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CITY OF CHANDLER, ARIZONA

DR. A.J. CHANDLER PARK RENOVATION PHASE 1
CITY PROJECT NO.: CA2402.401

CONSTRUCTION SERVICES AGREEMENT

(CONSTRUCTION MANAGER AT RISK)

Daniel Haskins

Daniel Haskins, P.E.
CIP City Engineer

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CITY OF CHANDLER, ARIZONA

DR. A.J. CHANDLER PARK RENOVATION PHASE 1
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CONSTRUCTION MANAGER AT RISK
CONSTRUCTION SERVICES AGREEMENT
PROJECT NO.: CA2402.401

This Agreement (the "AGREEMENT") is made and entered into on the _____day of _____, 2025, ("Effective Date") by and between City of Chandler, an Arizona municipal corporation, hereinafter called "City" and Willmeng Construction, Inc. the "Construction Manager at Risk" or "CM@Risk" designated below (City and CM@Risk may individually be referred to as "Party" and collectively referred to as "Parties").

City and CM@Risk 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: Scott Riter**
Public Works & Utilities Department
P.O. Box 4008, Mail Stop 407 Chandler, AZ 85244-4008
Phone: 480-782-3328 Email: Scott.Riter@chandleraz.gov

CM@RISK:

Legal Company Name:	Willmeng Construction, Inc.
Mailing Address:	1702 East Highland Avenue, Suite 450 Phoenix, AZ 85016
Physical Address:	1702 East Highland Avenue, Suite 450 Phoenix, AZ 85016
Arizona Roc No.:	082904
Federal Tax Id No.:	86-0410806
State Where Organized:	Arizona
Business Organization:	Corporation
Statutory Agent Name:	Brian Flaherty
Statutory Agent Mailing Address:	1702 East Highland Avenue, Suite 450 Phoenix, AZ 85016
Statutory Agent Physical Address:	1702 East Highland Avenue, Suite 450 Phoenix, AZ 85016

CM@Risk's Authorized Project Representative:

Name:	Michael Mongelli
Title:	President
Phone:	480-968-4755
Email:	mmongelli@willmeng.com

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PROJECT DESCRIPTION:

The project scope of work consists of the demolition of existing pavements, water features and structures, and construction of new decorative hardscape plazas, relocated and new public art, shade tree infrastructure including below-ground soil improvements, event lawns, seasonal plazas with social activities, seating and site furniture, park lighting, power infrastructure, two large shade canopies, storage rooms, two new restroom buildings, two park pavilions, and a new HAWK signal at the existing Arizona Avenue pedestrian crossing.

PROJECT LOCATION:

3 South Arizona Avenue, Chandler, AZ 85224

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ARTICLE 2 - AGREEMENT DOCUMENTS

2.1 AGREEMENT DOCUMENTS

The Agreement between City and CM@Risk 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. Accepted GMP/Price Proposal as set forth in **Exhibit D**, incorporated by reference.

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 Sections 2 and 15 of the General Conditions apply to all the Agreement Documents, including this Agreement.

ARTICLE 3 - PRE-CONSTRUCTION SERVICES

Although CM@Risk has performed Pre-Construction Services pursuant to a separate Agreement between City and CM@Risk, the completion, quality and accuracy of those services and the deliverables provided by City thereunder directly impact CM@Risk's performance of its obligations under this Agreement. Therefore, all of CM@Risk's obligations, duties, and warranties in relation to Pre-Construction Services and deliverables survive completion of the Pre-Construction Services Agreement and are incorporated herein. Any breach of any of CM@Risk's duties, obligations, or warranties under the Pre-Construction Services Agreement will likewise be considered a breach of this Agreement.

ARTICLE 4 - CONSTRUCTION SERVICES

4.1 GENERAL

4.1.1 CM@Risk agrees at its own cost and expense, to do all work necessary and 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, and within the schedule, stated in attached **Exhibit A**.

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4.1.2 CM@Risk 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.

4.1.3 This is an Agreement for complete construction services in accordance with the Construction Manager at Risk method of delivery of construction services. CM@RISK has participated in the design process and been an active member of the Project Design Team and is fully aware of any issues and constraints involved in this Construction Project.

4.1.4 CM@RISK is the CITY's fiduciary responsible for undertaking all necessary action contemplated under the Agreement documents to construct the Project and ensure timely and quality completion of the Project at a cost within the Guaranteed Maximum Price (GMP).

4.1.5 At all times relevant to this Agreement and performance of the Work, the CM@Risk 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**.

4.1.6 CM@Risk must perform the Work under this Agreement using only those firms, team members and individuals designated by CM@Risk consistent with the Statement of Qualifications dated March 6, 2025, the GMP Proposal, or otherwise approved by City pursuant to the General Conditions. No other entities or individuals may be used without prior approval of the Project Manager

4.1.7 CM@Risk will comply with all terms and conditions of the General Conditions.

4.1.8 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.

4.1.9 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, CM@Risk hereby transfers and assigns ownership of the copyright in such Work to City. The rights in this Section are exclusive to City in perpetuity.

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4.2 **CM@RISK'S PRE-AGREEMENT AND PRE-WORK DELIVERABLES**

4.2.1 The CM@Risk must provide the Deliverables in accordance with Section 4.2 of the General Conditions.

4.3 **PRE-CONSTRUCTION CONFERENCE**

Refer to Section 4.3 of the General Conditions.

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

Refer to Section 4.4 of the General Conditions.

4.5 **CONTROL OF THE PROJECT SITE**

Refer to Section 4.5 of the General Conditions.

4.6 **PROJECT SAFETY**

Refer to Section 4.6 of the General Conditions.

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

Refer to Section 4.7 of the General Conditions.

4.8 **PROJECT RECORD DOCUMENTS**

Refer to Section 4.8 of the General Conditions.

4.9 **WARRANTY AND CORRECTION OF DEFECTIVE WORK**

Refer to Section 4.9 of the General Conditions.

ARTICLE 5 - CITY RESPONSIBILITIES

5.1 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 6 - AGREEMENT TIME

6.1 **GENERAL**

6.1.1 The Agreement Duration is 455 Calendar Days.

6.1.2 The Agreement Time will start with the Notice to Proceed (NTP) and end with Final Acceptance, as set forth in Article 6.4 below. The Notice to Proceed cannot be issued until approval and acceptance by City of the GMP or Fixed Price.

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

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

6.2 PROJECT SCHEDULE

6.2.1 The Project Schedule approved as part of the GMP Proposal and incorporated herein as part of the attached **Exhibit D** must be updated and maintained throughout CM@Risk's performance under this Agreement in accordance with Section 6.2 of the General Conditions.

6.2.2 Failure on the part of CM@Risk to adhere to the approved Project Schedule will be deemed a material breach and sufficient grounds for termination of this Agreement by City.

6.3 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.

6.4 FINAL ACCEPTANCE

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

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

6.5 LIQUIDATED DAMAGES

6.5.1 Substantial Completion Liquidated Damages. CM@Risk acknowledges and agrees that if CM@Risk 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 CM@Risk agree that if CM@Risk fails to achieve Substantial Completion of the Work within the Agreement Time, City will be entitled to retain or recover from CM@Risk, as liquidated damages and not as a penalty, the sum per calendar day as indicated in MAG § 108.9.

6.5.2 Final Acceptance Liquidated Damages. For the same reasons set forth in Article 6.5.1 above, City and CM@Risk further agree that if CM@Risk fails to achieve Final Acceptance of the Work within the Agreement Time, City will be entitled to retain or recover from

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CM@Risk, 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.

6.5.3 MAG Liquidated Damages. If no liquidated damages are specified in Articles 6.5.1 or 6.5.2 above, then the liquidated damages provisions in MAG § 108.9 will apply.

6.5.4 City may deduct liquidated damages described in this Article 6.5 from any unpaid amounts then or thereafter due CM@Risk under this Agreement. Any liquidated damages not so deducted from any unpaid amounts due CM@Risk 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 CM@Risk.

6.6 **MUTUAL WAIVER OF CONSEQUENTIAL DAMAGES ONLY**

6.6.1 CM@Risk and City waive claims against each other for consequential damages arising out of or relating to this Agreement. This mutual waiver includes:

6.6.1.1 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

6.6.1.2 Damages incurred by CM@Risk 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.

6.6.2 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 6.6 will be deemed to preclude an award of liquidated damages, when applicable, in accordance with Article 6.5 above.

6.6.3 Nothing herein will be deemed to constitute a waiver of any other remedy available to City in the event of CM@Risk'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 CM@Risk, the cost and expense of which will be offset against any monies then or thereafter due to CM@Risk (if any) and otherwise immediately reimbursed to City by CM@Risk.

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AGREEMENT PRICE

6.7 AGREEMENT PRICE

6.7.1 In exchange for CM@Risk'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 CM@Risk the "Agreement Price," which:

The sum of the CM@Risk's Fee and reimbursable Cost of the Work, as defined in Section 15 of the General Conditions, which the CM@Risk guarantees will not exceed the GMP set forth in **Exhibit D** in the amount of $17,980,956.36. Costs which would cause the GMP to be exceeded must be paid by CM@Risk without reimbursement from City.

6.7.2 The Agreement Price is all-inclusive and specifically includes all fees, cost, insurance and bond premiums, allowances, construction contingency, owner's contingency, and taxes of any type necessary to fully, properly and timely perform and construct Work.

6.8 CHANGES TO AGREEMENT PRICE

Shall be determined under Section 9 of the General Conditions.

ARTICLE 7 - FORCED LABOR OF ETHNIC UYGHURS PROHIBITED

7.1 **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

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

"CITY" CITY OF CHANDLER

MAYOR

RECOMMENDED BY:

Daniel Haskins November 20, 2025

Daniel Haskins, P.E.
CIP City Engineer

APPROVED AS TO FORM:

City Attorney

ATTEST:

City Clerk Seal

"CM@Risk"
WILLMENG CONSTRUCTION, INC.

Michael Mongelli November 20, 2025

Signature Date

Michael Mongelli

Print Name

President

Title

mmongelli@willmeng.com

Signer Email Address

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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.

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

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Scope of Work (Clarifications, Assumptions & Exclusions)

1. **Scope of Work:** This construction GMP has been developed to complete the Improvements per the AJ Chandler Park 90% Permit Set – September 12, 2025 plans. However, there is approximately $1,535,000 in City accepted value engineering (VE) scope deductions that is not reflected in the 90% plans. All accepted VE scopes will be accounted for in the 100% plans by the design team. The list of accepted VE scope reduction items is budgetary and is listed as following:

Deduct Alternates (Included Above)	Loaded Cost
Omit all tree spading. Includes tree demo ILO spade.	(56,020)
Omit 60" Box Tree	(15,182)
Reduce tree barriers from 161 to 60.	(35,660)
Change all 10 gal shrubs to 5 gal shrubs.	(58,845)
Omit scuppers and trench drains at northeast.	(19,207)
Area drain/catch basin in lieu of radius ACO drain at turf steps	Excluded
Reduce 25% of AESS scope. Pending design clarification	(33,958)
Omit all Swale Bridges. Add sidewalks and culverts.	(186,656)
Remove 6" ABC below Vehicular Concrete at Pavers (1-12)	(31,188)
Change (48) Euculiptis trees from 36" box to 24" box	(37,284)
Site Concrete Reduction	(23,538)
Delete Waterproofing at Buildings and Site Walls	(59,604)
Site Furnishings Omit Tree Planters and Pots (5-25, 5-26, & 5-27)	(57,962)
Delete (2) Drinking Fountains	(28,246)
Metal Panel Patern - 25% Open	Excluded
Lighting Reduction - Replace EG1 with EG3 Bollards & Delete 28 EG4 Lights	(150,938)
Wood T&G In Lieu of Metal Panel at E/W Canopy - Includes Solid Panels at Gable Ends and Added Support Framing/Flashing	(634,603)
Reduce Sub Bonds	(106,275)
	(1,535,166)

2. **Summary of the GMP: Please** See the attached GMP Summary Sheet for a detailed understanding of the scope covered within the GMP.

3. **Schedule of Values:** Please see the attached GMP Summary Sheet. Any quantities & unit prices are for accounting and estimating purposes only and should not be used for direct billing purposes. The total summary dollars for each division of work should be used for billing purposes and serve as the basis for the schedule of values.

4. **List of Plans and Specifications: List of Plans and Specifications:** Willmeng is providing improvements based on the following:
    a. **Plans:** Dr. AJ Chandler Park 90% Drawing Set (09.12.25)
    b. **Geotechnical Report:** Ninyo & Moore Project No. 608597001 – Draft Report and Addendum
    c. **Specifications:**
        1. Dr AJ Chandler Park 90% Arch Specs – Architectural Specifications (09.12.25)
        2. Dr AJ Park 90% Civil Specifications – Civil Specifications (No Date)
        3. Dr AJ Park 90% Landscape Specifications – Landscape Specifications (9.18.25)

5. **List of Clarifications and Assumptions:**
    - **Work Hours:** It is assumed we can work typical 8-hour work days beginning from 5 AM. We may also work 10-hour days if the schedule requires us to do so. If we need to work weekends or during the night, we will apply for the City variance as needed.

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- **Construction Noise:** It is assumed our standard work production will not be restricted by noise restrictions. Overall, we have a substantial amount of work to complete to meet the project deadline and we need to maintain production as much as possible.
- **Phasing:** It is assumed the park will remain closed for the duration of this GMP and the Project. We do understand that the park on the west side of Arizona Ave needs to be ready and open by 12/4/26 with tree set up as early as 11/25/26. The east side will be substantially completed on 3/12/27.
- **Site Access:** It is assumed that we can have multiple ingress/egress points. Access locations will be identified and approved as part of the site Logistics Plan prior to the start of construction.
- **Pedestrians:** It is assumed pedestrians will not have access to the park during this GMP or the overall Project with the exception that Willmeng must maintain access to all businesses and stakeholders.
- **Events:** It is assumed no events will occur within the project limits during this GMP or the overall Project. We do understand that the park on the west side of Arizona Ave needs to be ready and open by 12/4/26 with tree set up as early as 11/25/26. The east side will be substantially completed on 3/12/27.
- **3rd Party Electrical/Communication Design:** It is assumed that any third party electrical or communications-based design/installations by others will be completed within our construction sequencing time frame. If this scope by others impacts our project schedule, we assume we will be provided with a respective time extension if a logical solution cannot be achieved.
- **Permitting and Inspections:** It is assumed that all scope within this GMP will not be restricted or impacted by a lack of permitting or the ability for the City to provide inspections. If our work was impacted by either of these, we would require a respective time extension if a logical solution cannot be achieved. Also, it is assumed that permits will be granted for potential phased opening of the new park improvements.
- **General:** If any scope is reasonably not included in this GMP (due to nature of 90% plans), it is assumed the respective scope dollars could be added to the contract at the 100% reconciliation stage.
- **Cost Management:** This GMP is established based on the 90% plans. All scopes could change as the 100% plans are developed. Upon receiving the 100% plans and identifying the changes, respective scopes of work will be repriced as applicable. These changes (increases or decreases in cost) will be managed by the Design Contingency, Contractors Contingency, or Owner's Contingency (dependent upon the change). New scopes of work as agreed upon between Willmeng and the City will be managed through contingencies depending upon the change and overall standing of the GMP.
- **Cost Management:** Due to the nature of this project (Early Procurement GMP based on 90% plans and not on the final plans), CMAR can utilize project savings to manage scope variations between pay items and from the 90% plans to the Final 100% Permitted Plan Set stage without approval from the City. However, CMAR must keep the City reasonably informed of this cost management in a manner acceptable by the City.
- **Cost Management:** There could be material price changes from the time subcontractors provide pricing to when subcontracts can be executed. If applicable, these changes (increases in cost) will be managed by the project savings and Contractors Contingency as necessary.
- **Cost Management Related to Accepted VE List:** A total of 18 VE items have been accepted, representing approximately $1,535,000 in anticipated savings. While several items reflect firm

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pricing, many are budgetary and depend on design revisions at the 100% construction documents stage. As the design is finalized, the actual value of certain VE items may vary, either increasing or decreasing, based on the final scope and detailing.

- **Supply Chain:** Manufacturer or Supplier delays in manufacturing, shipping or delivery of critical equipment, parts, supplies, etc. for the project that are out of the direct control of the Contractor shall be considered as acts of Force Majeure. These delays will be considered "uncontrollable delays" and will extend critical path completion dates, substantial completion dates and project final completion dates accordingly in accordance with the Contract without negative impact on the Contractor for such uncontrollable delays.
- **Water, Sewer & Storm drain:** It is assumed there are no issues/repairs needed with the existing Water, Sewer & Storm Drain systems that this project is connected to.
- **Traffic Control Moratorium:** It is assumed this project will not be restricted by the City's traffic control moratoriums. In general, we have minor roadway utility tie-ins that will be short durations.
- **Site Logistics:** It is assumed that existing utilities and waterways will not impede access to construction activities.
- **SRP Irrigation:** It is assumed that Willmeng will be permitted to cross over the existing SRP irrigation line with standard construction equipment without the need for additional protection measures provided by Willmeng. Willmeng will also be allowed to install new utilities beneath the existing SRP irrigation line as shown in the 90% design documents. The existing condition of the SRP irrigation pipe is unknown; therefore, Willmeng shall not be responsible for any pre-existing damage or deterioration of the line, nor for damage resulting from typical and prudent construction activities, including standard equipment and material crossings.
- **Existing Street Lights:** It is assumed all existing streetlights are powered from the park's current electrical equipment. Willmeng is assuming these streetlights can be powered off during construction, or the City can temporarily energize these street lights while the existing electrical equipment is relocated, per the 90% drawing set.
- **Construction Schedule and Duration:** Construction is scheduled to start on 1/12/2026 and will be substantially completed on 3/12/2027. We do understand that the park on the west side of Arizona Ave needs to be ready and open by 12/4/26 with tree set up as early as 11/25/26. The East side will be substantially completed on 3/12/27.
- **Mockup Allowance:** The mockup allowance is contingent upon receipt of the mockup drawing requirements from the Architect. Once the mockup scope, size, and level of finish are defined through the Architect's drawings, Willmeng will confirm the associated allowance. Also, mockups will be used to confirm installation but is NOT a confirmation on materials.
- **General Conditions:** General Conditions costs are based on a 14-month construction duration and shall be prorated accordingly for monthly billing purposes throughout the construction period.
- **Demo:** Assumed that COC will have all storage rooms and restrooms empty prior to demo.

List of Exclusions:

- **Environmental:** It is assumed there are no environmental ore archaeological concerns on the project that could impact on the project's budget or schedule. Discovery, inspection, surveys,

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abatement or removal of any hazardous material or environmental artifacts, including, but not limited to Lead, Asbestos, Mold, PCB, Radon or Petroleum Hydrocarbon or any other such types of materials or conditions are excluded.

