or services in the Specification Section are met. If clarifications are needed to any of the paragraphs in the Specification Section, they shall be addressed next to the paragraph or in an attached letter as such and explained further with any additional information May 2022 City of Chandler 21-047 15050-5 Chandler Heights Road Utility Relocations necessary. If any exceptions and/or deviations are proposed to any of the Specifications, they shall be clearly noted as such in the submittal, and an

explanation of any deviation and/or exception shall be provided. The CONTRACTOR shall furnish equipment and/or services as specified if an exception and/or deviation is rejected.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Location:

1. Piping shall be provided as specified, except for adjustments, to avoid architectural and structural features.

B. Piping Sizes:

1. Where the size of piping is not specified, the CONTRACTOR shall provide piping of the sizes required by UPC. Unless specified otherwise, small piping (less than 1-inch in diameter) required for services not described by UPC shall be 1/2-inch.

3.2 TESTING

A. General:

1. Upon completion of piping, but prior to application of insulation on exposed piping, the CONTRACTOR shall test the piping systems in accordance with the appropriate MAG and City of Chandler Specifications. Pressures, media, and test durations shall be as specified in the PIPESPEC. Equipment which may be damaged by the specified test conditions shall be isolated. Testing shall be performed using calibrated test gages and calibrated volumetric measuring equipment to determine leakage rates. Each test gage shall be selected so that the specified test pressure falls within the upper half of the gage's range. Unless otherwise specified, the CONTRACTOR shall notify the ENGINEER 24 hours prior to each test.
2. Unless otherwise specified, testing, as specified herein, shall include existing piping systems that connect with new pipe systems. Existing pipe shall be tested to the nearest existing valve. Any piping that fails the test shall be repaired. Repair of existing piping will be considered and paid for as extra Work.
3. All blow off assemblies shall be removed after successful testing of the new pipes as specified in the Drawings.

B. Liquid Systems:

1. Pressure and leakage testing for water systems shall be in accordance with MAG Section 610. Unless otherwise specified, leakage from other buried liquid piping systems shall be less than 0.02 gallons per hour per inch diameter per 100 feet of buried piping.

3.3 CLEANING AND FLUSHING

A. General:

1. Piping systems shall be cleaned following completion of testing and prior to connection to operating, control, regulating, or instrumentation equipment.
2. The CONTRACTOR may, at his option, clean and test sections of buried piping systems. Use of this procedure, however, will not waive the requirement for a full pressure test of the completed system.
3. Unless specified otherwise, piping 24-inches in diameter and smaller shall first be cleaned by pulling a tightly fitting cleaning ball or swab through the system.
4. Piping larger than 24-inches in diameter may be cleaned manually or with a cleaning ball or swab.

B. Liquid Systems:

1. After completion of cleaning, liquid systems, unless otherwise specified, shall be flushed with clean water.

C. Water Systems:

1. For non-potable water systems, final flushing and microbiological testing, as specified in MAG Section 611.15, is not required.

3.4 PIPING SPECIFICATION SHEETS (PIPESPEC)

- A. Piping and valves for groupings of similar plant processes or types of service lines are specified on individual piping specification sheets (PIPESPECS). Piping services are grouped according to the chemical and physical properties of the fluid conveyed and/or by the temperature or pressure requirements. Piping services specified in the PIPESPECS and on the Drawings are alphabetically arranged by designated service symbols, as shown in Table A. Table A also indicates the system number, fluid category and pipe marker background color each service.

TABLE A - PIPING SERVICES			
Symbol	Service	Fluid Category	Pipe Marker Background Color
RW	Reclaimed Water	Liquid	Purple

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PIPING SYMBOL/SERVICE

**RW – RECLAIMED
WATER**

Medium:

Reclaimed Water.

Pressure:

At least 125% of class rating of pipe under test. All requirements of MAG and City of Chandler Specifications shall be met.

Duration:

2 hours.

Gasket Requirements:

Flange:

1/8-inch thick Red Rubber Gasket Material (SBR) conforming to ASTM D1330.

Push-on/Mech. Cpl:

Nitrile or Neoprene.

Buried and Encased Pipes:

(See Drawings for pipe sizes and materials.)

(4” and Larger)
Pipe:

Ductile Iron; AWWA C151
with cement mortar lining. Ref.
Spec. Section 15061
Ductile Iron Conn; Restrained
push-on rubber gasket
joint. Flanged adapters
for valves and ends.
Ductile Iron Ftgs; Ductile iron
per Spec. Section
15061.
Ductile Iron Exterior Coating;
Bituminous Coated,
Polyethylene Wrap

(2-1/2" and Larger)
Valves:

Gate; Refer Section 11295,
with extension stem and valve
box.

BURIED PIPING SCHEDULE

Service	Material	Interior Lining	Exterior Coating	Pressure Class	Joint	Test Pressure (psig)
Reclaimed Water (Larger than 12-inch diameter)	DIP	CM	BC/PE	250	MJ	PER 15051

++ END OF SECTION ++

SECTION 15051

BURIED PIPING INSTALLATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to install and test all buried piping, fittings, and specials. The Work includes, but is not limited to, the following:
 - a. All types and sizes of buried piping, except those specified under other Sections.
 - b. Supports, restraints, and thrust blocks.
 - c. Pipe encasements.
 - d. Work on or affecting existing piping.
 - e. Testing.
 - f. Cleaning.
 - g. Installation of all jointing and gasketing materials, specials, flexible couplings, mechanical couplings, harnessed and flanged adapters, sleeves, tie rods, and all other Work required to completing the buried piping installation.
 - h. Incorporation of valves, meters and special items shown or specified into the piping systems as required and as specified in the appropriate Division 15, Mechanical Sections.
 - i. Unless otherwise specifically shown, specified, or included under other Sections, all buried piping work required begins at the outside face of structures or structure foundations and extending away from structure.

B. Coordination:

1. Review installation procedures under other Sections and coordinate with the Work that is related to this Section.
2. Section 15051, Buried Pipe Installation, specifies the installation of all buried piping materials specified in Sections of Division 15, Mechanical. Coordinate with these Sections.

C. Related Work Specified Elsewhere:

1. Section 02200, Earthwork.
2. Section 11295, Hydraulic Valves.
3. Section 15050, Piping Systems.
4. Section 15061, Ductile Iron Pipe.
5. Section 15020, Piping Specialties and Accessories.

1.2 QUALITY ASSURANCE

- A. CONTRACTOR shall conform to all applicable requirements of Parts 600 and 700 of the Uniform Standard Specifications for Public Work Construction by the Maricopa Association of Governments (MAG). If there is a conflict between MAG Standard Specifications and these Specifications, the provisions of these Specifications shall govern.
- B. Requirements of Regulatory Agencies:
 - 1. Comply with requirements of UL, FM, and other jurisdictional authorities, where applicable.
 - 2. Refer to the General and Supplementary Conditions regarding permit requirements for this Work.
- C. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
 - 1. ASTM D2321 - Practice for Underground Installation of Flexible Thermoplastic Pipe.
 - 2. ASTM D2774 - Practice for Underground Installation of Thermoplastic Pressure Piping.
 - 3. AWWA C105 - Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids.
 - 4. AWWA C111 - Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings.
 - 5. AWWA C200 - Steel Water Pipe.
 - 6. AWWA C205 - Cement Mortar Protective Lining and Coating for Steel Water Pipe.
 - 7. AWWA C206 - Field Welding of Steel Water Pipe.
 - 8. AWWA C207 - Steel Pipe Flanges for Waterworks Service.
 - 9. AWWA C208 - Dimensions for Fabricated Steel Water Pipe Fittings.
 - 10. AWWA C600 - Installation of Ductile Iron Water Mains and Their Appurtenances.
 - 11. AWWA C606 - Grooved and Shouldered Joints.
 - 12. AWWA C651 - Disinfecting Water Mains.
 - 13. AWWA M11 - Steel Pipe - A Guide for Design and Installation.
 - 14. AWWA M23 - PVC - Design and Installation.
 - 15. AWWA M41 - Ductile Iron Pipe and Fittings.
 - 16. ASCE MOP No. 37 - Design and Construction of Sanitary and Storm Sewers
 - 17. Concrete Pipe Handbook - American Concrete Pipe Association.

1.3 SUBMITTALS

- A. Shall be in accordance with Section 15050, Piping Systems, submittal information.
- B. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate

requested deviations from specification requirements. Check marks (✓) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The ENGINEER shall be the final authority for determining acceptability of requested deviations. The CONTRACTOR shall furnish equipment and/or services as specified if an exception and/or deviation is rejected. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the site to ensure uninterrupted progress of the Work.
- B. Handle all pipe, fittings, specials, and accessories carefully with approved handling devices. Do not drop or roll material off trucks. Do not otherwise drop, roll, or skid piping.
- C. Store pipes and fittings on heavy wood blocking or platforms so they are not in contact with the ground.
- D. Unload pipe, fittings, and specials opposite to or as close to the place where they are to be installed as is practical to avoid unnecessary handling. Keep pipe interiors completely free from dirt and foreign matter.
- E. Inspect delivered pipe for cracked, gouged, chipped, dented, or other damaged material and immediately remove defective pipe from site.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Required pipe materials are listed in the Piping Schedule. Refer to applicable Sections for Material Specifications.
- B. General:
 - 1. Marking Piping:
 - a. Clearly mark each piece of pipe or fitting with a designation conforming to those shown on the laying schedule and/or Shop Drawings.
 - b. Cast or paint material, type, and pressure designation on each piece of pipe or fitting 4-inches in diameter and larger. Each piece of steel pipe shall be clearly marked with the thickness of the steel in the pipe wall.

- c. Pipe and fittings smaller than 4-inches in diameter shall be clearly marked by manufacturer as to material, type, and rating.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Installation of all pipe, fittings, valves, specials, and appurtenances shall be subject to the review and/or approval of the ENGINEER.
2. Install piping as shown, specified, and as recommended by the manufacturer and in conformance with referenced standards, and approved Shop Drawings.
3. Request instructions from ENGINEER before proceeding if there is a conflict between the manufacturer's recommendations and the Contract Documents.
4. All piping shall be inspected by the ENGINEER prior to installation. ENGINEER'S inspection will not relieve CONTRACTOR or manufacturer from responsibility for damaged products.
5. All piping shall be carefully examined for cracks, damage, or other defects before installation. Any piping that is defective, including but not limited to, cracked, damaged, in poor condition, or with damaged linings or improper markings shall be rejected unless the product can be repaired in a manner acceptable to the manufacturer and ENGINEER. Any piping found to be broken or defective after it has been installed shall be removed, replaced, or repaired at the CONTRACTOR'S expense.
6. Minimum earth cover over the piping shall be as shown on the Drawings, specified or directed by the ENGINEER, but in no case shall the earth cover be less than 4 feet for all piping.
7. Required earthwork shall be as specified in applicable Sections of Division 2, Site Work.
8. Present all conflicts between piping systems and equipment, structures or facilities to ENGINEER for determination of corrective measures before proceeding.
9. Take field measurements, where required, prior to installation to ensure proper fitting of Work. The CONTRACTOR shall uncover the existing pipelines sufficiently in advance of the proposed Work in order that the type and location of the existing pipes and joints and other information required to fabricate the proposed piping can be determined. It shall be the responsibility of the CONTRACTOR to obtain whatever information is required to complete the connections of the proposed pipelines to the existing pipelines. Refer to Paragraph 3.3 of this Section, as applicable.
10. Interior of all piping and mating surfaces shall be inspected and all dirt, gravel, sand, debris or other foreign material shall be completely removed from the interior and mating surfaces before installation. Measures shall be taken to maintain the interior of all piping clean until acceptance of the completed Work. Care shall be taken to prevent foreign matter from entering joint space. Bell and spigot mating surfaces shall be wiped clean immediately before

piping is laid. For ductile iron pipe, the bell and spigot mating surfaces shall be thoroughly cleaned with a wire brush.