- **Permits & Fees:** All Permits, Plan Review Fees, Building/Site/Offsite Permit Fees, Development Fees, Water Tap & Meter Costs, other such or Special Fees or Bonds - unless specifically listed as included & outlined in this GMP are excluded.
- **Special Inspections:** Structural, Plumbing, Mechanical, Electrical or Others are excluded.
- **Schedule:** Excludes Cost & Resource Loaded scheduling.
- **General Scope:** Any Costs for scope not shown in the 90% plans or listed in the schedule of values is excluded.
- **Earthwork:** Excludes any removal and haul off of unsuitable material if discovered on project site, as well as any necessary import to remedy unsuitable areas.
- **Private Building Landscaping:** It is assumed that the landscaping for all adjacent private buildings that border the project are on independent landscape systems. The cost to maintain these systems or general landscaping is excluded.
- **Fees:** Except deposit for Hydrant Meter, construction water and construction trailer use, all third-party utility fees, deposits, design fees, or general utility work not completed by Willmeng or its subcontractors is excluded.
- **Existing Utilities:** Removal of existing utilities not shown on the plans is excluded. Abandonment in place via slurry injection is excluded.
- **Existing Utilities:** Relocation of existing utilities not shown on the plans is excluded. Willmeng not responsible for delays associated with existing utility removal/relocation design, permitting, etc.
- **Existing Utilities:** Excluded repair/replacement for any existing utilities.
- **Off-Duty Officers:** Off-Duty Officers are excluded from this GMP.
- **APS Consolidation:** Excludes custom-made electrical gear/cabinets to consolidate APS Equipment.
- **Subcontractor Bond:** Excludes all bonds for subcontractors with exception to the Structural and Miscellaneous Steel, Decorative Metals, and Electrical scopes. Willmeng will work with the City to determine if a specific trade or scope should require a Bond. Should any subcontractor/trade bonds be required, this will be an added cost to the project that will be captured as part of GMP reconciliation to the final Design.
- **Communication & WAPs:** Excludes all costs associated with communication/fiber installation including but not limited to temporary communication (fiber, antenna or radio) until the City installs permanent communication to the site, Wireless Access Points (WAPs), switches, etc.
- **Signage & Graphics:** Excludes graphics/signage at the restroom building and storage buildings. It is understood that the signage and graphics will be procured by the City of Chandler. ADA and Code Signage is included.
- **Landscaping:** Existing tree salvage, spading, and boxing are excluded.
- **AESS Requirements**: Excluded at hidden/non-visible locations and non-structural steel.
- **Low Voltage**: Access Control and Low Voltage scopes are excluded.
- **Pedestrian Access**: Excludes temporary pedestrian street crossing traffic control at HAWK crossing location (Arizona Ave) during construction.

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- **Landscape Pavers**: Excludes new paver purchase at existing driveways and parking stalls. Assume reuse of existing material and the City to provide paver attic stock as needed.
- **Artwork:** Excludes salvage of any artwork not specifically called out in the 90% drawing set as salvage.
- **Existing Equipment/Furnishings:** All equipment/furnishings to be salvaged by City of Chandler to be complete prior to start of construction. Any items remaining at start of construction shall be deemed as waste.
- **Entry Signage Monuments:** Entry Signage Monuments are excluded from this GMP
- **Splash Pad:** The splashpad is excluded from this GMP.
- **ABC:** Excludes 6” ABC below vehicular pavers (1-12)

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EXHIBIT B

GENERAL CONDITIONS

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CHANDLER arizona
Community of Innovation

GENERAL CONDITIONS

Approved date: July 20, 2022

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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

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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

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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

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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

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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

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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

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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

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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 of 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

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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

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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.

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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, underpinnings, 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

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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 time-table 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

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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,

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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,

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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.

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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

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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, tec. 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

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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

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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

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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

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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.

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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.

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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,

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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

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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

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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

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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.

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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;

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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.

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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'

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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.

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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

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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

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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 "lndemnitor") must indemnify, save, and hold harmless the City and its officers, officials, agents, and employees (collectively "lndemnitee") 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 lndemnitee from and against any and all Claims, except those arising solely from lndemnitee'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 lndemnitee 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

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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.

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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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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**

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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

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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.

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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

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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.

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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 form 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

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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

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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

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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 or 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

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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

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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

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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 not award future Job Orders or Option periods based on performance will be at the sole discretion of City.

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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.

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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

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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

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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.

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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:

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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

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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

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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 form 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

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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

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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.

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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

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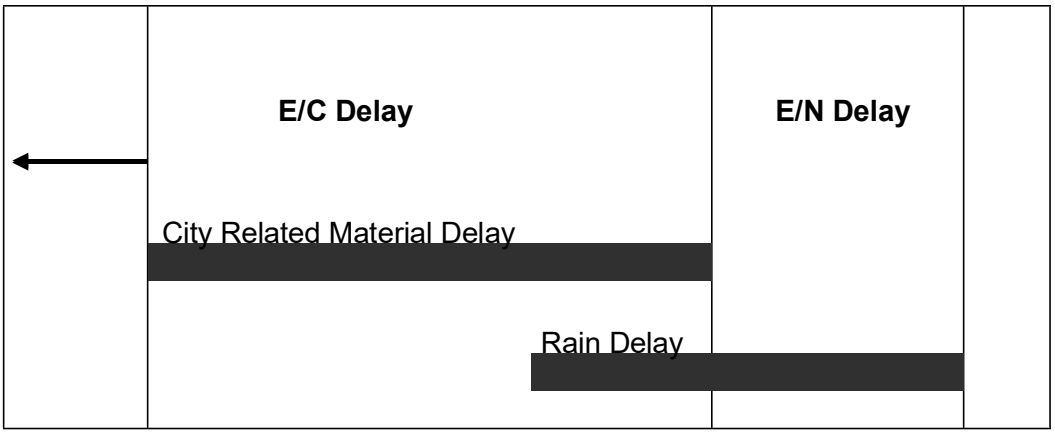
used when there are multiple concurrent delays. Only those extending the Project Completion Date are considered to be delays for the purposes of this policy. The portion of each concurrent delay that delays the completion of the work is classified in the same manner as described previously for individual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

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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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COST REDUCTION INCENTIVE PROPOSAL FORM

TO: **CIP City Engineer**

FROM:

PROJECT NAME: **DR. AJ CHANDLER PARK PHASE 1**

CITY PROJECT NUMBER: **CA2402.401**

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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CITY OF CHANDLER, ARIZONA
PUBLIC WORKS & UTILITIES DEPARTMENT

CONTRACTOR'S AFFIDAVIT REGARDING SETTLEMENT OF CLAIMS

_____, Arizona
Date _____

Project Name: Dr. AJ Chandler Park Phase 1
City Project No.: CA2402.401

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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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 **CA2402.401, Dr. AJ Chandler Park Phase 1** 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__.

_____
PRINCIPAL SEAL

_____
AGENT OF RECORD

By _____

_____
SURETY SEAL

_____
AGENT ADDRESS

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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 **CA2402.401, Dr. AJ Chandler Park Phase 1** 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

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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:	**DR. AJ CHANDLER PARK PHASE 1**		
CITY PROJECT NO.:	**CA2402.401**		
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:

FINAL ACCEPTANCE DATE:	

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:	

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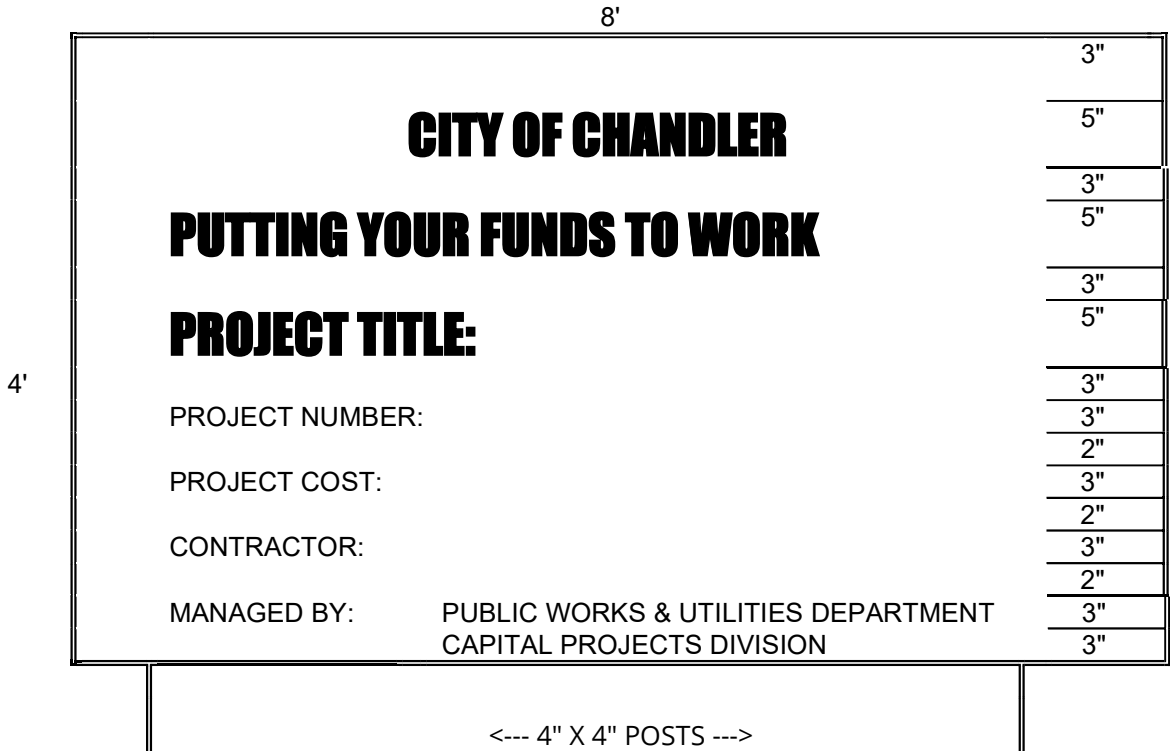
CONSTRUCTION SIGN DETAIL



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.

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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 owning 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.

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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 Granit 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:

Original Size	**Replacement Size**
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:

Existing Plant Material Sizes	**Replacement Size**
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.

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EXHIBIT C

TECHNICAL SPECIFICATIONS

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DOCUMENT 000101 - PROJECT TITLE PAGE

1.1 PROJECT MANUAL VOLUME 90% Set - Not for Construction

A. AJ Chandler Park Improvements.

B. City of Chandler, Arizona.

C. Chandler, Arizona.

D. Owner Project No. CA2402.101.

E. Landscape Architect Project No. 24203.

F. DigStudio .

G. Dig Studio.

H. 3003 N. Central Ave STE 800.

I. Phoenix, Arizona 85012.

J. Phone: 602.595.4101.

K. Web Site: digstudio.com.

L. Issued: <**Insert date**>.

M. Copyright (2025 Dig Studio.) All rights reserved.

END OF DOCUMENT 000101

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DOCUMENT 000107 - SEALS PAGE

1.1 DESIGN PROFESSIONALS OF RECORD

A. Architect:

1. <**Insert name**>.
2. <**Insert license #**>.
3. Responsible for Divisions 01-49 Sections except where indicated as prepared by other design professionals of record.

B. Civil Engineer:

1. <**Insert name**>.
2. <**Insert license #**>.
3. Responsible for <**Insert list of Sections**>.

C. Landscape Architect:

1. **Brandon Sobiech**.
2. **64446**.
3. Responsible for <**Insert list of Sections**>.

D. Structural Engineer:

1. <**Insert name**>.
2. <**Insert license #**>.
3. Responsible for <**Insert list of Sections**>.

E. Fire-Protection Engineer:

1. <**Insert name**>.
2. <**Insert license #**>.
3. Responsible for <**Insert list of Sections**>.

F. Plumbing Engineer:

1. <**Insert name**>.
2. <**Insert license #**>.
3. Responsible for <**Insert list of Sections**>.

G. HVAC Engineer:

1. <**Insert name**>.
2. <**Insert license #**>.
3. Responsible for <**Insert list of Sections**>.

H. Electrical Engineer:

1. <**Insert name**>.

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2. <**Insert license #**>.
3. Responsible for <**Insert list of Sections**>.

END OF DOCUMENT
000107

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SECTION 002200 – SUPPLEMENTARY CONDITIONS

PART 1 - GENERAL

1.1 GENERAL CONDITIONS

A. All Construction under this permit shall conform to the Maricopa Association of Governments Uniform Standard Specification and Details (MAG Specifications and Details).

1.2 SUPPLEMENTS

A. The following supplements modify, change, delete from, and add to, the MAG Specifications. When any portion of the MAG Specifications is modified or any paragraph or subparagraph, or clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of the MAG Specifications shall remain in effect.

Section 105.3

Add the following:

"Execute Work as per Contract Documents. Make no changes without having first received written permission. Where detailed information is lacking, before proceeding with Work, refer matter to PM/CM for information."

"Should conflicts occur in or between drawings and specifications, or within different areas within the plans and/or different areas within the Specifications, the Contractor is deemed to have estimated on the more expensive way unless he has asked for and obtained a written decision from the PM/CM before submission of his proposal as to which method or materials will be required. The construction contract shall ultimately govern in conflicts when they occur between the drawings and specifications."

END OF SECTION 002200

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SECTION 003113 – CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.1 WORK SPECIFIED

A. To assure adequate planning and execution of the Work so that the Work is completed by the date allowed in the Contract, and to assist the City or the City's Representative in appraising the reasonableness of the proposed schedule and in evaluating progress of the Work, prepare and maintain the schedules and reports described in the Section.

B. Contractor should employ a scheduler who is thoroughly trained and experienced in compiling construction schedule data, in analyzing and use of construction scheduling, and in preparation and issue of periodic reports as required below

1.2 RELIANCE UPON APPROVED SCHEDULE

A. The Construction schedule, as reviewed by the City will become an integral part of the Contract, and will establish interim Contract completion dates for the various activities. The ultimate responsibility for timely completion of all contract milestones and completion of the contract shall be that of the Contractor.

B. The Contractor shall develop a baseline schedule which includes activities related to testing, submittals, procurement (long-lead and owner furnished equipment), utility company work, and any other tasks determined to be related to the project's critical path in addition to all the work tasks. The City will determine the acceptance of a final baseline schedule.

C. Should any activity not be complete within 7 calendar days after the stated scheduled date, (approved and accepted construction delays will be taken into consideration) the City shall have the right to order the Contractor to expedite completion of the activity by whatever the City deems appropriate and necessary, without additional compensation to the Contractor.

D. Should any activity be 15 or more calendar days behind schedule, the City shall have the right to direct the activity to be performed by whatever methods the City deems appropriate.

E. Costs incurred by the City in connection with expediting construction activity under this Article shall be reimbursed to the City by the Contractor.

1.3 REPORT FORMATS

A. Construction Diagram: The Schedule of Construction Diagram must be a standard and accepted schedule of activities that shall graphically show the order and interdependence of all activities necessary to complete the Work, and the sequence in which each activity is to be accomplished, as planned by the Contractor and his Project Field Superintendent in coordination with all Subcontractors whose work is shown on the diagram. Activities shown on the diagram shall include, but are not necessarily limited to:

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1. Project Mobilization
2. Submittals and approvals of Shop Drawings and Samples
3. Procurement of equipment and critical materials
4. Fabrication of special material and equipment, installation and testing
5. Final Cleanup
6. Final inspection and testing
7. All activities determined by the City to affect the progress of required dates for completion, for all and for each part of the work

B. The detail of information shall be such that duration times of activities shall normally range from 1 to 25 calendar days. The selection and number of activities shall be subject to City approval.

C. Show on the diagram, as a minimum for each activity, description of each activity, duration in calendar days of each activity, completion of each activity, and how each activity affects each other activity. Submit diagram on a sheet 30” high, or agreed height by the City, by the width required.

D. The Contractor shall additionally provide a Bar Chart type schedule for review at each project meeting. The information shall be detailed by activity and updated weekly to demonstrate work progress for any 2-4-week period. Each activity schedule to be complete during a previous week that is not accomplished shall be explained during the current project meeting with solution for expediting that activity and/or statement relative to the delays to explain the same.

1.4 MATERIAL STATUS REPORTS

A. The Contractor’s standard materials status report form will be acceptable if, in the City’s judgment, it provides sufficient pertinent data to determine that materials procurement flow is adequate for all needs of the Work. The Contractor’s standard materials status report shall include, at a minimum, the following information:
1. Item description, listed in accordance with the Specifications Section number in which the item is called for
2. Purchase Order number and date of issue
3. Vendor Name
4. Date Shipped and shipping means utilized
5. Estimated date of arrival at job site
6. Actual date of arrival at project site, and receiving report number

B. On a letter of transmittal accompanying periodic reports, or an accompanying summary sheet, or other means acceptable to the City, clearly indicate those items which are critically overdue or otherwise detrimental to the maintenance of the approved schedule.

1.5 CONSTRUCTION STATUS REPORTS

A. Report actual progress by updating the mathematical analysis as indicated below.

B. Note on the summary report, or clearly show on a revised issue the affected portions of the detailed diagram, all revisions causing changes in the detailed program.

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C. Revise the summary report as necessary for continued clarity.

D. Describe activities or portions of activities completed during the reporting period.

E. State the percentage of Work actually completed and scheduled as of the report dates and the progress along the critical path in terms of days ahead or days behind the scheduled dates.

F. It the Work is behind schedule, also report progress along other paths with negative float.

G. Include a narrative report which shows but is not necessarily limited to:
   1. A description of the problem areas, current and anticipated
   2. Delaying factors, and their impact
   3. An explanation of corrective actions taken or proposed

1.6 6.01 REVISIONS

A. Make only those revisions to the approved Construction Schedule and approved Material Status Report as they are approved in advance by the City.

END OF SECTION 003113

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SECTION 003351 – EXPOSED AGGREGATE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes: Micro Finished and Exposed Coarse Aggregate Concrete produced through the use of chemical surface retarder to expose the sand and fine aggregates of a concrete mix

B. Related Sections: Refer to the following sections for related work
   1. Section 02200: “Earthwork”
   2. Section 03300: “Cast-In-Place Concrete”
   3. Section 05500: “Metal Fabrications”
   4. Section 07900: “Joint Sealants”

1.2 References

A. American Concrete Institute (ACI)

B. American Society of Testing and materials (ASTM)
   1. C 31 Practices for Making and Curing Concrete Test Specimens in the Field
   2. C 33 Specification for Concrete Aggregates
   3. C 39 Test Method for Compressive Strength of Cylindrical Concrete Specimens
   4. C 42 Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
   5. C 94 Specification for Ready-Mixed Concrete
   6. C 143 Test Method for Slump of Hydraulic Cement Concrete
   7. C 150 Specification for Portland Cement C 172 Practice for Sampling Freshly Mixed Concrete
   8. C 231 Test Method for Sampling Air Content of Freshly Mixed Concrete by Pressure Method
   9. C 260 Specification for Air-Entraining Admixtures for Concrete
   10. C 494 Specification for Chemical Admixtures for Concrete
   11. D 994 Specification for Preformed Expansion Joint Filler for Concrete

1.3 Submittals

A. General: Submit the following items in accordance with the Conditions of Contract and Section 01330, “Submittal Procedures”

B. Product Data: Submit product data for the following materials and items:
   1. Reinforcement
   2. Forming Accessories
   3. Admixtures
   4. Chemical Surface Retarders
   5. Patching Compounds

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6. Sealants
7. Shop Drawings: Submit detailed drawings for fabrication, bending and placement of concrete reinforcement.
8. Show bar schedules, stirrup spacing, diagrams of bent bars and arrangement of reinforcement including bar overlap.
9. Include special reinforcement required for openings through concrete slabs or structures.
10. Laboratory Test Reports: Submit concrete test materials test reports and mix design reports certifying that each material or item complies with or exceeds the specified requirements.