11. Install piping accurately to line and grade shown, specified or directed, unless otherwise approved by the ENGINEER. Accurate means of determining and checking the alignment and grade shall be used, which shall be subject to the approval of the ENGINEER. Any modifications to the Contract Documents to suit the pipe manufacturer's standard shall be approved by the ENGINEER. Remove and relay piping that is incorrectly installed, at CONTRACTOR'S expense.
12. Do not lay piping in water, unless otherwise specified in these Specifications or approved by the ENGINEER. Ensure that the water level in the trench is at least 6-inches below the bottom of piping. Maintain a dry trench until jointing and backfilling are complete, unless otherwise specified in these Specifications or approved by the ENGINEER.
13. Where unforeseen conditions will not permit the installation of piping as shown or specified, no piping shall be installed without approval of the ENGINEER. Do not modify structures or facilities without approval of the ENGINEER.
14. Start laying piping at lowest point and proceed toward the higher elevations, unless otherwise approved by the ENGINEER. Slope piping uniformly between elevations shown on the Drawings or as otherwise directed by the ENGINEER.
15. Place bell and spigot piping so that the bells face the direction of laying, unless otherwise approved by the ENGINEER.
16. Piping shall be installed so that the barrel of the piping, and not the joints, receives the bearing pressure from the trench bottom or other bedding condition.
17. No piping shall be brought into position until the preceding length, valve, fitting, or special has been bedded and secured in place.
18. Whenever pipe laying is not actively in progress, the open ends of the piping shall be closed by a temporary plug or cap to prevent soil, water, and other foreign matter from entering the piping.
19. Field cutting of metallic piping, where required for inserting valves, fitting, specials, and closures, shall be made with a machine specially designed for cutting piping and in accordance with the manufacturer's instructions. Cuts shall be carefully done, without damage to piping, so as to leave a smooth end at right angles to the axis of the piping. Cut end shall be tapered and sharp edges filed off smooth. Flame cutting shall not be permitted. Piping damaged by the CONTRACTOR by improper or careless methods of cutting shall be replaced or repaired at his expense.
20. Blocking under piping shall not be permitted, unless specifically approved by ENGINEER for special conditions.
21. Protective linings and coatings shall be touched up prior to installation, where required.
22. Except where bends, wyes or similar fittings are used, changes in alignment and grade of the piping shall be made by deflecting joints or with beveled pipe.

Permissible joint deflection shall not exceed 75% of the amount allowed by the manufacturer.

23. All joints shall be made in the presence of the ENGINEER, or his duly authorized representative, except as otherwise approved.
 24. Special care shall be taken to ensure that each section of piping abuts against the next in such a manner that there will be not shoulder or unevenness of any kind along the piping invert.
 25. Piping shall be rotated as required to place outlets in proper position.
 26. Blind flanges and cleanouts shall be provided at locations shown on the Drawings, specified, or required. Cleanouts on buried piping shall include all pipes, fittings, and appurtenances required to bring cleanout to finished grade and terminate in a flange and blind flange or suitably capped piping as shown. Cleanout piping shall be same as that specified for the main run.
 27. All gravity lines shall pitch uniformly at the grade shown or as specified or approved.
 28. Short pipe stubs, maximum 4 feet in length, shall be used at all manholes and other wall faces, except as otherwise specified.
 29. Field painting shall be accomplished after joints are made.
 30. All piping shall be plugged watertight with a suitable cap or plug securely fastened to the end of the piping at all contact interfaces.
 31. CONTRACTOR shall notify ENGINEER in advance of backfilling operations.
 32. On steep slopes, take measures acceptable to ENGINEER to prevent movement of the pipe during installation.
 33. Thrust Restraint: During the installation of the pipe, thrust blocks, tied joints, or proprietary restrained joint systems shall be provided wherever required for thrust restraint. Thrust restraint shall conform to the applicable requirements of Paragraph 3.2 of this Section.
 34. Exercise care to avoid flotation when installing pipe in cast-in-place concrete.
- B. Manufacturer's Installation Specialist:
1. Provide the services of a competent installation specialist of the pipe manufacturer when pipe laying begins if the CONTRACTOR is not experienced in laying and jointing a particular type of pipe.
 2. Retain installation specialist at the site for a minimum of two days or until competency of the pipe laying crew has been satisfactorily demonstrated.
- C. Separation of Sewers and Potable Water Pipe Lines:
1. Conform to the requirements of all applicable requirements of the Uniform Standard Specifications for Public Work Construction by the Maricopa Association of Governments (MAG).
- D. Plugs:
1. Temporarily plug installed pipe at the end of each day's Work or other interruption to the installation of any pipe line. Plugging shall prevent the entry of animals, liquids, or persons into the pipe or the entrance or insertion of deleterious materials.

2. Install standard plugs into all bells at dead ends, tees or crosses. Cap all spigot ends.
 3. Fully secure and block all plugs and caps installed for pressure testing to withstand the specified test pressure.
 4. Where plugging is required for phasing of the Work or for subsequent connection of piping, install watertight, permanent type plugs.
- E. Bedding Pipe: Bed pipe as specified below and in accordance with the details shown.
1. Trench excavation and backfill and bedding materials shall conform to the requirements of Section 02200, Earthwork, as applicable.
 2. Excavate trenches below the pipe bottom by an amount specified. Remove all loose and unsuitable material from the trench bottom.
 3. Carefully and thoroughly compact all pipe bedding with hand held pneumatic compactors.
 4. Do not lay pipe until the ENGINEER approves the bedding condition. If a conflict exists, obtain clarification from ENGINEER before proceeding.
 5. No pipe shall be brought into position until the preceding length has been bedded and secured in its final position.
- F. Laying Pipe:
1. Conform to manufacturer's instructions and requirements of the standards listed below, where applicable:
 - a. Ductile Iron Pipe: AWWA C600, AWWA C105.
 - b. ASCE Manual of Practice No. 37.
- G. Polyethylene Encasement:
1. Provide polyethylene encasement for ductile iron piping to prevent contact between the pipe and surrounding bedding material and backfill.
 2. Polyethylene may be supplied in tubes or in sheet material.
 3. Polyethylene encasement materials and installation shall be in accordance with the requirements of MAG Section 610.6.
- H. Jointing Pipe:
1. Ductile Iron Mechanical Joint Pipe:
 - a. Wipe clean the socket, plain end and adjacent areas immediately before making joint. Make certain that cut ends are tapered and sharp edges are filed off smooth.
 - b. Lubricate the plain ends and gasket with soapy water or an approved pipe lubricant, in accordance with AWWA C111, just prior to slipping the gasket onto the plain end of the joint assembly.
 - c. Place the gland on the plain end with the lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end.
 - d. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during assembly.

- e. Push gland toward socket and center it around pipe with the gland lip against the gasket.
- f. Insert bolts and hand tighten nuts.
- g. Make deflection after joint assembly, if required, but prior to tightening bolts. Alternately tighten bolts 180 degrees apart to seat the gasket evenly. The bolt torque shall be as follows:

Pipe Size (inches)	Bolt Size (inches)	Range of Torque (ft-lbs)
3	5/8	45-60
4-24	3/4	75-90
30-36	1	100-120
42-48	1-1/4	120-150

- h. All bolts and nuts shall be heavily coated with two 10 mil minimum coats of coal-tar epoxy coating as manufactured by Koppers, Tnemec, or equal.
 - i. Restrained mechanical joints shall be in accordance with Section 15061, Ductile Iron Pipe.
2. Ductile Iron Push-On Joint Pipe:
- a. Prior to assembling the joints, the last 8-inches of the exterior surface of the spigot and the interior surface of the bell shall be thoroughly cleaned with a wire brush, except where joints are lined or coated with a special protective lining or coating.
 - b. Rubber gaskets shall be wiped clean and flexed until resilient. Refer to manufacturer's instructions for procedures to ensure gasket resiliency when assembling joints in cold weather.
 - c. Insert gasket into joint recess and smooth out the entire circumference of the gasket to remove bulges and to prevent interference with the proper entry of the spigot of the entering pipe.
 - d. Immediately prior to joint assembly, apply a thin film of approved lubricant to the surface of the gasket which will come in contact with the entering spigot end of pipe. CONTRACTOR may, at his option, apply a thin film of lubricant to the outside of the spigot of the entering pipe.
 - e. For assembly, center spigot in the pipe bell and push pipe forward until it just makes contact with the rubber gasket. After gasket is compressed and before pipe is pushed or pulled all the way home, carefully check the gasket for proper position around the full circumference of the joint. Final assembly shall be made by forcing the spigot end of the entering pipe past the rubber gasket until it makes contact with the base of the bell. When more than a reasonable amount of force is required to assemble the joint,

the spigot end of the pipe shall be removed to verify the proper positioning of the rubber gasket. Gaskets which have been scoured, or otherwise damaged, shall not be used.

- f. Maintain an adequate supply of gaskets and joint lubricant at the site at all times when pipe jointing operations are in progress.

3. Proprietary Joints:

- a. Pipe which utilizes proprietary joints such as Fastite, by American Cast Iron Pipe Company, Tyton by U.S. Pipe Incorporated, restrained joints described under Paragraph 3.2 of this Section, or other such joints shall be installed in strict accordance with the manufacturer's instructions.

4. Mechanical Coupling Joints:

- a. Prior to the installation and assembly of mechanical couplings, the joint ends shall be cleaned thoroughly with a wire brush to remove foreign matter. Following this cleaning, lubricant shall be applied to the rubber gasket or inside of the coupling housing and to the joint ends. After lubrication, the gasket shall be installed around the joint end of the previously installed piece and the joint end of the subsequent piece shall be mated to the installed piece. The gasket shall be positioned and the coupling housing placed around the gasket and over the grooved or shouldered joint ends. The bolts shall be inserted and the nuts screwed up tightly by hand. The bolts shall then be tightened uniformly in order to produce an equal pressure on all parts of the housing. When the housing clamps meet metal to metal, the joint is complete and further tightening is not required.

I. Backfilling:

1. Conform to the applicable requirements of Section 02200, Earthwork.
2. Place backfill as construction progresses. Backfill by hand and use power tampers until pipe is covered by at least 1 foot of fill.

J. Connections to Valves:

1. Install valves as shown.
2. Provide suitable adapters when valves and piping have different joint types.
3. Provide thrust restraint at all valves at pipeline terminations.

K. Transitions from One Type of Pipe to Another:

1. Provide all necessary adapters, specials and connection pieces required when connecting different types and sizes of pipe or connecting pipe made by different manufacturers.