1.4 Quality Assurance

A. Codes and Standards: Comply with provisions of the following, except as otherwise indicated:
1. ACI 301 “Specifications for Structural Concrete for Buildings”
2. ACI 304 “Guide for Measuring, Mixing, Transporting and Placing Concrete”
3. ACI 305 “Hot Weather Concreting “4. ACI 306 “Cold Weather Concreting”
4. ACI 308 “Standard Practice for Curing Concrete”
5. ACI 309 “Standard Practice for Consolidation of Concrete”
6. ACI 318 “Building Code Requirements for Reinforced Concrete”
7. ACI 347 “Recommended Practice for Concrete Formwork”
8. CRSI “Manual of Standard Practice”
9. SP-66 “ACI Detailing Manual”

B. Mock-up Panels: Prepare one mock-up panel at the project site to demonstrate proficiency of the contractor as well as determine the best procedures and degree of sand or aggregate exposure. Mockup panels shall be a minimum of 4’ x 4’. Contractor shall use the methods and materials proposed for use on the final installation. Uniformity in appearance of each panel shall be the responsibility of the contractor. The approved mock-up panel shall serve as a standard of appearance for the final work to be produced. Dayton Superior’s Technical Representative, insert name, whenever possible, shall be present and or involved with the mock up to review proper preparation, application and removal processes.

C. Quality Control Testing During Construction: Contractor will engage independent concrete testing service for quality control during concrete construction operations.
1. Notify owner’s representative at least two (2) working days in advance of field operations requiring concrete testing, or of resumption of operations after stoppages.
2. Coordinate concreting operations with testing service to facilitate quality control testing.
3. Sample and test concrete during placement as follows:
    a. Sampling Fresh Concrete: ASTM C172: except modified for slump to conform with ASTM C94
    b. Slump: ASTM C143; test one for each concrete load at point of discharge and one for each set of compressive strength test specimens.
    c. Air Content ASTM C231: pressure method: one for each set of compressive specimens.
    d. Compressive Strength Tests: ASTM C39; one (1) set for each 150 cubic yards (115 cubic meters) or fractions thereof, of concrete class placed in any one day or for each 5,000 sq. ft. (465 sq. meters) of surface area placed; two (2) specimens tested seven (7) days, three (3) specimens tested twenty-eight (28) days and one (1) specimen retained in reserve for later testing if required.

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4. SCAQMD VOC Compliance: Contractor to submit documents that surface retarder complies with SCAQMD Rule 1113 for VOC compliance in the flats category.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

A. Unless otherwise indicated, construct formwork with plywood metal, metal-framed plywood or other acceptable materials to provide continuous, straight, smooth exposed surfaces.
   1. Provide form material with sufficient thickness to withstand pressure of newly placed concrete without bowing or deflection.
   2. Provide forms that comply with US Product Standard PS 1 when applicable
      a. B-B High Density Overlaid Concrete Form, Class I
      b. B-B (Concrete Form) Plywood Class I, Exterior Grade or better, edge sealed, with each piece bearing legible inspection trademark.
   3. Form Coatings: Provide commercially formulated form-coating compounds that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
      a. Acceptable Materials: Clean Strip™ J100 VOC. www.daytonsuperior.com
   4. Form Ties: where applicable Provide factory-fabricated, adjustable length, removable or snap off metal form ties, designed to prevent deflection and to prevent spalling concrete surfaces upon removal.

2.2 REINFORCING MATERIALS

A. Cold-drawn steel wire. ASTM A82

B. Welded wire fabric: ASTM A185, welded steel wire fabric, furnish in flat sheets, not rolls unless approved by the owner’s representative.

C. Reinforcing Bars: ASTM A615, deformed.
   1. Provide Grade 40 bars as required in details. 2. Provide Grade 60 Bars No.3-18, except as otherwise noted.

D. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place.
   1. Use wire type supports complying with CRSI recommendations, unless otherwise indicated. Do not use wood, brick, stone, broken block or pieces of concrete.
   2. For concrete-on-grade, use supports with sand plates or horizontal runners if base material will not adequately support chair legs.
   3. For exposed – to – view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs, which are protected with plastic, stainless steel protected, or special stainless complying with CRSI Classes, C, D, or E, respectively.

E. Shop fabricate the reinforcing bars to conform to required shapes and dimensions, with fabrication tolerances complying with ACI 315. In case of fabricating errors do not re-bend or straighten reinforcement in manner that will injure or weaken material.

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2.3 CONCRETE MATERIALS

A. Portland Cement: ASTM C150 Types I-II and III, “Low-Alkali” cement unless otherwise specified. Use one brand of cement throughout the project unless otherwise approved by the owner’s representative.

B. Aggregates: Shall be gap- graded conforming to C 33, size to be approved by the owner’s representative dependent upon the type, color and etch of exposure desired.

C. Water: Potable, clean, fresh, free from oils, acids, organic matter or other deleterious substances.

D. Admixtures: All admixtures shall be specified in the mix design.
1. Air-Entraining Admixtures: ASTM C 260
2. Water-Reducing Admixture: ASTM C 494, Type A.
3. Water-Reducing, Retarding Admixture: ASTM C 494, Type D.
4. Chloride-containing Admixtures are not permitted.

2.4 RELATED MATERIALS

A. Expansion Joint Materials
1. Typical Building: ASTM D 994, preformed strips of a bituminous mastic compositions
2. Slabs – in Ground and Sidewalks: ASTM D 1751, preformed expansion joint filler having relatively little extrusion and substantial recovery after release from compression.

B. Follow ACI 308 for concrete curing.

2.5 CONCRETE MIX DESIGN

A. Exposed Coarse Aggregate Finishes, “Ready Mixed “concrete unless otherwise approved or specified; in accordance with ASTM C 94. Exposed Aggregate Concrete should meet or exceed the following criteria.
1. Compressive Strength: Minimum 3,500 psi strength at 28 days
2. Concrete shall be gap-graded with weathered rounded coarse aggregate consisting of not more than 62% - 65% minimum content.
3. Water/Cement Ratio: Not greater than .55 by weight.
4. Slump: Not greater than 4 inches.
5. Air Content: Between 4 ½% - 7 ½%

B. Exposed Sand Finishes: Use Ready Mixed “concrete unless otherwise approved or specified; in accordance with ASTM C94. Expose Sand finishes should meet or exceed the following criteria.
1. Compressive Strength: Minimum 3,500 psi at 28 days
2. Concrete shall be gap-graded with weathered round coarse aggregate consisting of not more than 45%-50% maximum content
3. Water/Cement Ratio: not greater than .55 by weight
4. Slump: not greater than 4 inches
5. Air Content: Between 4 ½% - 7 ½%

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C. Admixtures
   1. Use water-reducing admixtures in all concrete.
   2. Use air-entraining admixture in all exterior exposed concrete.

2.6 PLANT, EQUIPMENT, MACHINES AND TOOLS

A. General: Plant, equipment, machines and tools used in the workplace shall be subject to approval and shall be maintained in a satisfactory working condition at all times.
   1. Provide equipment with capability of producing the required product, meeting or exceeding grade controls, thickness control and smoothness requirements as specified.
   2. Use of equipment shall be discontinued if it produces unsatisfactory results.
   3. Owner's representatives shall have access to the plant and all equipment to ensure proper operation and compliance with the specifications at all times during construction.

2.7 CONCRETE SURFACE RETARDER AND FINISHING AIDS

A. Spray Applied, film forming top surface retarder designed for specific sized aggregates and finish requirements. Color Coded to allow for ease of application and verification of etch level being used as well as even and complete coverage
   1. Acceptable Material: Top Cast Surface Retarders by GCP Applied Technologies.

B. Spray Applied and film forming protective coating for adjacent masonry and concrete surfaces
   1. Acceptable Materials: Top Cast SS 100 by GCP Applied Technologies.
      a. Top Cast Surface Retarders and Top Cast SS-100 distributed by Dayton Superior Corporation. 1125 Byers Road Miamisburg, OH 45342 Dayton Superior Customer Service: 888-977-9600 www.daytonsuperior.com/products/chemicals?name=top-cast

PART 3 - EXECUTION

3.1 FORM SETTING

A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure.

B. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.

C. Design formwork to be readily removable without impact, shock or damage to cast - place – concrete surface and adjacent materials.

D. Provisions for other trades: Provide openings in concrete formwork and slabs to accommodate other trades.

E. Tolerances: set forms with the upper edge true to line and grade with an allowable tolerance of ¼" (6mm) in any 10 foot (3 m) long section.

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3.2 PLACING REINFORCEMENT

A. Comply with CRSI's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports.

B. Clean reinforcement of all loose rust and mill scale, earth, ice, oil, concrete splatter from previous pours and other materials, which reduce or destroy bond with concrete.

C. Accurately position, support and secure reinforcement against displacement by formwork, construction or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.

D. Install welded wire fabric of same gage in as long of lengths as is practical. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps of adjacent widths to prevent continuous laps in either direction.

3.3 PREPERATIONS FOR PLACING CONCRETE

A. Remove water from excavations. Before placement, remove wood chips, shavings, and hardened concrete etc. from forms.
   1. Clean all equipment.
   2. Wet forms, except in freezing weather, or oil properly with approved release.

B. Earth shall be uniformly moist when concrete is placed. Sprinkling method shall not be such as to form mud or pools of water. Watering sub-grade immediately prior to concrete placement is not sufficient to make the soil uniformly moist.

C. Notify other trades to permit installation of their work. Coordinate installation of joint materials and moisture barriers with placement of forms and reinforcing steel.

3.4 PLACING CONCRETE

A. Notify owner's representative 24 hours in advance prior to placement.

B. Filed Inspection: Do not place concrete until forms and reinforcing steel have been inspected and approved.
   1. Place Ready-Mix concrete within specified time after batching. a. Below 40 degrees F (4 degrees C) See Cold Weather Placing b. 40 – 85 degrees F (4-29 degrees C) 90 minutes c. 86 – 90 degrees F (30-32 degrees C) 75 minutes d. Above 90 degrees F (32 degrees C) 60 minutes.
      **Concrete exceeding delivery times may be rejected by the owner's representative*
   2. Adding Water: Do not add water after initial introduction of mixing water for batch except when slump of concrete is less than specified upon jobsite arrival and the maximum water/cement ratio has not been exceeded.
      a. Notify owner's representative prior to adding any additional water.
      b. Add only water enough to bring concrete slump within the specified limits. Turn drum at least 30 additional revolutions at maximum mixing speed. Do not add water to batch at any later time.

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c. Insure that concrete strength meets or exceeds specified requirements, and water does not exceed maximum amount specified in the approved CONCRETE MIX DESIGN.

C. General: Comply with ACI 304, as specified herein.
1. Place concrete continuously or in layers of such thickness that the concrete will not be placed on a preceding layer which has hardened sufficiently to cause formation of seams or planes of weakness.
2. If section cannot be placed continuously, provide construction joints. Deposit concrete as nearly as practicable to its final location to avoid segregation.

D. Placing Concrete in Forms:
1. Consolidate placed concrete by high frequency mechanical vibrating equipment, supplemented as necessary by hand spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
a. Do not use vibrators to transport concrete inside forms.
b. Insert and withdraw vibrators vertically at uniformly spaced locations not further visible effectiveness of the machines being used. Generally, 16-20” apart.
c. At each insertion, limit duration of vibration time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

E. Placing Concrete Slabs: Deposit and consolidate concrete slabs in continuous operation, within the limits of construction joints, until placement of panel or section is completed. Maintain reinforcing in proper position during concrete placement operations.

F. Placing Concrete Sidewalks: Place concrete in forms in one (1) layer of such thickness that when consolidated and finished, sidewalks will be of thickness indicated.

G. Cold Weather Placing: Protect concrete work from physical damage or reduced strength caused by frost, freezing actions, or low temperatures, comply with ACI 306.

H. Hot Weather Placing: When hot weather conditions exist that would seriously impair the quality and strength of concrete place concrete in accordance with ACI 305 and as herein specified.

3.5 CONCRETE FINISHING

A. Exposed Coarse Aggregate finishes: Do not use tools that may force the aggregate away from the surface creating a non-uniform surface after exposure
1. Protect all areas, aluminum trim, curbs, borders and adjacent concrete and masonry surfaces, pavers, stones etc. that are not to receive retarder finish prior to concrete placement and retarder application using GCP Applied Technologies Top Cast SS 100 Surface Protectant. Distributed by Dayton Superior.
2. Place concrete in the manner prescribed previously. Screed or strike off the surface in two (2) directions using a wooden or metal straight edge to achieve the proper elevation in a sawing motion back and forth.
3. Allow the bleed water to evaporate the surface. It can then be floated using a wooden hand float or a bull-float preferably wooden to close the surface and surround the coarse aggregate with cement paste. Do not overwork the surface, as this tends to drive the aggregate down away from the surface to be exposed. Float to a uniform appearance.

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4. To reduce the rate of evaporation of moisture from the concrete use AquaFilm® J74RTU during the finishing process, his reduction of moisture loss allows time for proper finishing.

B. Exposed Sand Finishes: The use of a rolling tamper, jitterbug or rolling jitterbug shall be considered when producing micro etched concrete surfaces. This will enable the finisher to create a denser surface paste with no obstruction due to the appearance of coarse aggregate, allowing for a uniform sand texture.
1. Protect all areas, aluminum trim, curbs, borders and adjacent concrete and masonry surfaces, pavers, stones etc. that are not to receive retarder finish prior to concrete placement and retarder application using GCP Applied Technologies Top Cast SS 100 Surface Protectant. Distributed by Dayton Superior.
2. Place concrete in the manner prescribed previously. Screed or strike off the surface in two (2) directions using a wooden or metal straight edge to achieve the proper elevation in a sawing motion back and forth.
3. Allow the bleed water to evaporate the surface. It can then be floated using a wooden hand float or a bull-float preferably wooden to close the surface and surround the coarse aggregate with cement paste. Float to a uniform appearance. Follow float operations with hand trowels or Fresno steel trowels to create tight dense smooth surface. (This may require two or three passes depending upon mix design and or desired finish to be achieved).
4. To reduce the rate of evaporation of moisture from the concrete use AquaFilm® J74RTU during the finishing process, his reduction of moisture loss allows time for proper finishing.
   NOTE: Do not burnish the surface or allow the micro etched surface to prematurely dry prior to the application of Top Cast.

C. Concrete Surface Retarders Spray Applied, film forming top surface retarder, designed for specific sized aggregates and finish requirements. Color coded to allow for ease of application and verification of grade being used as well as even and complete coverage.
1. Soon after the final seal finish has been completed spray GCP Applied Technologies “Top Cast” surface retarder using a lowpressure sprayer with a 0.5gpm tip at a rate of 200—350 sq./ft. per gallon in a full hiding coat.
   a. Once dry GCP Applied Technologies “Top Cast “will yield a coating that provides intermittent rain protection. Once completely dry it can be covered to protect the surface if heavy extended rains are predicted.

Retarder Selection Guide

Number	Aggregate Size to Expose	Color
01	Light Acid Etch Finish	White
03	Acid Etch Finish	Violet
05	Sand Texture Finish	Lt. Blue
15	Up to 1/4” Agg.	Yellow
25	1/8” to 1/4” Agg.	Beige
50	1/8” to 3/8” Agg.	Canary Green
75	1/4" to 3/8” Agg.	Blue
100	3/8” to 1/2" Agg.	Gray
125	3/8” to 5/8” Agg.	Pink
150	3/8” to 5/8” Agg.	Green
200	5/8” to 1” Agg.	Salmon
250	1” to 1-1/2” Agg.	Lt. Orange

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2. Wash surface with water rinse using stiff brooms and water hose or by high pressure washing with power equipment as early as 4-16 depending on weather conditions. Retarder removal intervals are dependent upon strength of the concrete mix, aggregate size and desired washing techniques. Earlier washing on the light etches may be necessary. Verify in accordance with the mock-up approval detailed herein.
3. Rinse water and cement matrix removal shall be in accordance with local codes and should not be allowed to be washed or flow down to arroyos, storm sewers, ponds, streams or sanitary sewers by precipitation or other surface flows.
4. Prior to completion of the project, remove wash water residue from the site to location approved by the local district.

3.6 CONCRETE SURFACE REPAIRS

A. Patching Defective Areas: Immediately cut out honeycomb, rock pockets and voids over ¼ inch (6mm) in any dimension as well as holes left by tie rods, bolts etc. down to solid concrete but, in no case to a depth less than 1 inch (25mm).
   1. Cut edges perpendicular to concrete surface.
   2. Thoroughly clean, dampen with water, and brush coat area to be patched with neat cement grout or proprietary bonding agent before placing cement mortar or proprietary patching compound.

B. Remove and replace concrete with defective surfaces if defects cannot be repaired to the satisfaction of the owner's representative.
   1. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface as well as stains and other discolorations that cannot be removed by cleaning.
      a. Dampen concrete surfaces in contact with patching concrete and brush with neat cement grout or apply concrete bonding agent.
      b. Mix Patching concrete of same materials to provide concrete of same type of class as original concrete.
      c. Place, compact and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

END OF SECTION 03351

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SECTION 006500 – CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Inspection procedures
   2. Project Record Documents
   3. Operation and maintenance manuals
   4. Warranties
   5. Instruction of Owner's personnel
   6. Final cleaning

1.2 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following:
   1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
   2. Advise Owner of pending insurance changeover requirements.
   3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
   4. Obtain and submit a Certificate of Occupancy from the City Building Department for the use of the buildings.
   5. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
   6. Prepare and submit Project Record Documents and Operation and Maintenance Manuals.
   7. Deliver tools, spare parts, extra materials, materials designated in the construction documents, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
   8. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
   9. Complete startup testing of systems.
   10. Submit test/adjust/balance records.
   11. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
   12. Advise Owner of changeover in related utilities.
   13. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
   14. Complete final cleaning requirements, including touchup painting.
   15. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

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B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Owner's representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner's representative will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Owner's representative that must be completed or corrected before certificate will be issued.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected. Contractor to pay for the cost of all consultants' time for re-inspections on a time and materials basis if work is significantly incomplete.
   2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
   1. Submit a final Application for Payment according to Supplemental General Conditions.
   2. Submit certified copy of Owner's representative's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Owner's representative. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
   3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   4. Submit pest-control final inspection report and warranty.
   5. Submit a written certification that all construction has been completed with asbestos free materials.
   6. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Owner's representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner's representative will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

C. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected. Contractor to pay for the cost of all consultants' time for re-inspections on a time and materials basis if work is significantly incomplete.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of the list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
   1. Organize list of spaces in sequential order, starting with exterior areas first. For exterior spaces, identify major landmarks or adjacent amenities to describe the space.

B. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

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C. Include the following information at the top of each page:
   1. Project name
   2. Date
   3. Name of Owner’s representative
   4. Name of Contractor
   5. Page number

1.5 PROJECT RECORD DOCUMENTS

A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Owner’s representative's reference during normal working hours.