L. Closures:

1. Provide all closure pieces shown or required to complete the Work.

3.2 THRUST RESTRAINT

- A. Provide thrust restraint on all pressure piping systems and where otherwise shown and specified. Pipe joints shall be restrained as specified in Paragraph 3.2.C of this Section.
- B. Thrust restraint shall be accomplished by means of restrained pipe joints. Concrete thrust blocks shall be used only when specifically shown on the Drawings or as directed by the ENGINEER. Thrust restraints shall be designed for the axial thrust exerted by the test pressure given in the Buried Piping Schedule.
- C. Restrained Pipe Joints:
 - 1. Pipe joints shall be restrained by means suitable to the type of pipe being installed.
 - a. Ductile iron push-on joints and mechanical joints shall be restrained utilizing a proprietary restrained joint system such as American Fast-Grip and American Flex-Ring Joint, MEGALUG Ductile Iron Pipe Restraints as manufactured by EBAA Iron Inc., TR Flex Gripper Ring and TR Flex Joints,, , and tie rods, or other system approved by ENGINEER.
 - b. Pipe thrust restraint shall be in accordance with the Schedule of Restrained Pipe Lengths and as noted on the Project Drawings.
 - 2. Schedule of Restrained Pipe Lengths: Restrained pipe lengths shall conform to the requirements of AWWA M41 for ductile iron pipe. Restrained pipe lengths shall be as shown on the Construction Plans. For pipe not specifically illustrated on the Plans, CONTRACTOR shall submit a lay schedule identifying restrained lengths complying with AWWA M41.

3.3 WORK AFFECTING EXISTING PIPING

- A. Location of Existing Piping:
 - 1. Locations of existing piping shown should be considered approximate.
 - 2. CONTRACTOR shall determine the true locations of existing piping to which Work is to be performed, and locations of other facilities which could be disturbed during earthwork operations, or which may be affected by CONTRACTOR'S Work already installed.
- B. Taking Existing Pipelines Out of Service:
 - 1. Do not take pipelines out of services, unless specifically provided for under this Project or approved by ENGINEER.
 - 2. Notify ENGINEER at least 48 hours prior to taking pipeline out of service.
- C. Work on Existing Pipelines:
 - 1. Cut or tap pipes as shown or required with machines specifically designed for this Work.
 - 2. Install temporary plugs to prevent entry of mud, dirt, water, and debris.
 - 3. Provide all necessary adapters, fittings, pipe, and appurtenances required to complete the Work.

4. Existing pipelines that are cut and abandoned shall be adequately capped or filled with grout.

3.4 TESTING OF PIPING

A. General:

1. All testing shall conform to the MAG Standard Specifications 611. In case of contradiction with these Specifications the CONTRACTOR shall notify the ENGINEER before proceeding with the testing.
2. Test all piping except as otherwise authorized by ENGINEER.
3. Notify ENGINEER 48 hours in advance of testing.
4. Provide all testing apparatus, including pumps, hoses, gauges, and fittings.
5. Unless otherwise noted, pipelines shall hold specified test pressure for two hours.
6. Repair and retest pipelines that fail to hold specified test pressure or which exceed the allowable leakage rate.
7. Unless otherwise specified, test pressures required are at the lowest elevation of the pipeline section being tested.
8. Conduct all tests in the presence of ENGINEER.
9. Advise local authorities having jurisdiction if their presence is required during testing.
10. All testing shall conform to the MAG Standard Specifications. In case of contradiction with these Specifications the CONTRACTOR shall notify the ENGINEER before proceeding with the testing.

B. Schedule of Pipeline Tests:

1. Test piping at the test pressures listed in the Buried Piping Schedule and respective pipe material specification.
2. All piping shall be water tested after installation, except as otherwise specified or directed by ENGINEER.
3. For piping not included in the Schedule, the ENGINEER will notify CONTRACTOR in writing of the test pressure to be used.

C. Pressure Test Procedure:

1. Complete backfill and compaction at least to the pipe centerline before testing, unless otherwise required or approved by ENGINEER.
2. Allow concrete for thrust blocks to reach design strength before testing.
3. Fill section to be tested slowly with water and expel all air. Install corporation cocks, if necessary, to remove all air.
4. Test only one section of pipe at a time.
5. Apply specified test pressure for two hours and observe pressure gage. Check carefully for leaks while test pressure is being maintained.

D. Leakage Testing:

1. Conduct leakage test for all liquid piping after satisfactory completion of pressure test.

2. Allow concrete pipe to stand full of water at least 12 hours prior to starting leakage test.
3. Maintain test pressure constantly for the minimum test period and accurately measure the amount of water which must be added to maintain the test pressure.
4. Allowable Leakage Rates (in gallons per hour per 1,000 feet per inch diameter):
 - a. DIP Push-On or Mechanical Joints: 0.075.
 - b. Copper, Steel, and Thermoplastic: None.
5. Leakage Test Procedure:
 - a. Examine exposed pipe, joints, fittings, and valves. Repair visible leakage or replace the defective pipe, fitting, or valve.
 - b. Refill the line under test to reach the required test pressure.
 - c. Provide a test container filled with a known quantity of water at the start of the test. Attach the test pump suction to the test container.
 - d. Pump water from the test container into the line with the test pump to hold the specified test pressure for the test period. Water remaining in the container shall be measured and the amount used during the test shall be recorded on the test report.
 - e. Perform all repair, replacement, and retesting required because of failure to meet testing requirements.
 - f. Leakage shall be less than rate specified above.

3.5 DISPOSAL OF WATER

- A. CONTRACTOR shall provide suitable means for disposal of test and flushing water so that no damage results to facilities or waterways.
- B. Means of disposal of test and flushing water shall be subject to the approval of ENGINEER, local governing authorities, and regulatory agencies.
- C. CONTRACTOR shall be responsible for any damage caused by his water disposal operations.

3.6 CLEANING

- A. Cleaning:
 1. Thoroughly clean all piping and flush prior to placing in service in a manner approved by ENGINEER.
 2. Piping 24-inches in diameter and larger shall be inspected from inside and all debris, dirt and foreign matter removed.
 3. If piping that requires disinfection has not been kept clean during storage or installation, CONTRACTOR shall swab each section individually before installation with a 5% hypochlorite solution, to ensure clean piping.

3.7 PIPING SCHEDULE

A. The following abbreviations are used in the Buried Piping Schedule:

1. Service Abbreviations:
 - a. Potable Water: W.
 - b. Reclaimed Water: RW.
2. Material Abbreviations:
 - a. Asbestos Concrete Pipe: ACP
 - b. Chlorinated Polyvinyl Chloride: CPVC
 - c. Copper Pipe: COP
 - d. Ductile Iron Pipe: DIP
 - e. Glass-Lined Ductile Iron Pipe: GDIP
 - f. Galvanized Steel: GST
 - g. Polyethylene: PE
 - h. Polyvinyl Chloride: PVC
 - i. Stainless Steel Pipe: SST
 - j. Vitrified Clay Pipe: VCP
3. Lining/Coating Abbreviations:
 - a. Bituminous Coated: BC
 - b. Cement Mortar Lined: CM
 - c. Galvanized: GALV
 - d. Glass Lined: GL
 - e. Polyethylene Wrap: PE
 - f. Protecto 401 Ceramic Epoxy: CE
 - g. T-Lock: TL
 - h. Painting: P (Painted per Section 09900)
4. Joint Abbreviations:
 - a. Bell and Spigot: BS
 - b. Butt Wrapped: BW
 - c. Flanged: FL
 - d. Mechanical Joint: MJ
 - e. Soldered: SD
 - f. Solvent Welded: SW
 - g. Welded: W

BURIED PIPING SCHEDULE

Service	Material	Interior Lining	Exterior Coating	Pressure Class	Joint	Test Pressure (psig)
Reclaimed Water (Larger than 12-inch diameter)	DIP	CM	BC	250	MJ/BS	150

++ END OF SECTION ++

SECTION 15061

DUCTILE IRON PIPE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install ductile iron pipe and fittings.
 - 2. The extent of ductile iron pipe to be furnished is shown on the Drawings and in the schedules included in Section 15051, Buried Piping Installation.
- B. Definition: Where cast iron pipe is specified, the term and symbol shall mean ductile iron pipe.
- C. Related Work Specified Elsewhere:
 - 1. Section 02200, Earthwork.
 - 2. Section 11295, Hydraulic Valves.
 - 3. Section 15050, Piping Systems.
 - 4. Section 15051, Buried Piping Installation.

1.2 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall have a minimum of five years of experience in the production of ductile iron pipe and fittings and shall show evidence of satisfactory service in at least five installations.
- B. Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids). If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, whether or not the document has been superseded by a version with a later date, discontinued, or replaced.
 - 1. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings Class 25, 125, 250, and 800.
 - 2. ANSI B16.5 - Pipe Flanges and Flanged Fittings.
 - 3. ASTM C150 - Portland Cement.
 - 4. AWWA C104 (ANSI A21.4) - Cement Mortar Lining for Ductile Iron and Gray Iron Pipe and Fittings for Water.

5. AWWA C105 (ANSI A21.5) - Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids.
6. AWWA C110 (ANSI A21.10) - Ductile Iron and Gray Iron Fittings, 3" Through 48", for Water and Other Liquids.
7. AWWA C111 (ANSI A21.11) - Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings.
8. AWWA C115 (ANSI A21.15) - Flanged Ductile Iron and Gray Iron Pipe with Threaded Flanges.
9. AWWA C150 (ANSI A21.50) - Thickness Design of Ductile Iron Pipe.
10. AWWA C151 (ANSI A21.51) - Ductile Iron Pipe, Centrifugally Cast, in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
11. AWWA C153 (ANSI A21.53) - Ductile Iron Compact Fittings, 3" Through 12" for Water and Other Liquids.
12. AWWA C600 - Installation of Ductile Iron Water Mains and Their Appurtenances.
13. AWWA C606 - Grooved and Shouldered Type Joints.
14. MAG - Uniform Standard Specifications and Details for Public Work Construction.
15. City of Chandler Unified Standard Specifications.

1.3 SUBMITTALS

- A. Shall be in accordance with Section 15050, Piping Systems, submittal information.
- B. Each Shop Drawing submittal shall include a copy of the relevant Specification Section. Each and every paragraph of the Specification Section shall be clearly marked to indicate whether the requirements for equipment and/or services in the Specification Section are met. If clarifications are needed to any of the paragraphs in the Specification Section, they shall be addressed next to the paragraph or in an attached letter as such and explained further with any additional information necessary. If any exceptions and/or deviations are proposed to any of the Specifications, they shall be clearly noted as such in the submittal, and an explanation of any deviation and/or exception shall be provided. The CONTRACTOR shall furnish equipment and/or services as specified if an exception and/or deviation is rejected

PART 2 - PRODUCTS

2.1 GENERAL

- A. Pipe design, materials, and manufacturer shall comply with the following documents:

ITEM	DOCUMENT
Thickness Design	AWWA C150
Manufacturing Requirements: Water or Other Liquid	AWWA C151
Gravity Service Pipe	ASTM A716
Joints: Rubber Gasket Threaded Flange	AWWA C111 AWWA C115
Fittings: Water or Other Liquid	AWWA C110/AWWA C153
Cement Mortar Lining	AWWA C104
Polyethylene Encasement	AWWA C105

2.2 PIPE

- A. Unless otherwise specified, ductile iron pipe shall be Pressure Class 250 for below ground installations and Special Thickness Class 53 for above ground, and have nominal laying length of 18 feet.
- B. For grooved end pipe or flanged end, wall thickness shall be minimum Class 53, except where the specified pressure requires heavier pipe.
- C. All ductile iron pipes shall conform to the requirements of MAG Standard Specification Section 750 "Iron Water Pipe and Fittings."
- D. All ductile iron pipes shall be manufacturers as listed within the City of Chandler Approved Product List.