B. Record Drawings: Contractor to prepare, maintain, finalize and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings. Contractor to utilize a licensed surveyor to provide final elevation grades for record drawings. Contractor to provide the City with an electronic copy of the final record drawings.
   1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
      a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
      b. Accurately record information in an understandable drawing technique.
      c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
      d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.
   2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
   3. Mark important additional information that was either shown schematically or omitted from original Drawings.
   4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
   5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.
   6. Contractor shall review the record drawings on a monthly basis with the owner’s representative to verify that the record drawings are up to date. The contractor shall ensure that the record drawings reflect the actual construction progress accurate to within 48 hours.

C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
   1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.

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3. Note related Change Orders, Record Drawings, and Product Data, where applicable.
4. Contractor shall review the record specifications on a monthly basis with the owner's representative to verify that the record drawings are up to date. The contractor shall ensure that the record drawings reflect the actual construction progress accurate to within 48 hours.

D. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Drawings and Record Specifications, where applicable.

E. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.6 OPERATION AND MAINTENANCE MANUALS

A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Contractor to provide the City with an electronic copy of the operation and maintenance manuals. Include operation and maintenance data required in individual Specification Sections and as follows:
1. Operation Data:
   a. Emergency instructions and procedures.
   b. System, subsystem, and equipment descriptions, including operating standards.
   c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
   d. Description of controls and sequence of operations.
   e. Piping diagrams.
2. Maintenance Data:
3. Manufacturer's information, including list of spare parts.
4. Name, address, and telephone number of Installer or supplier.
5. Maintenance procedures.
6. Maintenance and service schedules for preventive and routine maintenance.
7. Maintenance record forms.
8. Sources of spare parts and maintenance materials.
9. Copies of maintenance service agreements.
10. Copies of warranties and bonds.

B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND

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MAINTENANCE MANUAL," Project name, and subject matter of contents. Submit 3 copies of the manual.

1.7 WARRANTIES

A. Submittal Time: Submit written warranties on request of Owner's representative for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
   1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
   2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
   3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 DEMONSTRATION AND TRAINING

A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
   1. Provide instructors experienced in operation and maintenance procedures.
   2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
   3. Schedule training with Owner, with at least seven days' advance notice.
   4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

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B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline. Include instruction for the following:
   1. System design and operational philosophy.
   2. Review of documentation.
   3. Operations.
   4. Adjustments.
   5. Troubleshooting.
   6. Maintenance.
   7. Repair.

3.2 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
   1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
   2. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
   3. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
   4. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
   5. Remove tools, construction equipment, machinery, and surplus material from Project site.
   6. Remove snow and ice to provide safe access to building.
   7. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
   8. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
   9. Sweep concrete floors broom clean in unoccupied spaces.
   10. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
   11. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
   12. Remove labels that are not permanent.
   13. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
       a. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

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14. Revise seven subparagraphs below to suit Project. Check for conflict or duplication with provisions in other Sections, particularly Divisions 15 and 16.
15. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
16. Replace parts subject to unusual operating conditions.
17. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
18. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
19. Subparagraph below is a major work item that may be disruptive to closeout procedures.
20. Clean ducts, blowers, and coils if units were operated without filters during construction.
21. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
22. Leave Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 006500

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SECTION 007200 – GENERAL CONDITIONS

PART 1 - GENERAL

1.1 The General Conditions of the Contract for Construction, MAG Uniform Standard Specifications for Public Works Construction, 2018 Revision to the 2015 Edition, General Conditions Section 101 through 110 are part of this Contract.

1.2 Electronic version of the MAG Uniform Standard Specifications for Public Works Construction, 2018 Revision to the 2015 Edition can be found at the following address:

http://azmag.gov/Portals/0/Documents/MagContent/2018_Specifications_and_Details_Book12.pdf

END OF SECTION 007200

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SECTION 013300 – SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Supplemental General Conditions and the Special Provisions, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Owner’s representative's responsive action.

B. Informational Submittals: Written information that does not require Owner’s representative’s approval. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. General: The Owner’s representative will not provide electronic copies of CAD Drawings of the Contract Drawings for Contractor's use in preparing submittals.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
      a. Owner’s representative reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Submittals Schedule: Submittals shall be submitted in a timely manner to allow adequate review time as scheduled below, resubmittal if necessary, and delivery of materials so as not to adversely affect the scheduled performance of related construction activities.

D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Owner’s representative's receipt of submittal.
   1. Initial Review: Allow 3 working days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent

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submittals. Owner's representative will advise Contractor when a submittal being processed must be delayed for coordination.

2. Delete subparagraph below if not required.
3. Concurrent Review: Where concurrent review of submittals by Owner's representative's consultants, Owner, or other parties is required, allow 7 working days for initial review of each submittal.
4. All submittals shall be routed as determined at the Pre-Construction Conference.
5. Insert list of submittals below requiring concurrent review, or delete and identify submittals in the Sections where they are specified. Structural, mechanical, plumbing, and electrical components are examples of the Work that often require concurrent review.
6. Allowing procedure in subparagraph below may cause tracking problems for Architect and Construction Manager, if any. Delete if not allowed. See Evaluations.
7. If intermediate submittal is necessary, process it in same manner as initial submittal.
8. Allow 5 working days for processing each resubmittal.
9. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

E. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Owner's representative.
3. Include the following information on label for processing and recording action taken:
   a. Revise list below to suit Project.
   b. Project name.
   c. Date.
   d. Name and address of Owner's representative.
   e. Name and address of Contractor.
   f. Name and address of subcontractor.
   g. Name and address of supplier.
   h. Name of manufacturer.
   i. Revise first subparagraph below to suit Project and office practice. See Evaluations.
   j. Unique identifier, including revision number.
   k. Number and title of appropriate Specification Section.
   l. Drawing number and detail references, as appropriate.
   m. Other necessary identification.

F. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.

G. Additional Copies: Unless additional copies are required for final submittal, and unless Owner's representative observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.

H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Owner's representative will return submittals, without review, received from sources other than Contractor.
1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Owner's representative on previous submittals, and deviations from requirements of the Contract

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Documents, including minor variations and limitations. Include the same label information as the related submittal.

2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
3. Transmittal Form: Provide locations on form to include the following information:
   a. Project name.
   b. Date.
   c. Destination (To:).
   d. Source (From:).
   e. Names of subcontractor, manufacturer, and supplier.
   f. Category and type of submittal.
   g. Submittal purpose and description.
   h. Submittal and transmittal distribution record.
   i. Remarks.
   j. Signature of transmitter.

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Use only final submittals with mark indicating action taken by Owner's representative in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.
   1. Number of Copies: Submit sufficient number of copies of each submittal as will allow the Owner's representative to retain four (4) copies of each submittal, unless otherwise indicated. Owner's representative will return the remaining marked up copies. Action submittals may also be submitted and returned electronically.
   2. O & M Manuals: The contractor shall retain one copy of all marked up submittals to be copied and incorporated in the O&M Manuals.
   3. Number of Copies: Submit copies of each submittal, as follows, unless otherwise indicated. Submittals may also be submitted and returned electronically:
      a. Initial Submittal: Submit three copies of each submittal where selection of options, color, pattern, texture, or similar characteristics is required. Owner's representative will return submittal with options selected.
      b. Final Submittal: Submit three copies, unless copies are required for operation and maintenance manuals. Submit five copies where copies are required for operation and maintenance manuals. Owner's representative will retain two copies; remainder will be returned. Mark up and retain one returned copy as a Project Record Document.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
   1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.

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2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
    a. Expand list below to suit Project.
    b. Manufacturer's written recommendations.
    c. Manufacturer's product specifications.
    d. Manufacturer's installation instructions.
    e. Standard color charts.
    f. Manufacturer's catalog cuts.
    g. Wiring diagrams showing factory-installed wiring.
    h. Printed performance curves.
    i. Operational range diagrams.
    j. Mill reports.
    k. Standard product operating and maintenance manuals.
    l. Compliance with recognized trade association standards.
    m. Compliance with recognized testing agency standards.
    n. Application of testing agency labels and seals.
    o. Notation of coordination requirements.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Include the following information, as applicable:
    a. Revise or expand list below to suit Project. Comply with Owner's requirements and office policy.
    b. Dimensions.
    c. Identification of products.
    d. Fabrication and installation drawings.
    e. Roughing-in and setting diagrams.
    f. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    g. Shop work manufacturing instructions.
    h. Templates and patterns.
    i. Schedules.
    j. Design calculations.
    k. Compliance with specified standards.
    l. Notation of coordination requirements.
    m. Notation of dimensions established by field measurement.
2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
4. Number of Copies: Submit copies of each submittal, as follows:
    a. Initial Submittal: Submit one correctable, translucent, reproducible print and two blue- or black-line prints. Submit five prints where prints are required for operation and maintenance manuals. Owner’s representative will return the reproducible print. Mark up and retain one returned print as a Project Record Drawing.
    b. Resubmittal: Same as initial submittal.

D. Samples: Prepare physical units of materials or products, including the following:
1. Provide sample panels and mock-ups as specified in the separate specification sections.

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2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Owner’s representative's sample where so indicated. Attach label on unexposed side that includes the following:
    a. Generic description of Sample.
    b. Product name or name of manufacturer.
    c. Sample source.
5. Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, provide the following:
    a. Size limitations.
    b. Compliance with recognized standards.
    c. Availability.
    d. Delivery time.
6. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.
    a. If variation in color, pattern, texture, or other characteristic is inherent in the product represented by a Sample, submit at least three sets of paired units that show approximate limits of the variations.
    b. Refer to individual Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
7. Number of Samples for Initial Selection: Submit three full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Owner’s representative will return submittal with options selected.
8. Number of Samples for Verification: Submit three sets of Samples. Owner’s representative will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.
    a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
9. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

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E. Product Schedule or List: Prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
   1. Type of product. Include unique identifier for each product.
   2. Number and name of room or space.
   3. Location within room or space.

F. Contractor's Construction Schedule: Comply with requirements in the SUPPLEMENTAL GENERAL CONDITIONS.

G. Submittals Schedule: Submit 3 copies of the Submittal Schedule within 7 working days of notice to proceed.

H. Application for Payment: Comply with requirements in the SUPPLEMENTAL GENERAL CONDITIONS.

I. Schedule of Values: Submit 3 copies of the Schedule of Values within 10 working days of the notice to proceed.

J. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Submit 3 copies. Include the following information in tabular form:
   1. Name, address, and telephone number of entity performing subcontract or supplying products.
   2. Number and title of related Specification Section(s) covered by subcontract.
   3. Drawing number and detail references, as appropriate, covered by subcontract.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.
   1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Owner’s representative will not return copies.
   2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
   3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."

B. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."

C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of Owner’s representatives and owners, and other information specified.

D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.

E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and

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Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.

G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.

I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

J. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.

K. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

L. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.

M. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

N. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

O. Maintenance and Operation Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Section 01770 "Closeout Procedures". Submit 3 copies.

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P. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

Q. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

R. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

S. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

T. Material Safety Data Sheets: Submit information directly to Owner. If submitted to Owner’s representative, Owner’s representative will not review this information but will return it with no action taken.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Owner’s representative.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date

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of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 OWNER’S REPRESENTATIVE'S ACTION

A. General: Owner’s representative will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Owner’s representative will review each submittal, make marks to indicate corrections or modifications required, and return it. Owner’s representative will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken.

C. Informational Submittals: Owner’s representative will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Owner’s representative will forward each submittal to appropriate party.

D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION 013300

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SECTION 015639 - TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

B. Related Sections:

1. Section 015000 "Temporary Facilities and Controls" for temporary site fencing.
2. Section 311000 "Site Clearing" for removing existing trees and shrubs.

1.3 DEFINITIONS

A. Caliper: Diameter of a trunk measured by a diameter tape or the average of the smallest and largest diameters at 6 inches (150 mm) above the ground for trees up to, and including, 4-inch (100-mm) size; and 12 inches (300 mm) above the ground for trees larger than 4-inch (100-mm) size.

B. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, to match edge of canopy.

C. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.

D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For each type of the following:

1. Organic Mulch: 1-quart (1-L) volume of organic mulch; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.
2. Protection-Zone Fencing: Assembled Samples of manufacturer's standard size made from full-size components
3. Protection-Zone Signage: Full-size Samples of each size and text, ready for installation.

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C. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

1. Species and size of tree.
2. Location on site plan. Include unique identifier for each.
3. Reason for pruning.
4. Description of pruning to be performed.
5. Description of maintenance following pruning.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified arborist and tree service firm.

B. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

C. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

D. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1. Use sufficiently detailed photographs or videotape.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

1.6 QUALITY ASSURANCE

A. Arborist Qualifications: Certified Arborist as certified by ISA

B. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.

C. Preinstallation Conference: Conduct conference at Project site

1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:

a. Construction schedule. Verify availability of materials, personnel, and equipment needed to make progress and avoid delays.
b. Enforcing requirements for protection zones.
c. Arborist's responsibilities.
d. Field quality control.

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1.7 PROJECT CONDITIONS

A. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil: Natural or cultivated top layer of the soil profile or manufactured topsoil; containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 1 inch (25 mm) in diameter; and free of weeds, roots, and toxic and other nonsoil materials.

1. Obtain topsoil only from well-drained sites where topsoil is 4 inches (100 mm) deep or more; do not obtain from bogs or marshes.

B. Topsoil: Stockpiled topsoil from location shown on Drawings

C. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:

1. Type: Partially composted Shredded hardwood, Ground or shredded bark, or Wood and bark chips
2. Size Range: 3 inches (76 mm) maximum, 1/2 inch (13 mm) minimum
3. Color: Natural.

D. Protection-Zone Fencing: Fencing fixed in position and meeting the following requirements.

1. Chain-Link Protection-Zone Fencing: Galvanized-steel fencing fabricated from minimum 2-inch (50-mm) opening, 0.148-inch- (3.76-mm-) diameter wire chain-link fabric; with pipe posts, minimum 2-3/8-inch- (60-mm-) OD line posts, and 2-7/8-inch- (73-mm-) OD corner and pull posts and 0.177-inch- (4.5-mm-) diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.

a. Height: 6 feet (1.8 m)

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2. Wood Protection-Zone Fencing: Constructed of two 2-by-4-inch (50-by-100-mm) horizontal rails, with 4-by-4-inch (100-by-100-mm) preservative-treated wood posts spaced not more than 8 feet (2.4 m) apart, and lower rail set halfway between top rail and ground.

    a. Height: 4 feet (1.2 m)

3. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch (50-mm) maximum opening in pattern and weighing a minimum of 0.4 lb/ft. (0.6 kg/m); remaining flexible from minus 60 to plus 200 deg F (minus 16 to plus 93 deg C); inert to most chemicals and acids; minimum tensile yield strength of 2000 psi (13.8 MPa) and ultimate tensile strength of 2680 psi (18.5 MPa); secured with plastic bands or galvanized-steel or stainless-steel wire ties; and supported by tubular or T-shape galvanized-steel posts spaced not more than 8 feet (2.4 m) apart.

    a. Height: 4 feet (1.2 m)
    b. Color: High-visibility orange, nonfading.

E. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading lettering.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

B. For the record, prepare written report, endorsed by arborist, listing conditions detrimental to tree and plant protection.

3.2 PREPARATION

A. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

C. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated.

1. Apply 4-inch (100-mm) average thickness of organic mulch. Do not place mulch within 6 inches (150 mm) of tree trunks.

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3.3 TREE- AND PLANT-PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones [before materials or equipment are brought on the site and construction operations begin] <Insert requirement> in a manner that will prevent people[and animals] from easily entering protected area except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

1. Chain-Link Fencing: Install to comply with ASTM F 567 and with manufacturer's written instructions.
2. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Architect.
3. Access Gates: Install [where indicated] <Insert requirement>; adjust to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Architect. Install one sign spaced approximately every 20 feet (6 m) on protection-zone fencing, but no fewer than four signs with each facing a different direction.

C. Maintain protection zones free of weeds and trash.

D. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

E. Maintain protection-zone fencing and signage in good condition as acceptable to Architect and remove when construction operations are complete and equipment has been removed from the site.

1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

3.4 EXCAVATION

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 312000 "Earth Moving."

B. Trenching near Trees: Where utility trenches are required within protection zones, hand excavate under or around tree roots or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning.

C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If

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encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches (75 mm) back from new construction and as required for root pruning.

D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3.5 ROOT PRUNING

A. Prune roots that are affected by temporary and permanent construction. Prune roots as follows:

1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
2. Cut Ends: Per Arborist Direction
3. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
4. Cover exposed roots with burlap and water regularly.
5. Backfill as soon as possible according to requirements in Section 312000 "Earth Moving."

B. Root Pruning at Edge of Protection Zone: Per Arborist Direction

C. Root Pruning within Protection Zone: Per Arborist Direction. Clear and excavate by hand to the depth of the required excavation to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

3.6 CROWN PRUNING

A. Prune branches that are affected by temporary and permanent construction. Prune branches per Arborist Direction.

1. Prune trees to remain to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by arborist.
2. Pruning Standards: Prune trees according to ANSI A300 (Part 1)

3. Cut branches with sharp pruning instruments; do not break or chop.
4. Do not apply pruning paint to wounds.

B. Chip removed branches and spread over areas identified by Landscape Architect and Arborist.

3.7 REGRADING

A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

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B. Lowering Grade within Protection Zone: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist unless otherwise indicated.

1. Root Pruning: Prune tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as required for root pruning.

C. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

D. Minor Fill within Protection Zone: Where existing grade is 2 inches (50 mm) or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.

3.8 FIELD QUALITY CONTROL

A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.9 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

1. Submit details of proposed root cutting and tree and shrub repairs.
2. Have arborist perform the root cutting, branch pruning, and damage repair of trees and shrubs.
3. Treat damaged trunks, limbs, and roots according to arborist's written instructions.
4. Perform repairs within 24 hours.
5. Replace vegetation that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Trees: Remove and replace trees indicated to remain that are more than 50 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.

1. Provide new trees of same size and species as those being replaced for each tree that measures 4 inches (100 mm) or smaller in caliper size.
2. Provide one new tree(s) of 4-inch (100-mm) caliper size for each tree being replaced that measures more than 4 inches (100 mm) in caliper size.

    a. Species: Species selected by Landscape Architect

3. Plant and maintain new trees as specified in Section 329300 "Plants."

3.10 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash and debris, and legally dispose of them off Owner's property.

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SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
   1. Concrete headers.
   2. Site walls.
   3. Slab on Grade.
   4. Footings

B. Related Sections:
   1. Section 321316 "Decorative Concrete Paving" for decorative concrete pavement and walks.
   2. Section 321373 " Concrete Paving Joint Sealants" for concrete pavement and walks.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

   1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.

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1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.

E. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1. Location of construction joints is subject to approval of the Landscape Architect.

F. Samples: For vapor retarder.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer manufacturer and testing agency.

B. Welding certificates.

C. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Fiber reinforcement.
6. Waterstops.
7. Curing compounds.
8. Floor and slab treatments.
9. Bonding agents.
10. Adhesives.
11. Vapor retarders.
12. Semirigid joint filler.
13. Joint-filler strips.
14. Repair materials.

D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

E. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

F. Field quality-control reports.

G. Minutes of preinstallation conference.

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1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

H. Mockups: Cast concrete slab-on-grade and formed-surface panels to demonstrate typical joints, surface finish, texture, tolerances, floor treatments, and standard of workmanship.

1. Build panel approximately 100 sq. ft. for slab-on-grade and 60 sq. ft. for formed surface in the location indicated or, if not indicated, as directed by Landscape Architect.
2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

I. Preinstallation Conference: Conduct conference at Project site.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

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a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Concrete subcontractor.
e. Special concrete finish subcontractor.

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.
2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
   a. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
3. Reckli formliner 2/208 Volta, or equal.

B. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

C. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.

D. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.

E. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

F. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

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G. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

H. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel smooth bars, cut true to length with ends square and free of burrs.

B. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775/A 775M.

C. Zinc Repair Material: ASTM A 780, zinc-based solder, paint containing zinc dust, or sprayed zinc.

D. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

2.4 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

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1. Portland Cement: ASTM C 150, Type II Supplement with the following:

    a. Fly Ash: ASTM C 618,
    b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Silica Fume: ASTM C 1240, amorphous silica.

C. Normal-Weight Aggregates: ASTM C 33, coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 3/4 inch (19 mm) nominal.

D. Water: ASTM C 94/C 94M and potable.

2.5 ADMIXTURES

A. Air-Entraining Admixture ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.6 VAPOR RETARDERS

A. Sheet Vapor Retarder: ASTM E 1745, Class A, Include manufacturer's recommended adhesive or pressure-sensitive tape.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Carlisle Coatings & Waterproofing, Inc.; Blackline 400.
    b. Fortifiber Building Systems Group; Moistop Ultra 15.
    c. Grace Construction Products, W. R. Grace & Co.; Florprufe 120.
    d. Insulation Solutions, Inc.; Viper VaporCheck 16
    e. Meadows, W. R., Inc.; Perminator 10 mil
    f. Raven Industries Inc.; Vapor Block 10.
    g. Reef Industries, Inc.; Griffolyn 10 mil Green.
    h. Stego Industries, LLC; Stego Wrap 10 mil Class A.

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2.7 CURING MATERIALS

A. Evaporation Retarder: ASTM C309 Type 2 Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Axim Italcementi Group, Inc.; CATEXOL CimFilm.
b. BASF Construction Chemicals - Building Systems; Confilm.
c. ChemMasters; SprayFilm.
d. Conspec by Dayton Superior; Aquafilm.
e. Dayton Superior Corporation; Sure Film (J-74).
f. Edoco by Dayton Superior; BurkeFilm.
g. Euclid Chemical Company (The), an RPM company; Eucobar.
h. Kaufman Products, Inc.; Vapor-Aid.
i. Lambert Corporation; LAMBCO Skin.
j. L&M Construction Chemicals, Inc.; E-CON.
k. Meadows, W. R., Inc.; EVAPRE.
l. Metalcrete Industries; Waterhold.
m. Nox-Crete Products Group; MONOFILM.
n. Sika Corporation; SikaFilm.
o. SpecChem, LLC; Spec Film.
p. Symons by Dayton Superior; Finishing Aid.
q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
r. Unitex; PRO-FILM.
s. Vexcon Chemicals, Inc.; Certi-Vex Envio Set.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

2.8 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.

C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

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1. Types I and II, non-load bearing Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

E. Reglets: Fabricate reglets of not less than 0.022-inch- (0.55-mm-) thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

F. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.9 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.
2. Combined Fly Ash and Pozzolan: 25 percent.
3. Ground Granulated Blast-Furnace Slag: 50 percent.
4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
5. Silica Fume: 10 percent.
6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to [0.06] [0.15] [0.30] [1.00] percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings: Proportion normal-weight concrete mixture as follows:

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1. Minimum Compressive Strength: 3500 psi (24.1 MPa) at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.40
3. Slump Limit: 4 inches (100 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture plus or minus 1 inch (25 mm).
4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch (38-mm) nominal maximum aggregate size.
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch (19-mm) nominal maximum aggregate size.

B. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 3500 psi (24.1 MPa) at 28 days.
2. Minimum Cementitious Materials Content: 470 lb/cu. yd. (279 kg/cu. m
3. Slump Limit: 4 inches (100 mm) plus or minus 1 inch (25 mm).
4. Air Content: 5.5percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch (38-mm) nominal maximum aggregate size.
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch (19-mm)] nominal maximum aggregate size.
6. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
7. a rate of [50 lb/cu. yd. (29.7 kg/cu. m)] <Insert weight>.
8. Synthetic Micro-Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd. (0.60 kg/cu. m)

C. Building Walls: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 3500 psi (24.1 MPa) at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.40
3. Slump Limit: 4 inches (100 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).
4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch (38-mm) nominal maximum aggregate size.
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch (19-mm) nominal maximum aggregate size.

2.11 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.12 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

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B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.
2. Class B, 1/4 inch (6 mm) for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer, refer to details for finish of exterior corners and edges of permanently exposed concrete.

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I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

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3.4 SHORES AND RESHORES

A. Comply with ACI 318 (ACI 318M) and ACI 301 for design, installation, and removal of shoring and reshoring.

1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.

C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder according to manufacturer's written instructions.

C. Granular Course: Cover vapor retarder with fine-graded granular material, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch (0 mm) or minus 3/4 inch (19 mm).

1. Place and compact a 1/2-inch- (13-mm-) thick layer of fine-graded granular material over granular fill.

3.6 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

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E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

F. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.

G. Zinc-Coated Reinforcement: Repair cut and damaged zinc coatings with zinc repair material according to ASTM A 780. Use galvanized steel wire ties to fasten zinc-coated steel reinforcement.

3.7 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

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D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.8 WATERSTOPS

A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.9 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

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3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.10 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and

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defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces to receive a rubbed finish

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

D. "Sand" or Acid Etch Finish: Dayton Superior Products Topcast 05 surface retarder finish. Refer to Manufacturer's installation recommendations for vertical applications.

E. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.11 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Landscape Architect before application.

3.12 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 6 inches (150 mm) high unless otherwise indicated; and extend base not less than 6 inches (150 mm) in each direction beyond the maximum dimensions

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of supported equipment unless otherwise indicated or unless required for seismic anchor support.

3. Minimum Compressive Strength: 3500 psi (24.1 MPa) at 28 days.
4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of concrete base.
5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base, and anchor into structural concrete substrate.
6. Prior to pouring concrete, place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
7. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.

3.13 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatues. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

    a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.

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b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

3.14 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.15 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Landscape Architect. Remove and replace concrete that cannot be repaired and patched to Landscape Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one-part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4 inch (19 mm). Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match

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before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
5. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Landscape Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.16 FIELD QUALITY CONTROL

A. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

B. Inspections:

1. Steel reinforcement placement.
2. Steel reinforcement welding.
3. Headed bolts and studs.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.

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7. Verification of concrete strength before removal of shores and forms from beams and slabs.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173/C 173M, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M.

    a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
    b. Cast and field cure [two] sets of two standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

    a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
    b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
9. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive

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strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 033000

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SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Steel **pipe and tube** railings.

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design railings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:

1. Steel: 72 percent of minimum yield strength.
2. Stainless Steel: 60 percent of minimum yield strength.

C. Structural Performance: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
b. Infill load and other loads need not be assumed to act concurrently.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

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E. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of mechanically connected railings.
2. Railing brackets.
3. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples for Initial Selection: For products involving selection of color, texture, or design.

D. Samples for Verification: For each type of exposed finish required.

1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
2. Fittings and brackets.
3. Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.

a. Show method of [**finishing**] [**connecting**] members at intersections.

E. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified **professional engineer**.

B. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

C. Welding certificates.

D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

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B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
3. AWS D1.6, "Structural Welding Code - Stainless Steel."

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.8 COORDINATION AND SCHEDULING

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, **available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following**:

1. Steel Pipe and Tube Railings:

a. Pisor Industries, Inc.
b. Wagner, R & B, Inc.; a division of the Wagner Companies.

2. Aluminum Pipe and Tube Railings:

a. ATR Technologies, Inc.
b. Blum, Julius & Co., Inc.
c. Braun, J. G., Company; a division of the Wagner Companies.
d. CraneVeyor Corp.
e. Hollaender Manufacturing Company.

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f. Kee Industrial Products, Inc.
g. Moultrie Manufacturing Company.
h. Pisor Industries, Inc.
i. Sterling Dula Architectural Products, Inc.; Div. of Kane Manufacturing.
j. Superior Aluminum Products, Inc.
k. Thompson Fabricating, LLC.
l. Tri Tech, Inc.
m. Tubular Specialties Manufacturing, Inc.
n. Tuttle Railing Systems; Div. of Tuttle Aluminum & Bronze, Inc.
o. Wagner, R & B, Inc.; a division of the Wagner Companies.

3. Stainless-Steel Pipe and Tube Railings:

a. Blum, Julius & Co., Inc.
b. Paragon Aquatics; Division of Pentair, Inc.
c. Pisor Industries, Inc.
d. Stainless Fabricators, Inc.
e. Sterling Dula Architectural Products, Inc.; Div. of Kane Manufacturing.
f. Tri Tech, Inc.
g. Tubular Specialties Manufacturing, Inc.
h. Tuttle Railing Systems; Div. of Tuttle Aluminum & Bronze, Inc.
i. Wagner, R & B, Inc.; a division of the Wagner Companies.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

2.3 STEEL AND IRON

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than **25** percent.

B. Tubing: **ASTM A 500 (cold formed) or ASTM A 513**.

C. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

1. Provide galvanized finish for exterior installations and where indicated.

D. Plates, Shapes, and Bars: ASTM A 36/A 36M.

E. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

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F. Perforated Metal: Cold-rolled steel sheet, ASTM A 1008/A 1008M, or hot-rolled steel sheet, ASTM A 1011/A 1011M, commercial steel Type B, See Details.

G. Perforated Metal: Galvanized-steel sheet, ASTM A 653/A 653M, G90 (Z275) coating, commercial steel Type B, See Details.

H. Woven-Wire Mesh: See Details.

2.4 STAINLESS STEEL

A. Tubing: ASTM A 554, **Grade MT 304**.

B. Pipe: ASTM A 312/A 312M, **Grade TP 304**.

C. Castings: ASTM A 743/A 743M, **Grade CF 8 or CF 20**

D. Woven-Wire Mesh: See Details.

2.5 FASTENERS

A. General: Provide the following:

1. Ungalvanized-Steel Railings: Plated steel fasteners complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5 for zinc coating.
2. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 for zinc coating.
3. Aluminum Railings: **Type 304** stainless-steel fasteners.
4. Stainless-Steel Railings: **Type 304** stainless-steel fasteners.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated **and capable of withstanding design loads**.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
2. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
3. Provide **tamper-resistant** flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: **Torque-controlled expansion anchors or chemical anchors** capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

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1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel is Indicated: Alloy [**Group 1 (A1)**] [**Group 2 (A4)**] stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

2.6 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

1. For **aluminum and stainless-steel** railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

B. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

E. Shop Primers: Provide primers that comply with **Section 099113 "Exterior Painting,"**

F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

G. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

2.7 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage**, but not less than that required to support structural loads**.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

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C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with **welded** connections unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

J. Form changes in direction as follows:

1. As detailed.
2. **By bending or by inserting prefabricated elbow fittings**].
3. **By flush bends or by inserting prefabricated flush-elbow fittings**].
4. **By radius bends of radius indicated or by inserting prefabricated elbow fittings of radius indicated**].

K. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

L. Close exposed ends of railing members with prefabricated end fittings.

M. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.

N. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

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1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers, or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

O. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

P. For railing posts set in concrete, provide **stainless-steel** sleeves not less than 6 inches (150 mm) long with inside dimensions not less than 1/2 inch (13 mm) greater than outside dimensions of post, with metal plate forming bottom closure.

Q. For removable railing posts, fabricate slip-fit sockets from **stainless-steel** tube or pipe whose ID is sized for a close fit with posts; limit movement of post without lateral load, measured at top, to not more than one-fortieth of post height. Provide socket covers designed and fabricated to resist being dislodged.

1. Provide chain with eye, snap hook, and staple across gaps formed by removable railing sections at locations indicated. Fabricate from same metal as railings.

R. Perforated-Metal Infill Panels: Fabricate infill panels from perforated metal made from **galvanized steel**

1. Edge panels with U-shaped channels made from metal sheet, of same metal as perforated metal and not less than 0.043 inch (1.1 mm) thick.
2. Orient perforated metal with pattern **as indicated on Drawings**

S. Woven-Wire Mesh Infill Panels: Fabricate infill panels from woven-wire mesh crimped into 1-by-1/2-by-1/8-inch (25-by-13-by-3-mm) metal channel frames. Make wire mesh and frames from same metal as railings in which they are installed.

1. Orient wire mesh **as indicated on Drawings**

T. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.8 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

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D. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

2.9 STEEL AND IRON FINISHES

A. Galvanized Railings:

1. Hot-dip galvanize **exterior** steel and iron railings, including hardware, after fabrication.
2. Hot-dip galvanize indicated steel and iron railings, including hardware, after fabrication.
3. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
4. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.
5. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
6. Fill vent and drain holes that will be exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

C. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.

D. For nongalvanized steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors to be embedded in exterior concrete or masonry.

E. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with **SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."**

1. Exterior Railings: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Railings Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
3. Railings Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
4. Other Railings: SSPC-SP 3, "Power Tool Cleaning."

F. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

1. Shop prime uncoated railings with **primers specified in Section 099113 "Exterior Painting"**
2. Do not apply primer to galvanized surfaces.

G. Shop-Painted Finish: Comply with **Section 099113 "Exterior Painting."**

1. Color: **As indicated on Materials Schedule**

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2.10 STAINLESS-STEEL FINISHES

A. Remove tool and die marks and stretch lines, or blend into finish.

B. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

C. 180-Grit Polished Finish: Oil-ground, uniform, directionally textured finish.

D. 320-Grit Polished Finish: Oil-ground, uniform, fine, directionally textured finish.

E. Polished and Buffed Finish: Oil-ground, 180-grit finish followed by buffing.

F. Directional Satin Finish: No. 4.

G. Dull Satin Finish: No. 6.

H. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).

C. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

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E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches (50 mm) beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches (150 mm) of post.

3.4 ANCHORING POSTS

A. Use metal sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with **nonshrink, nonmetallic grout or anchoring cement**, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Form or core-drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with **nonshrink, nonmetallic grout or anchoring cement**, mixed and placed to comply with anchoring material manufacturer's written instructions.

C. Cover anchorage joint with flange of same metal as post, **attached to post with set screws**.

D. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:

1. For aluminum pipe railings, attach posts using fittings designed and engineered for this purpose.
2. For stainless-steel pipe railings, weld flanges to post and bolt to supporting surfaces.
3. For steel pipe railings, weld flanges to post and bolt to metal supporting surfaces.

E. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.5 ATTACHING RAILINGS

A. Anchor railing ends at walls with round flanges anchored to wall construction and **welded to railing ends or connected to railing ends using nonwelded connections**.

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B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and [**welded to railing ends**] [**or**] [**connected to railing ends using nonwelded connections**].

C. Attach railings to wall with wall brackets. Provide brackets with 1-1/2-inch (38-mm) clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

1. Use type of bracket with **flange tapped for concealed anchorage to threaded hanger bolt**.
2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

D. Secure wall brackets and railing end flanges to building construction as follows:

1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For hollow masonry anchorage, use toggle bolts.
3. For wood stud partitions, use hanger or lag bolts set into studs or wood backing between studs. Coordinate with carpentry work to locate backing members.
4. For steel-framed partitions, use hanger or lag bolts set into **fire-retardant-treated** wood backing between studs. Coordinate with stud installation to locate backing members.
5. For steel-framed partitions, use self-tapping screws fastened to steel framing or to concealed steel reinforcements.
6. For steel-framed partitions, use toggle bolts installed through flanges of steel framing or through concealed steel reinforcements.

3.6 ADJUSTING AND CLEANING

A. Clean **stainless steel** by washing thoroughly with clean water and soap and rinsing with clean water.

B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

C. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in **Section 099113 "Exterior Painting"**

D. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

3.7 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

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SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following exterior substrates:
   1. Concrete – Lagoon Barrier Rails
   2. CMU w Stucco – Lagoon Barrier Columns and Existing Walls
   3. Galvanized Metal – Guardrails and Infill Meshes

B. See Architectural Specification for painting at Restrooms, Park Structures and Pavilion.

1.3 DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

D. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

E. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

F. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Initial Selection: For each type of topcoat product.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.

   1. Submit Samples on rigid backing, 8 inches (200 mm) square.

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2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
3. VOC content.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.6 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

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1.8 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

1. Behr Process Corporation.
2. Benjamin Moore & Co.
3. Benjamin Moore & Co. (Canada).
4. Bennette Paint Manufacturing Company, Inc.
5. Betonel Ltd.
6. BLP Mobile Paint Manufacturing.
7. California Paints.
8. Cloverdale Paint.
9. Color Wheel Paints & Coatings.
10. Columbia Paint & Coatings.
11. Conco Paints.
12. Coronado Paint.
13. Davis Paint Company.
14. Del Technical Coatings.
15. Diamond Vogel Paints.
16. Dunn-Edwards Corporation.
17. Durant Performance Coatings.
18. Duron, Inc.
19. Envirocoatings Canada Inc.
20. Euclid Chemical Company.
21. Farrell-Calhoun.
22. Frazee Paint.
23. General Paint.
24. Hallman Lindsay Paints.
25. Hirshfield's, Inc.
26. ICI Paints.
27. ICI Paints (Canada).
28. Insl-x.
29. Kelly-Moore Paints.
30. Kwal Paint.
31. Life Paint Corp.
32. M.A.B. Paints.
33. Microblend Technologies Inc.

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34. Miller Paint.
35. Mills Paint.
36. PARA Paints.
37. Parex LaHabra Inc.
38. Parker Paint Mfg. Co. Inc.
39. PPG Architectural Finishes, Inc.
40. Pratt & Lambert.
41. Rodda Paint Co.
42. Scott Paint.
43. Sherwin-Williams Company (The).
44. Sico, Inc.
45. Vista Paint.
46. Zinsser.