2.3 GASKETS

- A. Unless otherwise specified, gasket stock shall be a synthetic rubber compound in which the elastomer is nitrile or neoprene.
- B. The compound shall contain not less than 50% by volume nitrile or neoprene and shall be free from factice, reclaimed rubber, and other deleterious substances.

- C. Gaskets shall comply with AWWA C111 for push-on and mechanical joints, and with AWWA C606 for grooved end joints.
- D. For high temperature gaskets refer to section 15050, Piping Systems.

2.4 FITTINGS

- A. Parent pipe and branch outlets shall be centrifugally cast ductile iron pipe designed in accordance with ANSI/AWWA C150/A21.50 and manufactured in accordance with ANSI/AWWA C151/A21.51. Minimum class shall be Thickness Class 53.
- B. Ends shall be flanged, restrained mechanical joint, or restrained push-on to suit the condition specified, except for transmission mains where indicated otherwise on the Drawings.
- C. The AWWA C153 compact ductile iron fittings in sizes 3-inches through 12-inches are an acceptable substitute for standard fittings, unless otherwise specified.
- D. Long radius elbows shall be provided where specified.
- E. Welded-on outlets shall be limited to branch outlets having a nominal diameter less than 70% of the nominal diameter of the main line pipe (maximum size of 30-inches). Welded-on outlets may be provided for tees, tangential outlets, or lateral outlets fabricated at a specific angle to the main line pipe as shown on the Drawings. Welded-on outlets shall be fabricated by the pipe manufacturer at the same facility where the pipe is produced. The pipe cement mortar lining shall only be applied or repaired after the outlet has been welded on at the manufacturing facilities where the pipe is produced. The pipe manufacturer shall have a minimum of five years experience in the fabrication and testing of outlets of similar size and configuration as shown on the Drawings or specified herein.
- F. Weldment for welded-on outlets shall be based on the method described in Section VII of the ASME Unified Pressure Vessel Code. Reinforcing welds shall be placed using Ni-Rod FC 55 cored wire or Ni-Rod 55 electrodes manufactured by INCO Alloys (or an electrode with equivalent performance properties). Carbon steel electrodes are not acceptable.
- G. All ductile iron pipe fittings shall be as manufactured by the same manufacturer as the ductile iron pipe.

2.5 JOINTS

- A. Push-On Joints:
 - 1. Push-on joints shall be the rubber ring compression type suitable for buried service. Unrestrained push-on joints shall be Fastite Joint as manufactured by American Cast Iron Pipe Company, the Tyton Joint as manufactured by U.S. Pipe, or equal. This joint is not permitted on fittings or specials, unless otherwise specified. Push-on joints shall have an allowable deflection of up to

5 degrees at specified pressures. Joint assembly and field cuts shall be made in strict conformance with AWWA C600 and pipe manufacturer's recommendations.

B. Flange Assemblies:

1. Unless otherwise specified, flanges shall be ductile iron and shall be threaded-on flanges conforming to ANSI/AWWA A21.15/C115 or cast-on flanges conforming ANSI/AWWA A21.10/C110.
2. Flanges shall be adequate for 250 psi working pressure.
3. Bolt circle and bolt holes shall match those of ANSI B16.1, Class 125 flanges and ANSI B16.5, Class 150 flanges.
4. Where specified, flanges shall be threaded-on or cast-on flanges conforming to ANSI B16.1, Class 250.
5. Unless otherwise specified, bolts and nuts for flange assemblies shall conform with the requirements of Section 15120, Piping Specialties and Accessories. Gaskets shall be as specified with the requirements of Section 15120, Piping Specialties and Accessories.

C. Mechanical Joints:

1. Where specified, restrained mechanical joints shall be the positive restraint type. Mechanical joints with retainer glands are not acceptable.
2. Locked mechanical hydrant tees, bends, and adapters are an acceptable substitute for anchoring fire hydrants and valves to the pipe main.

D. Restrained Joints:

1. Unless otherwise specified, restrained joints shall be flanged or grooved end for exposed service and push-on or grooved end for buried service. Restrained pipe shall be applied the entire length of pipe as shown on the Construction Drawings.
2. Restrained joints for pipe shall be:
 - a. TR Flex Gripper Ring and TR Flex joint products with exact specifications as manufactured by US Pipe
 - b. American Fast Grip and Flex-Ring joint as manufactured by American Cast Iron Pipe Company
 - c. MEGALUG Ductile Iron Pipe Restraints as manufactured by EBAA Iron Inc.
 - d. Or equal.
3. Restrained joints for fittings shall be:
 - a. Series 1100 megalug restraint produced by EBAA Iron, Inc.
 - b. Series 3000-30000S Stargrip by Star Pipe Products
 - c. Sigma DIP One Lok SLDE Series
 - d. Tyler Union Tuf Grip Restraint
4. Restrained joints shall be capable of being deflected after full assembly.
5. Joint assembly shall be in strict conformance with AWWA C600 and manufacturer's recommendations.
6. No field cuts of restrained pipe are permitted without prior approval of the Construction Manager.

E. Bolts and Nuts:

1. Corrosion-resistant bolts and nuts for use with ductile iron joints shall be high-strength, low-alloy steel as specified in ANSI/AWWA C111/A21.11.
2. Below grade installations require type 316 stainless steel.

2.6 PIPE COATING

A. Unless otherwise specified, pipe and fittings shall be coated with asphaltic material as specified in AWWA C151.

B. Polyethylene Encasement:

1. All buried ductile iron pipe and fittings shall be wrapped with polyethylene film in tube form as specified in AWWA C105 and MAG Section 610.

2.7 PIPE LINING

A. Cement mortar lining.

B. Unless otherwise specified, interior surfaces of pipe and fittings shall be cement mortar lined in accordance with AWWA C104.

C. Cement shall be ASTM C150, Type II or V, low alkali, containing less than 0.60% alkalies.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Piping runs specified on the Drawings shall be followed as closely as possible. Proposed deviations shall be submitted in accordance with Section 01300, Submittals.
2. Pipe shall be installed in accordance with AWWA C600 and MAG Section 610.

B. Insulating Sections:

1. Where a metallic non-ferrous pipe or appurtenance is connected to ferrous pipe or appurtenance, an insulating section shall be provide.

C. Anchorage:

1. Anchorage shall be provided as specified. Calculations and Drawings for proposed alternative anchorage shall be submitted in accordance with Section 01300, Submittals.

3.2 ACCEPTANCE TESTING

- A. Hydrostatic pressure tests shall be conducted in accordance with Section 4 of AWWA C600, except that test pressures and allowable leakage shall be as listed in Section 15050, Piping Systems.
- B. The CONTRACTOR shall conduct the tests in the presence of the ENGINEER and/or OWNER.
- C. All welded-on outlets shall be rated for a working pressure of 250 psi and must have a minimum safety factor of 2.0 based on proof of design hydrostatic test results.
- D. Prior to the application of any coating or lining in the outlet area all weldments for branch outlets to be supplied on this project shall be subject to an air pressure test of at least 15 psi. Air leakage is not acceptable. Any leakage shall be detected by applying an appropriate soapy water solution to the entire exterior surface of the weldment and adjoining pipe edges or by immersing the entire area in a vessel of water and visually inspecting the weld surface for the presence of air bubbles. Any weldment that shows signs of visible leakage shall be repaired and retested in accordance with the manufacturer's written procedures.

3.3 POLYETHYLENE TUBE

- A. Polyethylene encasement shall be used on all buried ductile iron pipe, unless otherwise specified. Installation of polyethylene shall be as specified in MAG Section 610 and these Specifications. Pipe, fittings, valves, and couplings shall be wrapped. Fittings that require concrete backing shall be wrapped prior to placing the concrete.
- B. The polyethylene tube seams and overlaps shall be wrapped and held in place by means of a 2-inch wide plastic backed adhesive tape. The tape shall be Polyken No. 900 (polyethylene), Scotchwrap No. 50 (polyvinyl), or equal. The tape shall be such that the adhesive shall bond securely to both metal surfaces and polyethylene film. Bedding and initial backfill for polyethylene wrapped pipe shall be a well-graded granular material which will not cut or damage the polyethylene tube during placement and backfilling. Sharp angular material over 0.5-inches shall not be used with polyethylene encasement.

++ END OF SECTION ++

SECTION 15120

PIPING SPECIALTIES AND ACCESSORIES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install all piping specialties and accessories. Included, but not limited to, are flexible couplings, mechanical couplings, flanged adapters, expansion joints, saddle taps.
- B. Related Work Specified Elsewhere:
 - 1. Division 15, Mechanical, Sections on piping and piping systems.

1.2 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
 - 1. Manufacturer shall have a minimum of five years of experience in the production of substantially similar types of piping specialties specified and shall show evidence of satisfactory service in at least five installations.
 - 2. Each type of piping specialty and accessory shall be the product of one manufacturer.

1.3 SUBMITTALS

- A. Descriptive submittals shall be made in accordance with Section 01300, Submittals.
- B. Coordinate these with Shop Drawings required for the piping systems.
- C. Each Shop Drawing submittal shall include a copy of the relevant Specification Section. Each and every paragraph of the Specification Section shall be clearly marked to indicate whether the requirements for equipment and/or services in the Specification Section are met. If clarifications are needed to any of the paragraphs in the Specification Section, they shall be addressed next to the paragraph or in an attached letter as such and explained further with any additional information necessary. If any exceptions and/or deviations are proposed to any of the Specifications, they shall be clearly noted as such in the submittal, and an explanation of any deviation and/or exception shall be provided. The CONTRACTOR shall furnish equipment and/or services as specified if an exception and/or deviation is rejected.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Refer to Division 15, Mechanical, Sections on piping and piping systems.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Couplings: Unless otherwise specified, piping 2-inches in diameter and larger passing from concrete to earth shall be provided with two pipe couplings or flexible joints as specified within 2 feet or one pipe diameter of the structure, whichever is greater.
1. Below-Grade Restrained Type Coupling:
 - a. Pressure and Service: Same as connected piping.
 - b. Material: ASTM A536 Ductile Iron.
 - c. Gasket: Suitable for water service and specification 15050.
 - d. Bolts and Nuts: Type 316 stainless steel bolts and nuts.
 - e. Product and Manufacturer:
 - 1) Per City of Chandler Approved Product List.
 - 2) No approved equal.
 2. Sleeve Type, AC/DIP Transition Couplings:
 - a. Pressure and Service: Same as connected piping.
 - b. Material: Carbon steel for carbon steel and exposed ductile iron piping systems, or stainless steel for stainless steel and buried or submerged ductile iron piping systems.
 - c. Gasket: Suitable for water service – NSF 61 Certified.
 - d. Bolts and Nuts: Alloy steel, corrosion-resistant, prime coated. Buried couplings shall have Type 316 stainless steel bolts and nuts.
 - e. Harnessing:
 - 1) Harness couplings to restrain pressure piping. Test pressures for pressure pipelines shall conform to the requirements of Section 15050, Piping Systems.
 - 2) Adjacent flanges shall be tied with bolts of corrosion resistant alloy steel. Provide flange mounted stretcher bolt plates as shown on the Drawings and to be designed by manufacturer, unless otherwise approved by the ENGINEER.
 - 3) Conform to dimensions, size, spacing and materials for lugs, bolts, washers and nuts as recommended by manufacturer and approved by ENGINEER for the pipe size, wall thickness and test pressure required. However, the following minimum bolting shall be provided, unless otherwise approved by the ENGINEER.