2.2 PAINT, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

C. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

D. Colors: As indicated in a color materials schedule – LM001

2.3 BLOCK FILLERS

A. Block Filler, Latex, Interior/Exterior: MPI #4.

2.4 PRIMERS/SEALERS

A. Primer, Alkali Resistant, Water Based:[MPI #3.]

B. Primer, Bonding, Water Based:[MPI #17.]

C. Primer, Bonding, Solvent Based:[MPI #69.]

D. Wood-Knot Sealer: Sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.

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2.5 METAL PRIMERS

A. Primer, Alkyd, Anti-Corrosive for Metal:[MPI #79.]

B. Primer, Alkyd, Quick Dry, for Metal:[MPI #76.]

C. Primer, Galvanized, Water Based:[MPI #134.]

D. Primer, Galvanized: As recommended in writing by topcoat manufacturer.

E. Primer, Quick Dry, for Aluminum:[MPI #95.]

2.6 WATER-BASED PAINTS

A. Latex, Exterior Flat (Gloss Level 1):[MPI #10.]

B. Latex, Exterior Low Sheen (Gloss Level 3-4):[MPI #15.]

C. Latex, Exterior Semi-Gloss (Gloss Level 5):[MPI #11.]

D. Latex, Exterior, Gloss (Gloss Level 6:[MPI #119.]

E. Light Industrial Coating, Exterior, Water Based (Gloss Level 3):[MPI #161.]

F. Light Industrial Coating, Exterior, Water Based, Semi-Gloss (Gloss Level 5):[MPI #163.]

G. Light Industrial Coating, Exterior, Water Based, Gloss (Gloss Level 6):[MPI #164.]

2.7 SOLVENT-BASED PAINTS

A. Alkyd, Exterior Flat (Gloss Level 1):[MPI #8.]

B. Alkyd, Exterior, Semi-Gloss (Gloss Level 5):[MPI #94.]

C. Alkyd, Exterior Gloss (Gloss Level 6):[MPI #9.]

D. Alkyd, Quick Dry, Semi-Gloss (Gloss Level 5):[MPI #81.]

E. Alkyd, Quick Dry, Gloss (Gloss Level 7):[MPI #96.]

2.8 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.

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3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (Clay and CMU): 12 percent.
3. Portland Cement Plaster: 12 percent.

C. Portland Cement Plaster Substrates: Verify that plaster is fully cured.

D. Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

E. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

F. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

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D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

F. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."
3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

I. Aluminum Substrates: Remove loose surface oxidation.

J. Wood Substrates:

1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
2. Sand surfaces that will be exposed to view, and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

K. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
4. Paint entire exposed surface of window frames and sashes.

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5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed to view:

a. Equipment, including panelboards and switch gear.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.
g. Tanks that do not have factory-applied final finishes.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

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C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE – See materials schedule LM001 for color information.

A. Concrete Substrates, Nontraffic Surfaces:

1. Latex System:

a. Prime Coat: Latex, exterior, matching topcoat.
b. Prime Coat: Primer, alkali resistant, water based[, MPI #3].
c. Intermediate Coat: Latex, exterior, matching topcoat.
d. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
e. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
f. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
g. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].

2. Latex Aggregate/Latex System:

a. Prime Coat: Textured coating, latex, flat[, MPI #42].
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
f. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].
g.

B. CMU Substrates:

1. Latex System:

a. Prime Coat: Block filler, latex, interior/exterior[, MPI #4].
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
f. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].

2. Latex over Alkali-Resistant Primer System:

a. Prime Coat: Primer, alkali resistant, water based[, MPI #3].
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
f. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].

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C. Steel Substrates:

1. Water-Based Light Industrial Coating System:

a. Prime Coat: Primer, alkyd, anti-corrosive for metal[, MPI #79].
b. Prime Coat: Shop primer specified in Section where substrate is specified.
c. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
d. Topcoat: Light industrial coating, exterior, water based (Gloss Level 3)[, MPI #161].
e. Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5)[, MPI #163].
f. Topcoat: Light industrial coating, exterior, water based, gloss (Gloss Level 6)[, MPI #164].

2. Alkyd System:

a. Prime Coat: Primer, alkyd, anticorrosive for metal[, MPI #79].
b. Prime Coat: Shop primer specified in Section where substrate is specified.
c. Intermediate Coat: Exterior alkyd enamel matching topcoat.
d. Topcoat: Alkyd, exterior, flat (Gloss Level 1)[, MPI #8].
e. Topcoat: Alkyd, exterior, semi-gloss (Gloss Level 5)[, MPI #94].
f. Topcoat: Alkyd, exterior, gloss (Gloss Level 6)[, MPI #9].

3. Quick-Drying Enamel System:

a. Prime Coat: Primer, alkyd, quick dry, for metal[, MPI #76].
b. Intermediate Coat: Alkyd, quick dry, matching topcoat.
c. Topcoat: Alkyd, quick dry, semi-gloss (Gloss Level 5)[, MPI #81].
d. Topcoat: Alkyd, quick dry, gloss (Gloss Level 7)[, MPI #96].

4. Aluminum Paint System:

a. Prime Coat: Primer, alkyd, anti-corrosive for metal[, MPI #79].
b. Prime Coat: Shop primer specified in Section where substrate is specified.
c. Intermediate Coat: Aluminum paint[, MPI #1].
d. Topcoat: Aluminum paint[, MPI #1].

D. Galvanized-Metal Substrates:

1. Latex System:

a. Prime Coat: Primer, galvanized, water based[, MPI #134].
b. Prime Coat: Primer, galvanized metal[, as recommended in writing by topcoat manufacturer for exterior use on galvanized-metal substrates with topcoat indicated].
c. Intermediate Coat: Latex, exterior, matching topcoat.
d. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
e. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
f. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
g. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].

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2. Water-Based Light Industrial Coating System:

    a. Prime Coat: Primer, galvanized, water based[, MPI #134].
    b. Prime Coat: Primer, galvanized metal, as recommended in writing by topcoat manufacturer for exterior use on galvanized-metal substrates with topcoat indicated.
    c. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
    d. Topcoat: Light industrial coating, exterior, water based (Gloss Level 3)[, MPI #161].
    e. Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5)[, MPI #163].
    f. Topcoat: Light industrial coating, exterior, water based, gloss (Gloss Level 6)[, MPI #164].

3. Alkyd System:

    a. Prime Coat: Primer, galvanized metal, as recommended in writing by topcoat manufacturer for exterior use on galvanized-metal substrates with topcoat indicated.
    b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
    c. Topcoat: Alkyd, exterior, flat (Gloss Level 5)[, MPI #8].
    d. Topcoat: Alkyd, exterior, semi-gloss (Gloss Level 5)[, MPI #94].
    e. Topcoat: Alkyd, exterior, gloss (Gloss Level 5)[, MPI #9].

E. Aluminum Substrates:

1. Latex System:

    a. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].
    b. Intermediate Coat: Latex, exterior, matching topcoat.
    c. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
    d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
    e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
    f. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].

2. Water-Based Light Industrial Coating System:

    a. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].
    b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
    c. Topcoat: Light industrial coating, exterior, water based (Gloss Level 3)[, MPI #161].
    d. Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5)[, MPI #163].
    e. Topcoat: Light industrial coating, exterior, water based, gloss (Gloss Level 6)[, MPI #164].

3. Alkyd System:

    a. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].

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b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
c. Topcoat: Alkyd, exterior, flat (Gloss Level 5)[, MPI #8].
d. Topcoat: Alkyd, exterior, semi-gloss (Gloss Level 5)[, MPI #94].
e. Topcoat: Alkyd, exterior, gloss (Gloss Level 5)[, MPI #9].

F. Portland Cement Plaster Substrates:

1. Latex System:

a. Prime Coat: Latex, exterior, matching topcoat.
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
f. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].

2. Latex over Alkali-Resistant Primer System:

a. Prime Coat: Primer, alkali resistant, water based[, MPI #3].
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
f. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].

END OF SECTION 099113

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SECTION 129300 - SITE FURNISHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Seating.
2. Tables.
3. Bike Racks.
4. Trash Receptacles.
5. Planter Pots.
6. Bollards.

B. Required Requirements:
1. Section 033000 "Cast-in-Place Concrete" for installing pipe sleeves cast, installing anchor bolts cast, and formed voids in concrete footings.
2. Section 312000 "Earth Moving" for excavation for installing concrete footings.

1.3 ACTION SUBMITTALS.

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified.

C. Samples for Initial Selection: For units with factory applied finishes.

D. Samples for Verification: For each type of exposed finish, not less than 6-inch long linear components and 4-inch square sheet components.
1. Include full-size samples of moveable chairs (all types).

E. Product Schedule: For site furnishings. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

1. Material Certificates: For site furnishings.
2. Wood Preservative Treatment: Include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.

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1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For all site furnishings to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Bench replacement slats: No fewer than two full size units for each size indicated.
   2. Trash Receptacles Inner Containers: Five Full Size units for each size indicated.
   3. Anchors.

PART 2 - PRODUCTS

2.1 SITE FURNISHINGS: SEE MATERIALS SCHEDULE LM100 FOR ALL PRODUCT INFORMATION. THIS INCLUDES BENCHES, TRASH RECEPTACLES, PLANTER POTS, BIKE RACKS, MOVABLE TABLES AND CHAIRS, UNLIT BOLLARDS AND OTHER SITE FURNISHINGS AS DEPICTED ON DRAWINGS.

A. Seating:

   1. Loll
      a. Adirondack Chair. Refer to LM100 Materials Schedule for finish and color.
   2. MMCITE
      a. Vera Solo-on Circular Bench. Refer to LM100 Materials Schedule for finish and color.
   3. Landscape Forms
      a. Bravo Bistro. Refer to LM100 Materials Schedule for finish and color.
      b. Perisphere 59” backed bench. Refer to LM100 Materials Schedule for finish and color.
      c. Perisphere 117” bench. Refer to LM100 Materials Schedule for finish and color.
      d. Perisphere 175” bench. Refer to LM100 Materials Schedule for finish and color.
      e. Harpo Chaise Lounge. Refer to LM100 Materials Schedule for finish and color.

B. Tables
   1. Landscape Forms
      a. Bravo Bistro. Refer to LM100 Materials Schedule for finish and color.
      b. Take-Out. Refer to LM100 Materials Schedule for finish and color.
      c. Parc Centre Table – Square Chess. Refer to LM100 Materials Schedule for finish and color.
   2. POPP
      a. Hero Ping Pong Table. Refer to LM100 Materials Schedule for finish and color.
      b. Installation Method: As indicated on Hardscape Detail Sheets.

C. Bicycle Racks:

   1. Landscape Forms
      a. Ring. Refer to LM100 Materials Schedule for finish and color.

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b. Installation Method: As indicated on Hardscape Detail Sheets.

D. Trash Receptacles:

1. Forms + Surfaces
   a. Tonyo. Refer to LM100 Materials Schedule for finish and color.
   b. Installation Method: As indicated on Hardscape Detail Sheets.
   c. Capacity: Not less than 36 gal.
2. MMCITE
   a. Valet. Refer to LM100 Materials Schedule for finish and color.
   b. Installation Method: As indicated on Hardscape Detail Sheets.

E. Planter Pots:
1. Landscape Forms
   a. Agave. Refer to LM100 Materials Schedule for finish and color.
   b. Installation Method: As indicated on Hardscape Detail Sheets.
2. QCP
   a. California Round. Refer to LM100 Materials Schedule for finish and color.
   b. Installation Method: As indicated on Hardscape Detail Sheets.

F. Drinking Fountains:
1. Urban+
   a. CF200. Refer to LM100 Materials Schedule for finish and color.
   b. Installation Method: As indicated by manufacturer.

G. Removable Bollard
1. Reliance Foundry
   a. R-8464 Removable Bollard. Refer to LM100 Materials Schedule for finish and color.
   b. Installation Method: As indicated on Hardscape Detail Sheets.

H. Shade Umbrella
1. Bahama
   a. Jumbrella. Refer to LM100 Materials Schedule for finish and color.
   b. Installation Method: As indicated on Hardscape Detail Sheets.

I. Shade Structure and Swing
1. Studio 431.
   a. Custom Swing Bench. Refer to LM100 Materials Schedule for finish and color.
   b. Installation Method: As indicated on Hardscape Detail Sheets.

2.2 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
1. Rolled or Cold-Finished Bars, Rods, and Wire: ASTM B 211.
2. Extruded Bars, Rods, Wire, Profiles, and Tubes: ASTM B 221.
3. Structural Pipe and Tube: ASTM B 429/B 429M.
4. Sheet and Plate: ASTM B 209.
5. Castings: ASTM B 26/B 26M.

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B. Steel and Iron:

1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
2. Steel Pipe: ASTM A 53/A 53M or ASTM A 135/A 135M.
3. Steel Tubing: Cold-formed steel tubing complying with ASTM A 500/A 500M.
4. Mechanical Tubing: Cold-rolled, electric-resistance-welded carbon or alloy steel tubing complying with ASTM A 513, or steel tubing fabricated from steel complying with ASTM A 1011/A 1011M and complying with dimensional tolerances in ASTM A 500/A 500M; zinc coated internally and externally.
5. Steel Sheet: Commercial steel sheet complying with ASTM A 1011/A 1011M.
6. Perforated Metal: From steel sheet not less than 0.090-inch (2.3-mm) nominal thickness;
7. manufacturer's standard perforation pattern.
8. Expanded Metal: Carbon-steel sheets deburred after expansion, and complying with
9. ASTM F 1267.
10. Malleable-Iron Castings: ASTM A 47/A 47M, grade as recommended by fabricator for type of use intended.
11. Gray-Iron Castings: ASTM A 48/A 48M, Class 200.

C. Stainless Steel
1. Sheet, Strip, Plate, and Flat Bars: ASTM A666.
2. Pipe: Schedule 40 steel pipe complying with ASTM A 312/A 312M.
3. Tubing: ASTM A 554.

D. Wood: Surfaced smooth on four sides with eased edges; kiln dried, free of knots, solid stock of species indicated.

1. Wood Species: **Manufacturer's standard**.

2. Certified Wood: Fabricate site furnishings with components produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, “FSC Principles and Criteria for Forest Stewardship.”

3. Finish: Manufacturer’s recommendation.

E. Fiberglass: Multiple laminations of glass-fiber-reinforced polyester resin with UV-light stable, colorfast, nonfading, weather- and stain-resistant, colored polyester gel coat, and manufacturer's standard finish.

F. Plastic: Color impregnated, color and UV-light stabilized, and mold resistant.
1. Polyethylene: Fabricated from virgin plastic HDPE resin.
2. Recycled Content of Polyethylene: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.

G. Anchors, Fasteners, Fittings, and Hardware: Manufacturer's standard, corrosion-resistant-coated or noncorrodible materials; commercial quality, tamperproof, vandal and theft resistant, concealed, recessed, and capped or plugged.
1. Angle Anchors: For inconspicuously bolting legs of site furnishings to on-grade substrate; extent as indicated.

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H. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M; recommended in writing by manufacturer, for exterior applications.
   1. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound; resistant to erosion from water exposure without needing protection by a sealer or waterproof coating; recommended in writing by manufacturer, for exterior applications.

I. Galvanizing: Where indicated for steel and iron components, provide the following protective zinc coating applied to components after fabrication:
   1. Zinc-Coated Tubing: External, zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq.ft. (0.27 kg/sq. m) of zinc after welding, a chromate conversion coating, and a clear, polymer film. Internal, same as external or consisting of 81 percent zinc pigmented coating, not less than 0.3 mil (0.0076 mm) thick.
   2. Hot-Dip Galvanizing: According to ASTM A 123/A 123M, ASTM A 153/A 153M, or ASTM A 924/A 924M.

2.3 FABRICATION

A. Metal Components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.

B. Welded Connections: Weld connections continuously. Weld solid members with full-length, full penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended, so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.

C. Pipes and Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.

D. Preservative-Treated Wood Components: Complete fabrication of treated items before treatment if possible. If cut after treatment, apply field treatment complying with AWPA M4 to cut surfaces.

E. Exposed Surfaces: Polished, sanded, or otherwise finished; all surfaces smooth, free of burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.

F. Factory Assembly: Assemble components in the factory to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

2.4 GENERAL FINISH REQUIREMENTS

A. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

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2.5 ALUMINUM FINISHES

A. Baked-Enamel, Powder-Coat Finish: Manufacturer’s standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

2.6 STEEL AND GALVANIZED-STEEL FINISHES

A. Baked-Enamel, Powder-Coat Finish: Manufacturer’s standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

B. PVC Finish: Manufacturer’s standard, UV-light stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish, with flame retardant added; complying with coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness.

2.7 IRON FINISHES

A. Baked-Enamel, Powder-Coat Finish: Manufacturer’s standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

2.8 STAINLESS STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
   1. Run directional finishes with long dimensions of each piece.
   2. Directional Satin Finish: No 4.
   3. Dull Satin Finish: No. 6.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer’s written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

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B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

C. Install site furnishings level, plumb, true, and securely anchored or positioned at locations indicated on Drawings.

D. Post Setting: Set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.

E. Posts Set into Voids in Concrete: Form or core-drill holes for installing posts in concrete to depth recommended in writing by manufacturer of site furnishings and 3/4 inch (19 mm) larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.

F. Pipe Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.

END OF SECTION 129300

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SECTION 321313 – CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following exterior substrates:
   1. Concrete – Lagoon Barrier Rails
   2. CMU w Stucco – Lagoon Barrier Columns and Existing Walls
   3. Galvanized Metal – Guardrails and Infill Meshes

B. See Architectural Specification for painting at Restrooms, Park Structures and Pavilion.

1.3 DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

D. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

E. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

F. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Initial Selection: For each type of topcoat product.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.

   1. Submit Samples on rigid backing, 8 inches (200 mm) square.

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2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
3. VOC content.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.6 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

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1.8 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

1. Behr Process Corporation.
2. Benjamin Moore & Co.
3. Benjamin Moore & Co. (Canada).
4. Bennette Paint Manufacturing Company, Inc.
5. Betonel Ltd.
6. BLP Mobile Paint Manufacturing.
7. California Paints.
8. Cloverdale Paint.
9. Color Wheel Paints & Coatings.
10. Columbia Paint & Coatings.
11. Conco Paints.
12. Coronado Paint.
13. Davis Paint Company.
14. Del Technical Coatings.
15. Diamond Vogel Paints.
16. Dunn-Edwards Corporation.
17. Durant Performance Coatings.
18. Duron, Inc.
19. Envirocoatings Canada Inc.
20. Euclid Chemical Company.
21. Farrell-Calhoun.
22. Frazee Paint.
23. General Paint.
24. Hallman Lindsay Paints.
25. Hirshfield's, Inc.
26. ICI Paints.
27. ICI Paints (Canada).
28. Insl-x.
29. Kelly-Moore Paints.
30. Kwal Paint.
31. Life Paint Corp.
32. M.A.B. Paints.
33. Microblend Technologies Inc.

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34. Miller Paint.
35. Mills Paint.
36. PARA Paints.
37. Parex LaHabra Inc.
38. Parker Paint Mfg. Co. Inc.
39. PPG Architectural Finishes, Inc.
40. Pratt & Lambert.
41. Rodda Paint Co.
42. Scott Paint.
43. Sherwin-Williams Company (The).
44. Sico, Inc.
45. Vista Paint.
46. Zinsser.