Pipe		Bolt	
Diameter	Number	Diameter	At
<u>(Inches)</u>	<u>of Bolts</u>	<u>(Inches)</u>	<u>(Degrees)</u>
4	2	5/8	180
6-8	2	3/4	180
10-12	2	7/8	180 or 250
14-20	4	1	190
24-48	4	1	90
54	4	1	250
60	4	1-1/4	90

- f. Remove pipe stop, unless otherwise shown on the Drawings or specified.
- g. Product and Manufacturer: Provide one of the following:
 - 1) Type 501, Romac Industries.
 - 2) Or equal.
3. Flanged Adapters:
 - a. Description: One end of adapter shall be flanged and the other end shall have a sleeve type flexible coupling.
 - b. Pressure and Service: Same as connected piping.
 - c. Material: Cast iron or steel.
 - d. Gasket: Suitable for wastewater service, and can withstand the specified temperature. EPDM gaskets for 250° F air service. Specification 15050.
 - e. Bolts and Nuts: Type 316 stainless steel.
 - f. Harnessing:
 - 1) Harness adapters to restrain pressure piping. Test pressures for pressure pipe lines are included in the piping schedules in Section 15051, Buried Piping Installation, and section 15052, Exposed Piping Installation.
 - 2) For adapters 12-inch diameter and less, provide 1/2-inch minimum stainless steel anchor studs installed in a pressure tight anchor boss. Provide number of studs required to restrain test pressure and service conditions. Harness shall be as designed and recommended by manufacturer; however, the following minimum anchor studs shall be provided, unless otherwise approved by ENGINEER.
 - a) 6-inch Diameter and Less: Two.
 - b) 8-inch Diameter and Less: Four.
 - c) 10-inch Diameter and Less: Six.
 - d) 12-inch Diameter and Less: Eight.

- 3) For adapters larger than 12-inch diameter, provide split-ring harness clamps with a minimum of four Type 316 stainless steel bolts. Harness assembly shall be as designed and recommended by manufacturer. Dimensions, sizes, spacing, and materials shall be suitable for service and conditions encountered and shall be approved by ENGINEER.
- 4) Harness couplings to restrain pressure piping.
- 5) Test pressures for pressure pipe lines are included in Section 15051, Buried Piping Installation, and Section 15052, Exposed Piping Installation.
- 6) Harnessing shall conform to the details shown on the Drawings.
- g. Product and Manufacturer: Provide one of the following:
 - 1) Style FCA501, as manufactured by Romac Industries.
 - 2) Style 128, as manufactured by Dresser.
 - 3) Or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install piping specialties and accessories in accordance with manufacturer's instructions.
- B. Make adjustments to expansion joints as required to ensure that they will be fully extended when the ambient temperature is at minimum operating temperature and fully compressed at maximum operating temperature for the system in which they are installed.

++ END OF SECTION ++

EXHIBIT D

GIS / GPS DATA DELIVERY REQUIREMENTS

GIS / GPS Data Delivery Requirements

Contractor shall provide survey grade GPS / GIS data, meeting the following requirements for all facilities to be owned and/or operated by the City of Chandler.

a) ESRI File Geodatabase format:

All GPS point data, along with corresponding GIS Attribute data, must be submitted in ESRI File Geodatabase format. The City of Chandler will provide a copy of the File Geodatabase in ESRI ArcGIS format. Please submit your request through the Project Manager.

b) Data dictionary and Attribute data:

Attribute data should be provided for each of the GPS'd Utility Features listed in Section 'd' below. All Attribute data should conform to the ESRI File Geodatabase format, provided by the City. A copy of the data dictionary is also attached here for reference.

c) Coordinate System:

Horizontal Datum: Arizona State Plane Coordinates, Central Zone NAD83 (HARN)
Vertical Datum: NAVD88

d) Point Data for GPS:

1) Water System Features:

- Water main location (top of pipe), size and material (one (1) coordinate provided every 100 feet minimum) and at fittings.
- Water fitting location (top of feature), size, material and type including: Bend (22.5, 45, or 90), Tee, Tapping Sleeve, Cross, Coupling, End Cap, Line Stop, Reducer, Saddle, Other.
- Water valve location (center of valve box cover), size and type.
- Fire hydrant location (top of hydrant), manufacturer and year.
- Water service line location (at connection to main, any bends, and termination at meter box or meter vault or at the edge of easement or ROW), size and material.
- Water blow-off and air release valve location (center of cover), size, type and manufacturer.
- Water manhole or vault location (center of cover), size and type.

2) Waste Water System Features:

- Sewer manhole and cleanout location (center of cover), size, material, and cover type.
- Sewer gravity main location (invert of pipe), size, material and flow direction (from) at all manholes, cleanouts and structures.
- Sewer service line location, size and material (at connection to main, and termination at cleanout, or stub out at edge of the easement or ROW).
- Sewer force main location (top of pipe), size, and material (one (1) coordinate provided every 100 feet minimum) and at fittings.

- Sewer force main (and gravity) fitting location (top of feature), size, material and type including: Bend (22.5, 45, or 90), Tee, Tapping Sleeve, Cross, Coupling, End Cap, Linestop, Reducer, Saddle, Wye, Other
- Sewer force main valve location (center of valve box cover), size and type.
- Sewer force main air release valve location (center of cover), size, type and manufacturer.
- Sewer force main manhole or vault location (center of cover), size and material.
- Sewer structure (center of structure), type (diversion, junction box).

3) Reclaimed Water System Features:

- Reclaimed main location (top of pipe), size, and material (one (1) coordinate provided every 100 feet minimum) and at fittings.
- Reclaimed fitting location (top of feature), size, material and type including: Bend (22.5, 45, or 90), Tee, Tapping Sleeve, Cross, Coupling, End Cap, Linestop, Reducer, Saddle, Other.
- Reclaimed valve location (center of valve box cover), size and type.
- Reclaimed service line location (at connection to main, any bends, and termination at meter box or meter vault or at the edge of easement or ROW), size and material.
- Reclaimed blow-off and air release valve location (center of cover), size, type and manufacturer.
- Reclaimed manhole or vault location (center of cover), size and type.

4) Storm Water System Features:

- Storm manhole and cleanout location (center of cover), size, material, and cover type.
- Storm gravity main location (invert of pipe), size, material, and flow direction (from) at all manholes, cleanouts and structures.
- Storm structure location (center of structure), type and category including: Drywell, Catch Basin, Scupper, Bubbler Box, and Collection Vault.

5) Streetlight Feature:

- Streetlights

6) Standard GPS Metadata on all points collected: Date, Time, Horizontal Accuracy, Vertical Accuracy, Latitude, Longitude, Altitude, Surveyor, and Comments.

7) Electronic Data Submittal: Each submittal must consist of

- ESRI – ArcGIS Geodatabase with cumulative data and attributes
- Construction plans with collected utilities clearly redlined and changes marked

The frequency of data submittals will be every two weeks after water, sewer, reclaim or storm assets go into the ground. Please email submittals to: GIS@chandleraz.gov

DATA DICTIONARY: WATER

WATER_BACKFLOW				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	25	GIS_BACKFLOW_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	25	GIS_BACKFLOW_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	25	GIS_BACKFLOW_SPATIALSOURCE
SIZE	SIZE	Double		
TYPE	TYPE	Text	25	GIS_BACKFLOW_TYPE
MANUFACTURER	MANUFACTURER	Text	25	GIS_BACKFLOW_MANUFACTURER
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	15	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	30	

WATER_FITTING				
Field Name	Alias Name	Data Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	20	WS_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	20	WS_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	20	WS_SPATIALSOURCE_STD
MATERIAL	MATERIAL	Text	20	WS_FITTING_MATERIAL
DIAMETER1	DIAMETER1	Text	8	RWS_FITTING_DIAMETER
DIAMETER2	DIAMETER2	Text	8	RWS_FITTING_DIAMETER
TYPE	TYPE	Text	30	WS_FITTING_TYPE
BEND	BEND	Text	20	WS_FITTING_BEND
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	30	

WATER_HYDRANT				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	Feature Owner	Text	25	WS_FEATUREOWNER
LIFECYCLESTATUS	Lifecycle Status	Text	25	WS_LIFECYCLESTATUS
SPATIALSOURCE	Spatial Source	Text	25	WS_SPATIALSOURCE_STD
BARRELDIAMETER	Barrel Diameter	Double		
LARGENOZZLEDIAMETER	Large Nozzle Diameter	Double		
SMALLNOZZLEDIAMETER	Small Nozzle Diameter	Double		
OUTLETCONFIGURATION	Outlet Configuration	Double		
SEATDIAMETER	Seat Diameter	Double		
MANUFACTURER	Manufacturer	Text	25	WS_HYD_MANUFACTURER
YEARMANUFACTURED	Manufacture Year	Text	25	
HASLOCK	Has Lock ?	Text	25	GIS_BOOLEAN_YES_NO
COLOR	Color	Text	25	WS_HYD_COLOR
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	25	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	50	

WATER_MANHOLE				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	20	WS_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	20	WS_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	20	WS_SPATIALSOURCE_STD
ACCESSDIAMETER	ACCESSDIAMETER	Text	8	
ACCESSTYPE	ACCESSTYPE	Text	20	
GROUNDTYPE	GROUNDTYPE	Text	20	WS_SYSVAL_GROUNDTYPE
COVERMATERIAL	COVERMATERIAL	Text	10	
COVERTYPE	COVERTYPE	Text	8	
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	30	

WATER_METER				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	Feature Owner	Text	20	GBA_WMSL_FEATUREOWNER
LIFECYCLESTATUS	Lifecycle Status	Text	25	GBA_WMSL_LIFECYCLESTATUS
SPATIALSOURCE	Spatial Source	Text	25	GBA_STATIC_SPATIALSOURCE
DIAMETER	DIAMETER	Double		WS_METER_DIAM
MANUFACTURER	Manufacturer	Text	25	WS_METER_MANUFACTURER
METER_TYPE	Meter Type	Text	25	WS_METER_TYPE
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	15	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	30	

WATER_SYSTEM_VALVE				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATURE OWNER	Text	20	WS_SYSVAL_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLE STATUS	Text	20	WS_SYSVAL_LIFECYCLESTATUS
SPATIALSOURCE	SPATIAL SOURCE	Text	20	WS_SYSVAL_SPATIALSOURCE
TYPE	TYPE	Text	25	WS_SYSVAL_TYPE
VALVETYPE	VALVE TYPE	Text	10	WS_SYSVAL_VALVETYPE
FUNCTION	FUNCTION	Text	25	WS_SYSVAL_FUNCTION
GROUNDTYPE	GROUNDTYPE	Text	25	WS_SYSVAL_GROUNDTYPE
DIAMETER	Diameter	Text	8	WS_SYSVAL_DIAM
GPS_DATE	GPS DATE	Date		
GPS_TIME	GPS TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS COMMENT	Text	30	

Water Domains:

Domain name	WS_LIFECYCLESTATUS
ABANDONED	ABANDONED
ACTIVE	ACTIVE
FUTURE	FUTURE
INACTIVE	INACTIVE
REMOVED	REMOVED
UNKNOWN	UNKNOWN

Domain name	WS_SYSVAL_SPATIALSOURCE
APPROVED PLANS	APPROVED PLANS
ASBUILT	ASBUILT
DESIGN	DESIGN
GPS	GPS
HYDRMAINT	HYDRMAINT
ORTHOPHOTO	ORTHOPHOTO
TM7	TM7
UNKNOWN	UNKNOWN