2.2 PAINT, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

C. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

D. Colors: As indicated in a color materials schedule – LM001

2.3 BLOCK FILLERS

A. Block Filler, Latex, Interior/Exterior: MPI #4.

2.4 PRIMERS/SEALERS

A. Primer, Alkali Resistant, Water Based: [MPI #3.]

B. Primer, Bonding, Water Based: [MPI #17.]

C. Primer, Bonding, Solvent Based: [MPI #69.]

D. Wood-Knot Sealer: Sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.

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2.5 METAL PRIMERS

A. Primer, Alkyd, Anti-Corrosive for Metal:[MPI #79.]

B. Primer, Alkyd, Quick Dry, for Metal:[MPI #76.]

C. Primer, Galvanized, Water Based:[MPI #134.]

D. Primer, galvanized: As recommended in writing by topcoat manufacturer.

E. Primer, Quick Dry, for Aluminum: [MPI #95.]

2.6 WATER-BASED PAINTS

A. Latex, Exterior Flat (Gloss Level 1):[MPI #10.]

B. Latex, Exterior Low Sheen (Gloss Level 3-4):[MPI #15.]

C. Latex, Exterior Semi-Gloss (Gloss Level 5):[MPI #11.]

D. Latex, Exterior, Gloss (Gloss Level 6:[MPI #119.]

E. Light Industrial Coating, Exterior, Water Based (Gloss Level 3):[MPI #161.]

F. Light Industrial Coating, Exterior, Water Based, Semi-Gloss (Gloss Level 5):[MPI #163.]

G. Light Industrial Coating, Exterior, Water Based, Gloss (Gloss Level 6):[MPI #164.]

2.7 SOLVENT-BASED PAINTS

A. Alkyd, Exterior Flat (Gloss Level 1):[MPI #8.]

B. Alkyd, Exterior, Semi-Gloss (Gloss Level 5):[MPI #94.]

C. Alkyd, Exterior Gloss (Gloss Level 6):[MPI #9.]

D. Alkyd, Quick Dry, Semi-Gloss (Gloss Level 5):[MPI #81.]

E. Alkyd, Quick Dry, Gloss (Gloss Level 7):[MPI #96.]

2.8 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.

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3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (Clay and CMU): 12 percent.
3. Portland Cement Plaster: 12 percent.

C. Portland Cement Plaster Substrates: Verify that plaster is fully cured.

D. Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

E. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

F. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, workers skilled in the trades invoinvolvednstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

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D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

F. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."
3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

I. Aluminum Substrates: Remove loose surface oxidation.

J. Wood Substrates:

1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
2. Sand surfaces that will be exposed to view, and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

K. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
4. Paint entire exposed surface of window frames and sashes.

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5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint undercoats same color as topcoat but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed to view:

a. Equipment, including panelboards and switch gear.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.
g. Tanks that do not have factory-applied final finishes.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

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C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE – See materials schedule LM001 for color information.

A. Concrete Substrates, Nontraffic Surfaces:

1. Latex System:

a. Prime Coat: Latex, exterior, matching topcoat.
b. Prime Coat: Primer, alkali resistant, water based[, MPI #3].
c. Intermediate Coat: Latex, exterior, matching topcoat.
d. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
e. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
f. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
g. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].

2. Latex Aggregate/Latex System:

a. Prime Coat: Textured coating, latex, flat[, MPI #42].
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
f. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].
g.

B. CMU Substrates:

1. Latex System:

a. Prime Coat: Block filler, latex, interior/exterior[, MPI #4].
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
f. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].

2. Latex over Alkali-Resistant Primer System:

a. Prime Coat: Primer, alkali resistant, water based[, MPI #3].
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
f. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].

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C. Steel Substrates:

1. Water-Based Light Industrial Coating System:

a. Prime Coat: Primer, alkyd, anti-corrosive for metal[, MPI #79].
b. Prime Coat: Shop primer specified in Section where substrate is specified.
c. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
d. Topcoat: Light industrial coating, exterior, water based (Gloss Level 3)[, MPI #161].
e. Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5)[, MPI #163].
f. Topcoat: Light industrial coating, exterior, water based, gloss (Gloss Level 6)[, MPI #164].

2. Alkyd System:

a. Prime Coat: Primer, alkyd, anticorrosive for metal[, MPI #79].
b. Prime Coat Shop primer specified in Section where substrate is specified.
c. Intermediate Coat: Exterior alkyd enamel matching topcoat.
d. Topcoat: Alkyd, exterior, flat (Gloss Level 1)[, MPI #8].
e. Topcoat: Alkyd, exterior, semi-gloss (Gloss Level 5)[, MPI #94].
f. Topcoat: Alkyd, exterior, gloss (Gloss Level 6)[, MPI #9].

3. Quick-Drying Enamel System:

a. Prime Coat: Primer, alkyd, quick dry, for metal[, MPI #76].
b. Intermediate Coat: Alkyd, quick dry, matching topcoat.
c. Topcoat: Alkyd, quick dry, semi-gloss (Gloss Level 5)[, MPI #81].
d. Topcoat: Alkyd, quick dry, gloss (Gloss Level 7)[, MPI #96].

4. Aluminum Paint System:

a. Prime Coat: Primer, alkyd, anti-corrosive for metal[, MPI #79].
b. Prime Coat: Shop primer specified in Section where substrate is specified.
c. Intermediate Coat: Aluminum paint[, MPI #1].
d. Topcoat: Aluminum paint[, MPI #1].

D. Galvanized-Metal Substrates:

1. Latex System:

a. Prime Coat: Primer, galvanized, water based[, MPI #134].
b. Prime Coat: Primer, galvanized metal[, as recommended in writing by topcoat manufacturer for exterior use on galvanized-metal substrates with topcoat indicated].
c. Intermediate Coat: Latex, exterior, matching topcoat.
d. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
e. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
f. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
g. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].

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2. Water-Based Light Industrial Coating System:

    a. Prime Coat: Primer, galvanized, water based[, MPI #134].
    b. Prime Coat: Primer, galvanized metal, as recommended in writing by topcoat manufacturer for exterior use on galvanized-metal substrates with topcoat indicated.
    c. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
    d. Topcoat: Light industrial coating, exterior, water based (Gloss Level 3)[, MPI #161].
    e. Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5)[, MPI #163].
    f. Topcoat: Light industrial coating, exterior, water based, gloss (Gloss Level 6)[, MPI #164].

3. Alkyd System:

    a. Prime Coat: Primer, galvanized metal, as recommended in writing by topcoat manufacturer for exterior use on galvanized-metal substrates with topcoat indicated.
    b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
    c. Topcoat: Alkyd, exterior, flat (Gloss Level 5)[, MPI #8].
    d. Topcoat: Alkyd, exterior, semi-gloss (Gloss Level 5)[, MPI #94].
    e. Topcoat: Alkyd, exterior, gloss (Gloss Level 5)[, MPI #9].

E. Aluminum Substrates:

1. Latex System:

    a. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].
    b. Intermediate Coat: Latex, exterior, matching topcoat.
    c. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
    d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
    e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
    f. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].

2. Water-Based Light Industrial Coating System:

    a. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].
    b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
    c. Topcoat: Light industrial coating, exterior, water based (Gloss Level 3)[, MPI #161].
    d. Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5)[, MPI #163].
    e. Topcoat: Light industrial coating, exterior, water based, gloss (Gloss Level 6)[, MPI #164].

3. Alkyd System:

    a. Prime Coat: Primer, quick dry, for aluminum[, MPI #95].

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b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
c. Topcoat: Alkyd, exterior, flat (Gloss Level 5)[, MPI #8].
d. Topcoat: Alkyd, exterior, semi-gloss (Gloss Level 5)[, MPI #94].
e. Topcoat: Alkyd, exterior, gloss (Gloss Level 5)[, MPI #9].

F. Portland Cement Plaster Substrates:

1. Latex System:

a. Prime Coat: Latex, exterior, matching topcoat.
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
f. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].

2. Latex over Alkali-Resistant Primer System:

a. Prime Coat: Primer, alkali resistant, water based[, MPI #3].
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1)[, MPI #10].
d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4)[, MPI #15].
e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5)[, MPI #11].
f. Topcoat: Latex, exterior gloss (Gloss Level 6)[, MPI #119].

END OF SECTION 099113

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SECTION 321316 - DECORATIVE CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes colored concrete paving.

B. Related Sections:

1. Section 033000 "Cast-in-Place Concrete" for general building applications of concrete.
2. Section 033300 "Architectural Concrete" for general building applications of specially finished formed concrete.
3. Section 003351 “Exposed Aggregate Concrete” for cast-in-place concrete paving finish.
4. Section 321313 "Concrete Paving" for cast-in-place concrete paving with other finishes, curbs and gutters, pavement markings, and wheel stops.
5. Section 321373 "Concrete Paving Joint Sealants" for joint sealants in expansion and contraction joints within decorative concrete paving and in joints between decorative concrete paving and asphalt paving or adjacent construction.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For each type of exposed color, pattern, or texture indicated.

C. Other Action Submittals:

1. Design Mixtures: For each decorative concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified installer, ready-mix concrete manufacturer and testing agency.

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B. Material Certificates: For the following, from manufacturer:
   1. Color Pigment Admixtures.
   2. Applied finish materials.
   3. Joint fillers.

C. Material Test Reports: For each of the following:

   1. Aggregates.

D. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer of decorative concrete paving systems.

B. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

C. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

   1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

D. Source Limitations: Obtain decorative concrete paving products and each type or class of cementitious material of the same brand from same manufacturer's plant, and obtain each aggregate from single source.

E. Concrete Testing Service: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures.

F. ACI Publications: Comply with ACI 301 unless otherwise indicated.

G. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

   1. Build mockups of full-thickness sections of decorative concrete paving to demonstrate typical joints; surface color, pattern, and texture; curing; and standard of workmanship.
   2. Build mockups of decorative concrete paving in the location and of the size indicated or, if not indicated, build mockups where directed by Architect and not less than 96 inches by 96 inches.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

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4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

H. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to decorative concrete paving, including but not limited to, the following:

a. Concrete mixture design.
b. Quality control of concrete materials and decorative concrete paving construction practices.

2. Require representatives of each entity directly concerned with decorative concrete paving to attend, including the following:

a. Contractor's superintendent.
b. Decorative concrete paving Installer.
c. Owner’s Representative.
d. Landscape Architect.

1.7 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves of a radius of 100 feet or less. Do not use notched and bent forms.

B. Forms for Textured Finish Concrete: Units of face design, size, arrangement, and configuration indicated. Provide solid backing and form supports to ensure stability of textured form liners.

C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

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B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.

C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

D. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60, deformed bars; assembled with clips.

E. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.

F. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 plain-steel bars. Cut bars true to length with ends square and free of burrs.

G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, gray portland cement Type II. Supplement with the following:

B. Normal-Weight Aggregates: ASTM C 33, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Aggregate Size: 3/4 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: Potable and complying with ASTM C 94/C 94M.

D. Air-Entraining Admixture: ASTM C 260.

E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A, colored.
2. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D, colored.
3. Water-Reducing and Accelerating Admixture: ASTM C 494/C 494M, Type E.

F. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, nonfading, and resistant to lime and other alkalis.

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1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. Davis Colors.
      1) Kailua
      2) Cocoa

2.4 CURING AND SEALING MATERIALS

A. Curing Paper: Nonstaining, waterproof paper, consisting of two layers of kraft paper cemented together and reinforced with fiber, and complying with ASTM C 171.

B. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

C. Type I, Class B, manufactured for colored concrete.

1. For integrally colored concrete, curing compound shall be pigmented type approved by coloring admixture manufacturer.

2.5 RELATED MATERIALS

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Epoxy Bonding Adhesive: ASTM C 881/C 881M, two-component epoxy resin capable of humid curing and bonding to damp surfaces; of class suitable for application temperature, of grade complying with requirements, and of the following types:

1. Type II, for bonding hardened or freshly mixed concrete to hardened concrete.

D. Polyethylene Film: ASTM D 4397, 1 mil thick, clear.

2.6 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): 3000 psi.
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.50.

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C. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below decorative concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph (5 km/h).
2. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of [1/2 inch according to requirements in Section 312000 "Earth Moving."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

B. Protect adjacent construction from discoloration and spillage during application of color hardeners, release agents, stains, curing compounds, and sealers.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

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3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap to adjacent mats.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Butt Joints: Use epoxy bonding adhesive at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
3. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
4. Dowelled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

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2. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

D. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation and items to be embedded or cast-in.

B. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

C. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

D. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

E. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

F. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels and joint devices.

G. Screed paving surface with a straightedge and strike off.

H. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

I. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.

J. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

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1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 INTEGRALLY COLORED CONCRETE FINISH

A. See Section 003351 – EXPOSED AGGREGATE CONCRETE

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Curing Compound: Apply curing compound immediately after final finishing. Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected to heavy rainfall within three hours after application. Maintain continuity of coating, and repair damage during curing period.

1. Cure integrally colored concrete with a pigmented curing compound.

E. Scoring: Score decorative jointing in paving surfaces 1 inch deep with diamond blades to match pattern indicated. Rinse until water is clear.

1. Joint Width: 1/4 inch.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 3/4 inch.
2. Thickness: Plus 3/8 inch , minus 1/4 inch.
3. Lateral Alignment and Spacing of Dowels: 1 inch.
4. Vertical Alignment of Dowels: 1/4 inch.
5. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge:
6. Joint Spacing: 3 inches.
7. Contraction Joint Depth: Plus 1/4 inch, no minus.

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8. Joint Width: Plus 1/8 inch, no minus.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 5000 sq. ft. or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

    a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

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G. Decorative concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare test and inspection reports.

3.11 REPAIRS AND PROTECTION

A. Remove and replace decorative concrete paving that is broken or damaged or does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Detailing: Grind concrete "squeeze" left from tool placement. Color ground areas with slurry of color hardener mixed with water and bonding agent. Remove excess release agent with high-velocity blower.

C. Protect decorative concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain decorative concrete paving free of stains, discoloration, dirt, and other foreign material

E. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

3.12 DECORATIVE CONCRETE PAVING SCHEDULE

A. See LM100 Materials Schedule for concrete paving color and finishes.:

END OF SECTION 321316

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SECTION 321373 - CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Cold-applied joint sealants.
2. Hot-applied joint sealants.

B. Related Sections:
1. Section 033000 "Cast-in-Place Concrete" for constructing joints in concrete pavement.

1.3 PRECONSTRUCTION TESTING

A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, Samples of materials that will contact or affect joint sealants.

1. Use manufacturer's standard test method to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit no fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
5. Testing will not be required if joint-sealant manufacturers submit joint-preparation data that are based on previous testing, not older than 24 months, of sealant products for compatibility with and adhesion to joint substrates and other materials matching those submitted.

1.4 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Pavement-Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.

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4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer and testing agency.

B. Product Certificates: For each type of joint sealant and accessory, from manufacturer.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for joint sealants.

D. Preconstruction Compatibility and Adhesion Test Reports: From joint-sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility with and adhesion to joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each type of joint sealant from single source from single manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.7 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

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PART 2 - PRODUCTS

2.1 MATERIALS

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

2.2 COLD-APPLIED JOINT SEALANTS

A. Single-Component, Nonsag, Silicone Joint Sealant for Concrete: ASTM D 5893, Type NS.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Crafco Inc., an ERGON company; RoadSaver Silicone.
b. Dow Corning Corporation; 888.
c. Pecora Corporation; 301 NS.

B. Single-Component, Self-Leveling, Silicone Joint Sealant for Concrete: ASTM D 5893, Type SL.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Crafco Inc., an ERGON company; RoadSaver Silicone SL.
b. Dow Corning Corporation; 890-SL.
c. Pecora Corporation; 300 SL.

C. Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant for Concrete: ASTM C 920, Type M, Grade P, Class 25, for Use T.

1. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

a. Pecora Corporation; Urexpan NR-200.

2.3 HOT-APPLIED JOINT SEALANTS

A. Hot-Applied, Single-Component Joint Sealant for Concrete: ASTM D 3406.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Crafco Inc., an ERGON company; Superseal 444/777.

B. Hot-Applied, Single-Component Joint Sealant for Concrete and Asphalt: ASTM D 6690, Types I, II, and III.

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1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Meadows, W. R., Inc.; [Sealtight Hi-Spec] [Sealtight 3405].
   b. Right Pointe; D-3405 Hot Applied Sealant.

2.4 JOINT-SEALANT BACKER MATERIALS

A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.

B. Backer Strips for Cold- and Hot-Applied Joint Sealants: ASTM D 5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

2.5 PRIMERS

A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

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3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.

B. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install joint-sealant backings of kind indicated to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of joint-sealant backings.
2. Do not stretch, twist, puncture, or tear joint-sealant backings.
3. Remove absorbent joint-sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install joint sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place joint sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants according to the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:

1. Remove excess joint sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.

3.4 CLEANING

A. Clean off excess joint sealant or sealant smears adjacent to joints as the Work progresses, by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants, during and after curing period, from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint

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sealants immediately and replace with joint sealant so installations in repaired areas are indistinguishable from the original work.

3.6 PAVEMENT-JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Joints within cement concrete pavement

1. Joint Location:

   a. Expansion and isolation joints in cast-in-place concrete pavement.
   b. Contraction joints in cast-in-place concrete slabs.
   c. Other joints as indicated.

2. Silicone Joint Sealant for Concrete: Single component, nonsag Single component, self-leveling
3. Urethane Joint Sealant for Concrete: Multicomponent, pourable, traffic-grade
4. Hot-Applied Joint Sealant for Concrete: Single component

B. Joint-Sealant Application: Joints between cement concrete and asphalt pavement.

1. Joint Location:

   a. Joints between concrete and asphalt pavement.
   b. Joints between concrete curbs and asphalt pavement.
   c. Other joints as indicated.

2. Hot-Applied Joint Sealant for Concrete and Asphalt: Single component

C. Joint-Sealant Application: Joints within cement concrete pavement at Splash Pad.

1. Joint Location:

   a. Expansion and isolation joints in cast-in-place concrete pavement at splash pad.
   b. Contraction joints in cast-in-place concrete slabs pavement at splash pad.

2. Silicone Joint Sealant for Concrete: Single component, nonsag Single component, self-leveling

END OF SECTION 321373

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SECTION 321400 - UNIT PAVING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Samples for selecting unit pavers.

PART 2 - PRODUCTS

2.1 UNIT PAVERS

A. Concrete Pavers: Solid, interlocking paving units, ASTM C 936/C 936M, made from normal-weight aggregates.

1. Ackerstone
   a. Thickness: 8cm min. 100 cm where indicated on LM100.
   b. Face Size and Shape: Refer to LM100.
   c. Chamfer: Micro
   d. Color: Refer to LM100.
2. Wausau
   a. Thickness: 2-3/4”.
   b. Face Size and Shape: 24” x 24” Square.
   c. Ribbed.
   d. Color: Refer to LM100.

2.2 AGGREGATE SETTING-BED MATERIALS

A. Graded Aggregate for Base: Sound-crushed stone or gravel, ASTM D 448, Size No. 8.

B. Sand for Leveling Course: ASTM C 33/C 33M, fine aggregate.

C. Sand for Joints: Fine, sharp, washed sand or crushed stone with 100 percent passing the No. 16 sieve and no more than 10 percent passing the No. 200 sieve.

D. Geotextile: Woven or nonwoven polyester or polypropylene complying with AASHTO M 288.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Proof-roll prepared subgrade surface and correct deficiencies before installing unit pavers.

B. Cut unit pavers with masonry saw or block splitter.

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C. Tolerances: Do not exceed 1/16-inch unit-to-unit offset (lippage) nor 1/4 inch in 10 feet from level or indicated slope.

3.2 AGGREGATE SETTING-BED PAVER INSTALLATION

A. Place aggregate base and compact with plate vibrator.

B. Place geotextile over compacted base course overlapping ends and edges at least 12 inches.

C. Place sand for leveling course to a thickness of 1 to 1-1/2 inches.

D. Treat leveling base with soil sterilizer.

E. Set pavers with a minimum joint width of 1/16 inch and a maximum of 1/8 inch. If pavers have spacer bars, place pavers hand-tight against spacer bars.