Domain name	WS_HYD_MANUFACTURER
AMERICANDARLING	AMERICANDARLING
AVK	AVK
CLOW	CLOW
DRESSER	DRESSER
GREENBERG	GREENBERG
KENNEDY	KENNEDY
MUELLER	MUELLER
PACIFIC	PACIFIC
UNKNOWN	UNKNOWN
WATEROUS	WATEROUS

Domain name	WS_FEATUREOWNER
COC	Chandler
COG	Gilbert
COM	Mesa
COP	Phoenix
COT	Tempe
COUNTY	Maricopa County
GOULD	Gould
GRIC	GRIC
INTEL	Intel
MICROCHIP	Microchip
MOTOROLA	Motorola
PRIVATE	Private
SRP	SRP
SRVWUA	SRVWUA
UNKNOWN	UNKNOWN

Domain name	WS_SYSVAL_LIFECYCLESTATUS
FUTURE	FUTURE
UNKNOWN	UNKNOWN
INACTIVE	INACTIVE
ACTIVE	ACTIVE
REMOVED	REMOVED
ABANDONED	ABANDONED

Domain name	WS_FITTING_BEND
HORIZONTAL	HORIZONTAL
VERTICAL	VERTICAL

Domain name	WS_SYSVAL_DIAM
2	2
3	3
4	4
6	6
8	8
10	10
12	12
16	16
20	20
24	24
30	30
36	36
42	42
48	48
54	54

Domain name	WS_HYD_COLOR
0	YELLOW
1	BLACK/YELLOW
2	RED
3	UNKNOWN

Domain name	WS_FITTING_TYPE
11B	11B
22B	22B
45B	45B
90B	90B
COUPLING	COUPLING
CROSS	CROSS
ENDCAP	ENDCAP
LINESTOP	LINESTOP
OTHER	OTHER
REDUCER	REDUCER
SADDLE	SADDLE
TAPPING SLEEVE	TAPPING SLEEVE
TEE	TEE
UNKNOWN	UNKNOWN
WYE	WYE

Domain name	WS_SYSVAL_GROUNDTYPE
CONCRETE	CONCRETE
ASPHALT	ASPHALT
LANDSCAPE	LANDSCAPE
UNKNOWN	UNKNOWN

Domain name	WS_SPATIALSOURCE_STD
ASBUILT	ASBUILT
DESIGN	DESIGN
FIELD	FIELD
GPS	GPS
ORTHOPHOTO	ORTHOPHOTO
UNKNOWN	UNKNOWN

Domain name	WS_METER_DIAM
0.63	.63
0.75	.75
1	1
1.5	1.5
2	2
2.5	2.5
3	3
4	4
6	6
8	8
10	10

Domain name	WS_METER_MANUFACTURER
BADGER METERS	BADTER METERS
NEPTUNE METERS	NEPTUNE METERS
PRECISION METERS	PRECISION METERS
BADGER-NEPTUNE	BADGER-NEPTUNE
SENSUS	SENSUS

Domain name	WS_METER_TYPE
BYPASS	BYPASS
COMBO	COMBO
CMPND	CMPND
DISC	DISC
MAG	MAG
FDTEC	FDTEC
MLTJET	MLTJET
TURBIN	TURBIN
Ultrasonic	Ultrasonic

S

Domain name	WS_SYSVAL_FEATUREOWNER
COC	COC
PRIVATE	PRIVATE
COM	COM
MOTOROLA	MOTOROLA
INTEL	INTEL
UNKNOWN	UNKNOWN
TOG	TOG

Domain name	WS_FITTING_MATERIAL
DI	DI
PVC	PVC
BRASS	BRASS
STL	STL
COPPER	COPPER
AC	AC
CC	CC
CI	CI

Domain name	WS_SYSVAL_TYPE
STANDARD	STANDARD
BLOWOFF	BLOWOFF
ARV	ARV
AIR VACUUM	AIR VACUUM
PERMASEAL	PERMASEAL

Domain name	GBA_WMSI_LIFECYCLESTATUS
Operational	Operational
Empty	Empty
Out of Service	Out of Service
Abandoned	Abandoned

Domain name	WS_SYSVAL_FUNCTION
INLINE	INLINE
HYDRANT	HYDRANT
STUBOUT	STUBOUT
UNKNOWN	UNKNOWN
SERVICE	SERVICE
BYPASS	BYPASS
WPF	WPF
FDC	FDC
VAULT	VAULT
BACKFLOW	BACKFLOW
PUMPOUT	PUMPOUT
PUMPSTATION	PUMPSTATION
FIRELINE	FIRELINE
ARV	ARV
ZONE_SPLIT_VALVES	ZONE_SPLIT_VALVES

Domain name	GIS_BACKFLOW_FEATUREOWNER
COC	COC
PRIVATE	PRIVATE
CONTRACTOR	CONTRACTOR
INTEL	INTEL
OCA	OCA
OMG	OMG
TOG	TOG
UNKNOWN	UNKNOWN

Domain name	WS_SYSVAL_VALVETYPE
GATE	GATE
BUTTERFLY	BUTTERFLY
BALL	BALL
PLUG	PLUG
PIV	PIV
UNKNOWN	UNKNOWN
INSERTA	INSERTA

Domain name	GIS_BACKFLOW_MANUFACTURER
FEBCO	FEBCO
WATTS	WATTS
WILKINS	WILKINS
AMES	AMES
CONBRACO	SERVICE
HERSEY	HERSEY
RAIN BIRD	RAIN BIRD
APOLLO VALVES	APOLLO VALVES
METRON	METRON
OTHER	OTHER

Domain name	GIS_BACKFLOW_TYPE
Air Gap	Air Gap
Unknown	Unknown
Double Check Detector	Double Check Detector
Pressure Vacuum Breaker	Pressure Vacuum Breaker
Double Check	Double Check
Reduced Pressure Detector	Reduced Pressure Detector
Atmospheric Vacuum Breaker	Atmospheric Vacuum Breaker

DATA DICTIONARY: SEWER

SEWER CLEANOUT				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	20	WW_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	20	WW_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	20	WW_SPATIALSOURCE
RIM_ELEV	RIM_ELEV	Double		
INV_ELEV	INV_ELEV	Double		
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	30	

SEWER CONTROL VALVE				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	20	WW_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	20	WW_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	20	WW_SPATIALSOURCE
TYPE	TYPE	Text	25	WW_CONTROL_VALVE_TYPE
DIAMETER	DIAMETER	Text	8	
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	30	

SEWER_FITTING				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	20	WW_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	20	WW_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	20	WW_SPATIALSOURCE
MATERIAL	MATERIAL	Text	20	WW_FITTING_MATERIAL
TYPE	TYPE	Text	30	WW_FITTING_TYPE
BEND	BEND	Text	20	WW_FITTING_BEND
SIZE	SIZE	Text	20	
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	30	

SEWER_MANHOLE				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	25	WW_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	25	WW_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	20	WW_SPATIALSOURCE
TYPE	TYPE	Text	20	WW_MH_TYPE
COVER_MATERIAL	COVER_MATERIAL	Text	25	WW_MH_COVER_MATERIAL
COVER_HOLE	COVER_HOLE	Text	25	WW_MH_COVER_HOLE
COVER_SIZE	COVER_SIZE	Text	20	WW_MH_COVER_SIZE
RIM_ELEV	RIM_ELEV	Double		
INV_ELEV	INV_ELEV	Double		
LINING	LINING	Text	255	WW_MH_LINER
WALL_MATERIAL	WALL_MATERIAL	Text	255	WW_MH_WALL_MATERIAL
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	30	

Sewer Domains:

Domain name	WW_FEATUREOWNER
COC	COC
PRIVATE	PRIVATE
TOG	TOG
UNKNOWN	UNKNOWN

Domain name	WW_SPATIALSOURCE
GPS	GPS
ASBUILT	ASBUILT
UNKNOWN	UNKNOWN

Domain name	WW_MH_COVER_HOLE
UNKNOWN	UNKNOWN
SEALED	SEALED

Domain name	WW_MH_LINER
CAST-IN-PLACE	CAST-IN-PLACE
CEMENTITIOUS	CEMENTITIOUS
COMPOSITE	COMPOSITE
CURED-IN-PLACE	CURED-IN-PLACE
EPOXY	EPOXY
FR PLASTIC INSERT	FR PLASTIC INSERT
FR POLYMER INSERT	FR POLYMER INSERT
INSERT	INSERT
UNKNOWN	UNKNOWN

Domain name	WW_LIFECYCLESTATUS
ABANDONED	ABANDONED
ACTIVE	ACTIVE
INACTIVE	INACTIVE
PULLED	PULLED
UNKNOWN	UNKNOWN

Domain name	WW_MH_COVER_MATERIAL
ALUMINUM	ALUMINUM
CASTIRON	CASTIRON
HDPE COMPOSITE - CAP	HDPE COMPOSITE - CAP
HDPE COMPOSITE - EJ	HDPE COMPOSITE - EJ
HDPE COMPOSITE - HD20	HDPE COMPOSITE - HD20
STEEL	STEEL
UNKNOWN	UNKNOWN

Domain name	WW_MH_COVER_SIZE
0	Unknown
4	4
6	6
8	8
22	22
24	24
26	26
28	28
30	30
32	32
38	38
48	48
60	60

Domain name	WW_MH_WALL_MATERIAL
NONE	NONE
COMPOSITE	COMPOSITE
UNKNOWN	UNKNOWN
CONCRETE	CONCRETE
POURED	POURED
TLOCK	TLOCK
PRECAST	PRECAST
BRICK	BRICK

Domain name	WW_FITTING_MATERIAL
PVC	PVC
DIP	DIP
HDPE	HDPE
RCP	RCP
ACP	ACP
ABS	ABS
RUBBER	RUBBER
CONCRETE	CONCRETE
CLAY	CLAY
STEEL ENCASED VCP	STEEL ENCASED VCP
TLOCK LINE	TLOCK LINE
LINED RCP	LINED RCP
PVC LINED RCP	PVC LINED RCP
PVC LINED DIP	PVC LINED RCP

Domain name	WW_FITTING_BEND
HORIZONTAL	HORIZONTAL
VERTICAL	VERTICAL
NONE	NONE

Domain name	WW_MH_TYPE
0	UNKNOWN
1	SANITARY SEWER
2	ARV

Domain name	WW_FITTING_TYPE
TEE	TEE
WYE	WYE
90 BEND	90 BEND
45 BEND	45 BEND
22 BEND	22 BEND
11 BEND	11 BEND
ENCAP	ENCAP
PLUG	PLUG
REDUCER	REDUCER
ARV	ARV
FLOW METER	FLOW METER
NO FLOW POINT	NO FLOW POINT
OWNERSHIP CHANGE	OWNERSHIP CHANGE
OTHER	OTHER
UNKNOWN	UNKNOWN
COUPLING	COUPLING

Domain name	WW_CONTROL_VALVE_TYPE
AIRRELEASE	AIRRELEASE
AIRVACUUMRELEASE	AIRVACUUMRELEASE
PRESSURERELIEF	PRESSURERELIEF
VACUUMRELEASE	VACUUMRELEASE
UNKNOWN	UNKNOWN
N/A	N/A

DATA DICTIONARY: RECLAIM

RECLAIM_WATER_BACKFLOW				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	25	GIS_BACKFLOW_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	25	GIS_BACKFLOW_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	25	GIS_BACKFLOW_SPATIALSOURCE
SIZE	SIZE	Double		
TYPE	TYPE	Text	25	GIS_BACKFLOW_TYPE
MANUFACTURER	MANUFACTURER	Text	25	GIS_BACKFLOW_MANUFACTURER
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	15	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	30	

RECLAIM_WATER_FITTING				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	20	RWS_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	20	RWS_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	20	RWS_SPATIALSOURCE
MATERIAL	MATERIAL	Text	20	RWS_MAIN_OR_SERVICE_MATERIAL
DIAMETER1	DIAMETER1	Text	8	RWS_FITTING_DIAMETER
DIAMETER2	DIAMETER2	Text	8	RWS_FITTING_DIAMETER
TYPE	TYPE	Text	30	RWS_FITTING_TYPE
BEND	BEND	Text	20	RWS_FITTING_BEND
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double	8	
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double	8	
GPS_COMMENT	GPS_COMMENT	Text	30	

RECLAIM_WATER_MANHOLE				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	20	RWS_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	20	RWS_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	20	RWS_SPATIALSOURCE
ACCESSDIAMETER	ACCESSDIAMETER	Text	8	
ACCESSTYPE	ACCESSTYPE	Text	20	
GROUNDTYPE	GROUNDTYPE	Text	20	RWS_GROUNDTYPE
COVERMATERIAL	COVERMATERIAL	Text	10	RWS_COVER_MATERIAL
COVERTYPE	COVERTYPE	Text	8	RWS_COVER_TYPE
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	30	

RECLAIM_WATER_METER				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	Feature Owner	Text	20	GBA_WMSL_FEATUREOWNER
LIFECYCLESTATUS	Lifecycle Status	Text	25	GBA_WMSL_LIFECYCLESTATUS
SPATIALSOURCE	Spatial Source	Text	25	GBA_STATIC_SPATIALSOURCE
DIAMETER	DIAMETER	Double		RWS_METER_DIAM
MANUFACTURER	Manufacturer	Text	25	RWS_METER_MANUFACTURER
METERTYPE	Meter Type	Text	25	RWS_METERTYPE
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	15	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	30	

RECLAIM WATER SYSTEM VALVE				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATURE OWNER	Text	20	RWS_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLE STATUS	Text	20	RWS_LIFECYCLESTATUS
SPATIALSOURCE	SPATIAL SOURCE	Text	20	RWS_SPATIALSOURCE
TYPE	TYPE	Text	25	RWS_SYSVAL_TYPE
VALVETYPE	VALVE TYPE	Text	10	RWS_SYSVAL_VALVETYPE
FUNCTION	FUNCTION	Text	25	RWS_SYSVAL_FUNCTION
GROUNDTYPE	GROUNDTYPE	Text	25	RWS_SYSVAL_GROUNDTYPE
DIAMETER	DIAMETER	Double		RWS_SYSVAL_DIAM
GPS_DATE	GPS DATE	Date	8	
GPS_TIME	GPS TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS COMMENT	Text	30	

Reclaim Water Domains:

Domain name	RWS_SYSVAL_VALVETYPE
BALL	BALL
BUTTERFLY	BUTTERFLY
GATE	GATE
INSERTA	INSERTA
PIV	PIV
PLUG	PLUG
UNKNOWN	UNKNOWN

Domain name	RWS_SYSVAL_FUNCTION
ARV	ARV
INLINE	INLINE
PUMPOUT	PUMPOUT
PUMPSTATION	PUMPSTATION
SERVICE	SERVICE
STUBOUT	STUBOUT
UNKNOWN	UNKNOWN
VAULT	VAULT

Domain name	RWS_SYSVAL_TYPE
ARV	ARV
AIR VACUUM	AIR VACUUM
BLOWOFF	BLOWOFF
PERMASEAL	PERMASEAL
STANDARD	STANDARD

Domain name	RWS_FITTING_BEND
HORIZONTAL	HORIZONTAL
VERTICAL	VERTICAL

Domain name	RWS_MAIN_OR_SERVICE_MATERIAL
AC	AC
CC	CC
CI	CI
CU	COPPER
DI	DI
PVC	PVC
UNKNOWN	UNKNOWN
AC	AC
CC	CC

Domain name	RWS_FITTING_TYPE
11B	11B
22B	22B
45B	45B
90B	90B
COUPLING	COUPLING
CROSS	CROSS
ENDCAP	ENDCAP
LINESTOP	LINESTOP
MECHANICAL JOINT	MECHANICAL JOINT
OTHER	OTHER
RECHARGE WELL	RECHARGE WELL
REDUCER	REDUCER
SADDLE	SADDLE
TAPPING SLEEVE	TAPPING SLEEVE
TEE	TEE
UNKNOWN	UNKNOWN
WYE	WYE

Domain name	RWS_SPATIALSOURCE
ASBUILT	ASBUILT
FIELD	FIELD
GPS	GPS
ORTHOPHOTO	ORTHOPHOTO
UNKNOWN	UNKNOWN

Domain name	RWS_LIFECYCLESTATUS
ABANDONED	ABANDONED
ACTIVE	ACTIVE
INACTIVE	INACTIVE
REMOVED	REMOVED
UNKNOWN	UNKNOWN

Domain name	RWS_SYSVAL_DIAM
1.5	1.5
2	2
3	3
4	4
6	6
8	8
10	10
12	12
16	16
20	20
24	24
30	30
36	36
42	42
48	48
9999	UNKNOWN

Domain name	RWS_GROUNDTYPE
ASPHALT	ASPHALT
CONCRETE	CONCRETE
DIRT	DIRT
UNKNOWN	UNKNOWN

Domain name	RWS_SYSVAL_GROUNDTYPE
ASPHALT	ASPHALT
CONCRETE	CONCRETE
LANDSCAPE	LANDSCAPE
UNKNOWN	UNKNOWN

Domain name	RWS_FITTING_DIAMETER
0.63	0.63
0.75	0.75
1	1
1.25	1.25
1.5	1.5
2	2
2.5	2.5
3	3
4	4
6	6
8	8
10	10
12	12
15	15
16	16
18	18
20	20
24	24
30	30

Domain name	RWS_COVER_MATERIAL
CAST IRON	CAST IRON
ALUMINUM	ALUMINUM
UNKNOWN	UNKNOWN

Domain name	RWS_COVER_TYPE
SEALED	SEALED
VENTED	VENTED
BOLTED	BOLTED
UNKNOWN	UNKNOWN

Domain name	RWS_METER_MANUFACTURER
BADGER METERS	BADGER METERS
NEPTUNE METERS	NEPTUNE METERS
PRECISION METERS	PRECISION METERS
BADGER-NEPTUNE	BADGER-NEPTUNE
SENSUS	SENSUS

Domain name	RWS_METERTYPE
BYPASS	BYPASS
COMBO	COMBO
CMPND	CMPND
DISC	DISC
MAG	MAG
FDTEC	FDTEC
MLTJET	MLTJET
TURBIN	TURBIN

Domain name	RWS_METER_DIAM
0.63	.63
0.75	.75
1	1
1.5	1.5
2	2
2.5	2.5
3	3
4	4
6	6
8	8
10	10

Domain name	RWS_FEATUREOWNER
COC	CHANDLER
COM	MESA
INTEL	INTEL
OCA	OCA
OMG	OMG
PRIVATE	PRIVATE
SRP	SRP
TOG	GILBERT
UNKNOWN	UNKNOWN

DATA DICTIONARY: STORM

STORM_BUBBLER_BOX				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	25	SWS_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	25	SWS_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	25	SWS_SPATIALSOURCE
GRATE_OPENINGS_NUM	GRATE_OPENINGS_NUM	Short		SWS_GRATE_OPENINGS
GRATE_LENGTH	GRATE_LENGTH	Double	8	SWS_GRATE_LENGTH
GRATE_WIDTH	GRATE_WIDTH	Double	8	SWS_GRATE_WIDTH
DRYWELL_ASSOC	DRYWELL_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	50	

STORM_CATCHBASIN				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	25	SWS_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	25	SWS_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	25	SWS_SPATIALSOURCE
STRUCTURE_TYPE	STRUCTURE_TYPE	Short		SWS_STRUCTURE_TYPE
CATCHBASIN_TYPE	CATCHBASIN_TYPE	Text	25	SWS_CB_TYPE
CITY_EMBLEM	CITY_EMBLEM	Text	5	GIS_BOOLEAN_YES_NO
ACCESS_OPENING_TYPE	ACCESS_OPENING_TYPE	Text	25	SWS_CB_ACCESS_OPENING_TYPE
GRATE_LENGTH	GRATE_LENGTH	Double		SWS_GRATE_LENGTH
GRATE_WIDTH	GRATE_WIDTH	Double		SWS_GRATE_WIDTH
LID	LID	Text	5	GIS_BOOLEAN_YES_NO
LID_TYPE	LID_TYPE	Text	25	SWS_CB_LID_TYPE
DRYWELL_CONN	DRYWELL_CONN	Text	5	GIS_BOOLEAN_YES_NO
OUTLET_CONN	OUTLET_CONN	Text	5	GIS_BOOLEAN_YES_NO
BUBBLERBOX_CONN	BUBBLERBOX_CONN	Text	5	GIS_BOOLEAN_YES_NO
BUBBLERBOX_DRYWELL_ASSOC	BUBBLERBOX_DRYWELL_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
LAKE_DRAIN	LAKE_DRAIN	Text	5	GIS_BOOLEAN_YES_NO
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	50	

STORM_COLLECTION_VAULT				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	20	SWS_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	20	SWS_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	20	SWS_SPATIALSOURCE
INLET_NUM	INLET_NUM	Short		SWS_CV_NUMB_INLETS
INLET_DIAM	INLET_DIAM	Short		SWS_CV_PIPE_SIZE
INLET_PIPE_TYPE	INLET_PIPE_TYPE	Text	30	SWS_CV_PIPE_TYPE
NUISANCE_LINE_ASSOC	NUISANCE_LINE_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
DRYWELL_ASSOC	DRYWELL_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
LID_GRATE	LID_GRATE	Text	5	SWS_LID_GRATE
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	50	

STORM_DRAIN_MANHOLE				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	25	SWS_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	25	SWS_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	25	SWS_SPATIALSOURCE
STRUCTURE_TYPE	STRUCTURE_TYPE	Short	2	SWS_STRUCTURE_TYPE
CHANDLER_NAME	CHANDLER_NAME_ON_LID	Text	5	GIS_BOOLEAN_YES_NO
DIAMETER	DIAMETER	Short	2	SWS_SDMH_SIZE
VENT_HOLE	VENT_HOLE	Text	30	GIS_BOOLEAN_YES_NO
ACCESS_OPENING_TYPE	ACCESS_OPENING_TYPE	Text	25	SWS_SDMH_ACCESS_OPENING_TYPE
LID_TYPE	LID_TYPE	Text	30	SWS_SDMH_TYPE
LID_TEXT	LID_TEXT	Text	30	SWS_SDMH_LID_TEXT
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	50	

STORM_DRYWELL				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	25	SWS_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	25	SWS_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	25	SWS_SPATIALSOURCE
FIELD_LOC	FIELD_LOC	Text	100	SWS_DW_LOCATION
INSTALLER	INSTALLER	Text	30	SWS_DW_INSTALLER
CHAMBER_TYPE	CHAMBER_TYPE	Text	30	SWS_DW_CHAMBER_TYPE
LID_SIZE	LID_SIZE	Short		SWS_DW_LID_SIZE
LID_TYPE	LID_TYPE	Text	25	SWS_DW_LID_TYPE
NUISANCE_LINE_ASSOC	NUISANCE_LINE_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
CONCRETE_PAD	CONCRETE_PAD	Text	5	GIS_BOOLEAN_YES_NO
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	50	

STORM_INLET				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	25	SWS_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	25	SWS_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	25	SWS_SPATIALSOURCE
CATCHBASIN_TYPE	CATCHBASIN_TYPE	Text	25	SWS_CB_TYPE
FIELD_LOC	FIELD_LOC	Text	100	SWS_FIELD_LOC
GRATE_ASSOC	GRATE_ASSOC	Text	25	GIS_BOOLEAN_YES_NO
GRATE_LENGTH	GRATE_LENGTH	Double		SWS_GRATE_LENGTH
GRATE_WIDTH	GRATE_WIDTH	Double		SWS_GRATE_WIDTH
INLET_PIPE_DIAM	INLET_PIPE_DIAM	Short		SWS_INLET_PIPE_DIAM
INLET_NUMBER	NUMBER_OF_INLETS	Short		SWS_INLET_NUMBER
TRASHRACK_ASSOC	TRASHRACK_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
TRASH_LENGTH	TRASH_LENGTH	Double		
TRASH_WIDTH	TRASH_WIDTH	Double		
NUISANCE_LINE_ASSOC	NUISANCE_LINE_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
BUBBLER_BOX_DRYWELL_ASSOC	BUBBLER_BOX_DRYWELL_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
HEADWALLASSOC	HEADWALLASSOC	Text	5	GIS_BOOLEAN_YES_NO
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	50	

STORM_OUTLET				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	25	SWS_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	25	SWS_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	25	SWS_SPATIALSOURCE
GRATE_ASSOC	GRATE_ASSOC	Text	25	GIS_BOOLEAN_YES_NO
GRATE_LENGTH	GRATE_LENGTH	Double		SWS_GRATE_LENGTH
GRATE_WIDTH	GRATE_WIDTH	Double		SWS_GRATE_WIDTH
INLET_PIPE_DIAM	INLET_PIPE_DIAM	Short		SWS_INLET_PIPE_DIAM
INLET_NUMBER	NUMBER_OF_INLETS	Short		SWS_INLET_NUMBER
TRASHRACK_ASSOC	TRASHRACK_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
TRASH_LENGTH	TRASH_LENGTH	Double		
TRASH_WIDTH	TRASH_WIDTH	Double		
NUISANCE_LINE_ASSOC	NUISANCE_LINE_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
BUBBLER_BOX_DRYWELL_ASSOC	BUBBLER_BOX_DRYWELL_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
HEADWALLASSOC	HEADWALLASSOC	Text	5	GIS_BOOLEAN_YES_NO
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	50	

STORM_SCUPPER				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	FEATUREOWNER	Text	25	SWS_FEATUREOWNER
LIFECYCLESTATUS	LIFECYCLESTATUS	Text	25	SWS_LIFECYCLESTATUS
SPATIALSOURCE	SPATIALSOURCE	Text	25	SWS_SPATIALSOURCE
CITY_EMBLEM	CITY_EMBLEM	Text	5	GIS_BOOLEAN_YES_NO
NUMBER_OPENINGS	NUMBER_OPENINGS	Short		
WIDTH	WIDTH	Double		
SPILLWAY_ASSOC	SPILLWAY_ASSOC	Text	25	GIS_BOOLEAN_YES_NO
HEADWALL_ASSOC	HEADWALL_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
NUISANCE_LINE_ASSOC	NUISANCE_LINE_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
BUBBLERBOX_ASSOC	BUBBLERBOX_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
BUBBLER_BOX_DRYWELL_ASSOC	BUBBLER_BOX_DRYWELL_ASSOC	Text	5	GIS_BOOLEAN_YES_NO
LAKE_DRAIN	LAKE_DRAIN	Text	5	GIS_BOOLEAN_YES_NO
RIPRAP	RIPRAP	Text	25	GIS_BOOLEAN_YES_NO
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	50	

Storm Domains:

Domain name	SWS_DW_LOCATION
AIRPORT	AIRPORT
CITYRETENTION	CITY RETENTION
PARK	PARK
PARKING_LOT	PARKING LOT
PRIVATERETENTION	PRIVATE RETENTION
STREET	STREET
WELL_SITE	WELL SITE

Domain name	SWS_GRATE_LENGTH
12	12
24	24
28	28
30	30
36	36
38	38
40	40
50	50
60	60
76	76

Domain name	SWS_CB_LID_TYPE
STEEL	STEEL
CONCRETE	CONCRETE

Domain name	SWS_DW_CHAMBER_TYPE
DOUBLE	DOUBLE
SINGLE	SINGLE
TRIPLE	TRIPLE

Domain name	SWS_LIFECYCLESTATUS
ACTIVE	ACTIVE
REMOVED	REMOVED
ABANDONED	ABANDONED
INACTIVE	INACTIVE
FUTURE	FUTURE

Domain name	SWS_GRATE_OPENINGS
1	1
2	2
3	3
4	4
5	5
6	6

Domain name	SWS_SPATIALSOURCE
APPROVED_PLANS	APPROVED_PLANS
ASBUILT	ASBUILT
DESIGN	DESIGN
FIELD	FIELD
GPS	GPS
ORTHOPHOTO	ORTHOPHOTO
UNKNOWN	UNKNOWN

Domain name	SWS_SDMH_SIZE
22	22
24	24
26	26
28	28
30	30
32	32
38	38

Domain name	SWS_DW_LID_SIZE
22	22
24	24
25	25
26	26
32	32
38	38

Domain name	SWS_STRUCTURE_TYPE
1	CATCH BASIN
2	SCUPPER
3	DRYWELL
4	MANHOLE
5	OUTLET
6	INLET
7	BUBBLERBOX
8	SPILLWAY
9	SEPARATOR

Domain name	SWS_SDMH_LID_TEXT
CHANDLER_SANITATION_SEWER	CHANDLER SANITATION SEWER
CHANDLER_STORM/SEWER	CHANDLER STORM/SEWER
NONE	NONE
OTHER	OTHER
STORM SEWER	STORM SEWER

Domain name	SWS_DW_INSTALLER
McGUCKINDRILLING	McGUCKIN DRILLING
TORRENTRESOURCES	TORRENT RESOURCES
WACODRILLING	WACO DRILLING
OTHER	OTHER

Domain name	SWS_CB_ACCESS_OPENING_TYPE
NONE	NONE
RECTANGULAR	RECTANGULAR
ROUND	ROUND
SQUARE	SQUARE

Domain name	SWS_FEATUREOWNER
ADOT	ADOT
CITY_OF_CHANDLER	CITY_OF_CHANDLER
HOA	HOA
OTHER	OTHER

Domain name	SWS_GRATE_WIDTH
6	6
12	12
16	16
18	18
24	24
28	28
30	30
36	36
38	38
44	44
72	72

Domain name	SWS_SDMH_ACCESS_OPENING_TYPE
NONE	NONE
RECTANGULAR	RECTANGULAR
ROUND	ROUND
SQUARE	SQUARE

Domain name	SWS_FIELD_LOC
PARK	PARK
WELLSI	WELL_SITE
PRKLOT	PARKING_LOT
STREET	STREET
AIRPOR	AIRPORT
CTYRTN	CITYRETENTION
PVRET	PRIVATERETENTION

Domain name	SWS_SDMH_TYPE
PRESSURIZED	PRESSURIZED
NON-PRESSURIZED	NON-PRESSURIZED

Domain name	SWS_DW_LID_TYPE
STEEL	STEEL
GRANITE	GRANITE
CONCRETE_SEALED	CONCRETE_SEALED
GRATE	GRATE

Domain name	SWS_INLET_PIPE_DIAM
12	12
13	13
14	14
15	15
16	16
18	18
24	24
26	26
30	30
36	36
42	42
46	46
60	60
72	72

Domain name	SWS_INLET_NUMBER
1	1
2	2
3	3
4	4

Domain name	SWS_CB_TYPE
TYPE_A	TYPE_A
TYPE_B	TYPE_B
TYPE_C	TYPE_C
TYPE_D	TYPE_D
TYPE_E	TYPE_E
TYPE_F	TYPE_F
TYPE_G	TYPE_G
TYPE_H	TYPE_H
TYPE_Q	TYPE_Q
NONE	NONE

Domain name	SWS_LID_GRATE
LID	LID
GRATE	GRATE

Domain name	SWS_CV_PIPE_TYPE
CONCRETE	CONCRETE
OTHER	OTHER
METAL	METAL

Domain name	SWS_CV_PIPE_SIZE
12	12
14	14
16	16
18	18
20	20
24	24
30	30
36	36

DATA DICTIONARY: MISCELLANEOUS POINTS

MISCELLANEOUS POINT				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
SIZE	SIZE	Double		
MATERIAL	MATERIAL	Text	30	
UTILITY_TYPE	UTILITY_TYPE	Text	30	PW_UTILITY_TYPE
NOTES	NOTES	Text	150	
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	50	

Domains:

Domain name	PW_UTILITY_TYPE
WATER	WATER
WASTEWATER	WASTEWATER
RECLAIM	RECLAIM
STORM	STORM
OTHER	OTHER

DATA DICTIONARY: STREETLIGHTS

STREETLIGHTS				
Field Name	Alias Name	Type	Length	Domain
OBJECTID	OBJECTID	OID		
SHAPE	SHAPE	Geometry		
FEATUREOWNER	POLE_OWNER	Text	10	ST_STLITINV_FEATUREOWNER
SPATIALSOURCE	SPATIALSOURCE	Text	25	GBA_STATIC_SPATIALSOURCE
POLENUMBER	POLENUMBER	Text	10	
POLE_HEIGHT	POLE_HEIGHT	Short		
POLE_TYPE	POLE_TYPE	Text	30	TE_STLITINV_POLE_TYPE
POLE_COAT	POLE_COAT	Text	30	TE_STLITINV_POLE_COAT
FOUNDATION	FOUNDATION	Text	30	GIS_BOOLEAN_YES_NO
GPS_DATE	GPS_DATE	Date		
GPS_TIME	GPS_TIME	Text	10	
LATITUDE	LATITUDE	Double		
LONGITUDE	LONGITUDE	Double		
ALTITUDE	ALTITUDE	Double		
HORIZONTAL_ACCURACY	HORIZONTAL_ACCURACY (m)	Double		
VERTICAL_ACCURACY	VERTICAL_ACCURACY (m)	Double		
GPS_COMMENT	GPS_COMMENT	Text	255	

Streetlights Domains:

Domain name	ST_STLITINV_FEATUREOWNER
COC	CITY OF CHANDLER
PRIVATE	PRIVATE
SRP	SRP
AP	APS

Domain name	GBA_STATIC_SPATIALSOURCE
GPS	GPS
ORTHOPHOTO	ORTHOPHOTO
APPROVED_PLANS	APPROVED_PLANS
GEOCODED	GEOCODED
UNKNOWN	UNKNOWN

Domain name	TE_STLITINV_POLE_TYPE
SL 1	SL 1
SL 6	SL 6
SL 8	SL 8
SL 10	SL 10
SL 16	SL 16
SL 17	SL 17
CURVED	CURVED
CUSTOM	CUSTOM
STERNBERG	STERNBERG
SIGNAL POLE	SIGNAL POLE
POWER POLE	POWER POLE

Domain name	TE_STLITINV_POLE_COAT
GALVANIZED	GALVANIZED
PAINTED	PAINTED
POWDER COATED	POWDER COATED

EXHIBIT E

FEDERAL PROVISIONS

N/A