F. Vibrate pavers into leveling course with at least three passes of a low-amplitude plate vibrator capable of a 3500- to 5000-lbf compaction force at 80 to 90 Hz.

G. Spread dry sand and fill joints immediately after vibrating pavers into leveling course. Vibrate pavers and add sand until joints are completely filled, then remove excess sand.

H. Repeat joint-filling process 30 days later.

END OF SECTION 321400

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SECTION 321443 - POROUS UNIT PAVING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Samples for selecting unit pavers.

PART 2 - PRODUCTS

2.1 CONCRETE UNIT PAVERS

A. Concrete Grid Pavers: ASTM C 1319, made from normal-weight aggregates.

1. Ackerstone.

2. Thickness: 100cm.

2.2 AGGREGATE SETTING-BED MATERIALS

A. Graded Aggregate for Base: Sound-crushed stone or gravel, ASTM D 448 for Size **No. 47**.

B. Sand for Leveling Course: ASTM C 33/C 33M, fine aggregate.

C. Graded Aggregate for Porous Paver Fill: Sound-crushed stone or gravel complying with ASTM D 448 for Size **No. 8** or **No. 9**.

D. Drainage Geotextile: Nonwoven needle-punched geotextile, complying with AASHTO M 288.

1. Apparent Opening Size: No. 40 sieve, maximum; ASTM D 4751.
2. Permittivity: 0.5 per second, minimum; ASTM D 4491.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Proof-roll prepared subgrade surface and correct deficiencies before installing unit pavers.

B. Cut unit pavers with masonry saw or block splitter.

C. Tolerances: Do not exceed 1/16-inch unit-to-unit offset (lippage) nor 1/4 inch in 10 feet from level or indicated slope.

D. Install edge restraints before placing unit pavers.

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3.2 AGGREGATE SETTING-BED PAVER INSTALLATION

A. Place aggregate base, compact with plate vibrator, and screed to depth indicated.

B. Place drainage geotextile over compacted base course, overlapping ends and edges at least 12 inches.

C. Place leveling course and screed to a thickness of [**1 to 1-1/2 inches (25 to 38 mm)**] [**2 to 2-1/2 inches (50 to 64 mm)**] [**3 inches (76 mm)**] <**Insert dimension**>.

D. Set pavers with a minimum joint width of 1/16 inch and a maximum of 1/8 inch. If pavers have spacer bars, place pavers hand-tight against spacer bars.

E. Vibrate pavers into leveling course with at least three passes of a low-amplitude plate vibrator capable of a 3500- to 5000-lbf compaction force at 80 to 90 Hz.

F. Place graded aggregate fill immediately after vibrating pavers into leveling course. Spread and screed aggregate fill level with tops of pavers.

END OF SECTION 321443

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SECTION 32 15 40 - CRUSHED STONE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Contract Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes requirements for demolition, earthwork, grading, furnishing, and placement of crushed stone paving.
   1. Furnish and place crushed stone paving, bonded with fine aggregate, constructed on a prepared underlying base course in accordance with these specifications and in conformity with the dimensions, typical cross section, and the lines and grades shown on the Contract Drawings. The locations where crushed stone paving will be used are shown on the Contract Drawings.

1.3 REFERENCES

A. ASTM C117 – Test Method for Materials Finer than No. 200 (75-um) Sieve in Mineral Aggregates by Washing.

B. ASTM C136 – Method for Sieve Analysis of Fine and Coarse Aggregates.

C. ASTM D4318 – Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

1.4 SUBMITTALS

A. Material Analysis: Contractor shall provide copies of the following test data required by ASTM:
   1. ASTM C136 - Sieve Analysis.
   2. ASTM C127 - Specific Gravity and Absorption.
   3. ASTM C131 - L.A. Abrasion.

B. Samples: Provide a one (1) gallon sample of material for approval.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

B. Bulk Materials:
   1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas, plant materials or within critical root zones.
   2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
   3. Accompany each delivery of bulk materials with appropriate certificates.

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C. Rejection of material.
   1. Evidence of inadequate protection or improper handling or storage shall be cause for rejection.
   2. Any product or material exhibiting signs of damage due to nonconformity to specifications or due to delivery, storage or handling shall be rejected by the Project Manager. Contractor shall be responsible for hauling off-site and disposing of according to general conditions and codes of the governing jurisdiction.

1.6 PROJECT CONDITIONS

A. Environmental requirements: Work shall occur only when weather and soil conditions permit in accordance with locally accepted practice.

B. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with proposed crushed stone paving areas by field measurements before proceeding with work.

C. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others.

D. Existing Conditions:
   1. Utilities: Determine location of existing and proposed underground utilities. Perform work in a manner to avoid damage. Hand excavate, as required.
   2. Excavation: Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.

E. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained.

1.7 MAINTENANCE SERVICE

A. General: Maintain Work in accordance with Division 01.
   1. Maintenance Period: Begin maintenance immediately after Work is completed. Maintain areas until the end of the Warranty period.

1.8 WARRANTY

A. See Division 01 Section “Warranty”.

PART 2 - PRODUCTS

2.1 CRUSHED STONE PAVING

A. Type: Crushed granite stone or gravel. Shall be unused material free of shale, lay, friable materials, organics and debris.
   1. Size Range: 1/4 inch Minus
   2. Color: See Materials Schedule LM001
   3. Acceptable Supplier: Rock Pros

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2.2 SOIL STABILIZER

A. Soil stabilizer or binder:
   1. Acceptable manufacturer: ROMEX® 1-844-529-2330
   2. Product: ROMEX® PROFI-DEKO Gravel Binder
   3. Color: Colorless when cured.
   4. Form: Liquid

B. Construction Site Preparation: Prepare the foundation for expected traffic loads. Ensure the substructure is water-permeable. Follow regulations and guides for paved stone surfaces. Ensure the subsurface won't settle by using clear gravel and optional geogrid.

C. Preparation: Ensure there is a water-permeable substrate. Tape off adjoining surfaces not to be affected. Clean and dry aggregate before using PROFI-DEKO. NOTE: wet or dirty aggregate will negatively affect the finished result!

D. Cleaning if Required: Ensure stone is clean before use, dirty aggregate will negatively effect the end result. Contact a ROMEX rep to determine the best way to clean your stone.

E. Mixing: Follow the mixing ratio in the consumption table, typically for ¼” clean aggregate mix approx. 150 - 160 lbs stone with each set of Profi Deko. Pour clean and dry gravel into the mixer. Slowly add the two-component resin while mixing for at least 4 minutes.

F. Application: Pour the mix onto the prepared surface. Disperse if necessary and level to at least 30 mm | 1 1/4” (depending on expected loads and substrate condition). Smoothen and level using screeds, magnesium trowels and smoothing trowels. Smooth the surface, ensuring good light compaction and avoiding impurities. Paint thinner or soap and water in a squirt bottle should be applied periodically to the tools during installation to keep them clean. The mixer should be periodically cleaned to prevent build-up on hot days, paint thinner and some clean stone is a great way to keep the mixer clean every 1- 2 hours.

G. Subsequent Treatment: Protect the freshly jointed surface from rain for 12-24 hours. Do not lay the rain protection layer directly onto the surface, a raised cover must be utilized, if that is not possible the project should not happen until the right conditions present themselves. For heavy-use or commercial surfaces, ensure a minimum surface depth of 5 cm I 2” After hardening or the following day, roll ROMEX® - PROFI-DEKO undiluted over the surface using a paintbrush or roller for extra strength. A future topcoat may be needed depending on the surface use with consumption of approx. 200-300 ml/m² | 0.04-0.06 lbs/sqft or around 150 sq ft/ full set of resin. A top coat should be considered every 3 years depending on the use of the space and site specifics.

H. Important Notes: Test a sample surface if uncertain. Ensure washed gravel is completely clean and dry to avoid loss of strength due to dust or dampness. Use ROMEX-approved aggregate and call before you install.

2.3 EXAMINATION

A. Examine areas where the Work of this Section will be performed for compliance with requirements and conditions affecting installation and performance.
   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel,

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paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within the work area.

2. Verify that final grades are completed in accordance with the drawings.

B. Proceed with installation only after unsatisfactory conditions have been corrected and approved by Project Manager.

2.4 QUALITY CONTROL

A. Mock-up: Provide field constructed sample installation of crushed stone paving, and prepared subgrade.

1. Mock-up to be ten foot (10') x ten foot (10') and located where directed by Construction Manager. Mock-up shall include proposed edge and banding, and surface stabilization if specified.
2. Project Manager shall review mock up within forty eight (48) hours of notification by the contractor.
3. Make necessary adjustments as directed by Project Manager.
4. Obtain approval from Project Manager before proceeding with the Work.
5. Retain and protect mock-up during construction as a standard for judging completed crushed stone paving work. Do not remove or destroy mock-up until work is completed.
6. Accepted and properly maintained sample installations may remain in completed work if approved in writing by Project Manager.
7. All work shall match accepted field mock-up.

2.5 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, turf areas, existing landscape areas, and trees from damage.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of

C. Install edging of type and in locations shown on drawings. Obtain acceptance of layout by Project Manager before excavating or installing. Make minor adjustments as required.

2.6 PLACEMENT OF CRUSHED STONE PAVING

A. Cut earthwork to width of trail/area to receive crusher fines paving to approximate depth section as specified on the Contract Drawings. Remove, haul and dispose of excess material off site, or use on-site with approval of Project Manager.

B. Complete excavation required in sub-grade before fine grading and final compaction of sub-grade is performed. Extend sub-grade compaction one foot (1') beyond proposed edge of crushed stone paving or as indicated on drawings.

1. Where earth moving is required the sub-grade shall be compacted to ninety five percent (95%) standard proctor within two percent (2%) of the optimum moisture.
2. Keep areas being graded or compacted shaped and drained during construction. Ruts greater than or equal to 1 inch deep in sub-grade shall be graded out and reshaped as required, and re-compacted before crushed stone paving placement.

C. Prior to placement of Crushed Stone Paving material, the sub-grade shall be proof rolled. Where soft spots are detected, scarify subgrade beneath Crushed Stone Paving trail to a

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minimum of six inch (6") depth. Moisture treat and compact to a minimum ninety five percent (95%) proctor density as determined by ASTM D698 or AASHTO T-99. Take moisture density tests every two hundred fifty (250) lineal feet of trail or proof roll. Treat and compact sub-grade, leaving it 5-inches below final grade for placement of Crushed Stone Paving. Compact material and retest by proof rolling to achieve approval of Project Manager.

D. Install crushed stone paving only after excavation and construction work which might injure it have been completed, and after edging has been completely installed on the compacted sub-grade. Install crushed stone paving, over compacted base course in areas indicated on plan.

E. Spread crushed stone evenly to fifty percent (50%) of specified depth. Avoid segregation of aggregate and contamination with lower courses or sub-grade.

F. Compact to ninety five percent (95%) of maximum density as determined by ASTM D1557.
   1. Maintain surface course moisture content within plus/minus three percent (± 3%) of optimum. Add water to quarry fines paving as required to achieve optimum moisture content and a uniform, compacted surface conforming to the finish grades indicated.
   2. Compact areas inaccessible to rolling by mechanical tamping.

G. Protect crushed stone paving from soil or other contaminates during and following installation.

H. Spread and compact additional crushed stone paving to achieve the required minimum compacted thickness. Compact per 3.3.F above.

2.7 PLACEMENT OF STABILIZED CRUSHED STONE PAVING

A. Do not allow traffic on stabilized crushed stone paving for two days.

2.8 MAINTENANCE AND REPAIRS:

A. Crusher Fines Paving:
   1. Areas that do not compact, become eroded or are degraded in visual quality and/or performance as determined by the Project Manager are to be removed and/or repaired. Obtain approval of repair methods from Project Manager prior to affecting repairs.

B. Stabilized Crusher Fines Paving:
   1. To repair, excavate damaged area leaving a minimum one inch depth of existing stabilized crushed stone paving. Apply stabilized crusher fines to existing surface as described above. Compact per 3.3.F above.
   2. Do not allow traffic on repaired stabilized crushed stone paving for two days or until paving has fully cured.

2.9 CLEANUP AND PROTECTION

A. All areas shall be clean at the end of each workday.

B. The contractor shall maintain protection during installation, curing, and maintenance periods.
   1. Erect temporary fencing or barricades and warning signs as required protecting newly installed Crushed Stone Paving areas from traffic, other trades, and trespassers. Maintain fencing and barricades throughout initial maintenance period and remove with approval of Project Manager.

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C. Project completion: All debris, soil, trash, and excavated and/or stripped material resulting from Crushed Stone Paving operations and unsuitable for or in excess of requirements for completing work of this Section shall be disposed of off-site.

D. Maintain protection during installation and maintenance periods. See Division 1. Treat, repair or replace damaged work as required.

2.10 QUALITY ASSURANCE

A. Refer to Division 1 Section “Quality Assurance”.

END OF SECTION 32 15 40

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SECTION 323119 - DECORATIVE METAL FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Decorative steel fences.

B. Related Requirements:

   1. **Section 033000 "Cast-in-Place Concrete"**

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For gates. Include plans, elevations, sections, details, and attachments to other work.

   1. Include diagrams for power, signal, and control wiring.

C. Samples: For each fence material and for each color specified.

   1. Provide Samples **12 inches** in length for linear materials.
   2. Provide Samples **12 inches** square for **bar grating and sheet or plate materials**.

1.4 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

B. Product Test Reports: For decorative metallic-coated-steel tubular picket fences, including finish, indicating compliance with referenced standard **and other specified requirements**.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

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1. Include 8’-0"

2. length of fence complying with requirements.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Lightning-Protection System: Maximum grounding-resistance value of 25 ohms under normal dry conditions.

2.2 DECORATIVE STEEL FENCES

A. Decorative Steel Fences: Fences made from steel tubing, **bars** and shapes**, hot-dip galvanized**.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide **product indicated on Drawings** or comparable product for approval by landscape architect.

B. Posts: Square steel tubing.

   1. Line Posts: Per Details
   2. End and Corner Posts: Per Details

C. Post Caps: Per Details

D. Rails: Per Details

E. Infill: Per Details

F. Fasteners: Stainless-steel carriage bolts and **tamperproof** nuts.

G. Fabrication: Assemble fences into sections by welding pickets to rails.

   1. Fabricate sections with clips welded to rails for field fastening to posts.
   2. Drill posts and clips for fasteners before finishing to maximum extent possible.

H. Fabrication: Fabricate bar grating infill into sections of size indicated.

   1. Fabricate rails with clips welded to rails for field fastening to posts.
   2. Drill posts and bar grating for fasteners before finishing to maximum extent possible.

I. Finish exposed welds to comply with NOMMA Guideline 1, **Finish #2 - completely sanded joint, some undercutting and pinholes okay**

J. Galvanizing: For items other than hardware that are indicated to be galvanized, hot-dip galvanize to comply with ASTM A 123/A 123M. For hardware items, hot-dip galvanize to comply with ASTM A 153/A 153M.

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1. Hot-dip galvanize posts **and rails**.
2. Hot-dip galvanize rail and picket assemblies after fabrication.
3. Hot-dip galvanize bar grating infill after fabrication.
4. Hot-dip galvanize custom-design rail and infill assemblies after fabrication.

K. Finish for Bar Grating Infill: Powder coating.

L. Finish for Steel Items: **Primed Shop painted or High-performance coating**.

M. Finish for Metallic-Coated-Steel Items: **High-performance coating**

2.3 STEEL AND IRON

A. Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Bars (Pickets): Hot-rolled, carbon steel complying with ASTM A 29/A 29M, Grade 1010.

C. Tubing: ASTM A 500/A 500M, cold-formed steel tubing.

D. Bar Grating: NAAMM MBG 531.

1. Bars: Hot-rolled steel strip, ASTM A 1011/A 1011M, Commercial Steel, Type B.
2. Wire Rods: ASTM A 510 (ASTM A 510M).

E. Uncoated Steel Sheet: **Hot-rolled steel sheet, ASTM A 1011/A 1011M, Structural Steel, Grade 45 (Grade 310) or cold-rolled steel sheet, ASTM A 1008/A 1008M, Structural Steel, Grade 50 (Grade 340)**.

F. Galvanized-Steel Sheet: ASTM A 653/A 653M, structural quality, Grade 50 (Grade 340), with [**G90 (Z275)**] [**G60 (Z180)**] coating.

G. Aluminum-Zinc, Alloy-Coated Steel Sheet: ASTM A 792/A 792M, structural quality, Grade 50 (Grade 340), with AZ60 (AZM180) coating.

H. Castings: Either gray or malleable iron unless otherwise indicated.

1. Gray Iron: ASTM A 48/A 48M, Class 30.
2. Malleable Iron: ASTM A 47/A 47M.

2.4 COATING MATERIALS

A. Shop Primers for Steel: Provide primers that comply with **Section 099113 "Exterior Painting."**

B. Shop Primer for Steel: Manufacturer's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

C. Epoxy Zinc-Rich Primer for Uncoated Steel: Complying with MPI #20 and compatible with coating specified to be applied over it.

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D. Epoxy Primer for Galvanized Steel: Epoxy primer recommended in writing by topcoat manufacturer.

E. Epoxy Intermediate Coat for Uncoated Steel: Complying with MPI #77 and compatible with primer and topcoat.

F. Intermediate Coat for Uncoated Steel: Epoxy or polyurethane intermediate recommended in writing by primer and topcoat manufacturer.

G. Polyurethane **Intermediate Coat and** Topcoat: Complying with MPI #72 and compatible with undercoat.

2.5 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

1. For aluminum, provide type and alloy as recommended by producer of metal to be welded and as required for strength and compatibility in fabricated items.

B. Concrete: Normal-weight, air-entrained, ready-mix concrete complying with requirements in Section 033000 "Cast-in-Place Concrete" with a minimum 28-day compressive strength of 3000 psi (20 MPa), 3-inch (75-mm) slump, and 1-inch (25-mm) maximum aggregate size.

C. Nonshrink Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M and specifically recommended by manufacturer for exterior applications.

2.6 GROUNDING MATERIALS

A. Grounding Conductors: Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.

1. Material above Finished Grade: **Copper**
2. Material on or below Finished Grade: Copper.
3. Bonding Jumpers: Braided copper tape, 1 inch (25 mm) wide, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.

B. Grounding Connectors and Grounding Rods: Comply with UL 467.

1. Connectors for Below-Grade Use: Exothermic-welded type.
2. Grounding Rods: Copper-clad steel.

a. Size: 5/8 by 96 inches (16 by 2440 mm).

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2.7 STEEL FINISHES

A. Surface Preparation: Clean surfaces according to **SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning**

1. After cleaning, apply a conversion coating compatible with the organic coating to be applied over it.

B. Powder Coating: Immediately after cleaning, apply two-coat finish consisting of epoxy primer and TGIC polyester topcoat, with a minimum total dry film thickness of not less than 8 mils (0.20 mm). Comply with coating manufacturer's written instructions.

1. Color and Gloss: **As indicated by manufacturer's designations**

C. Primer Application: Apply zinc-rich epoxy primer immediately after cleaning, to provide a minimum dry film thickness of 2 mils (0.05 mm) per applied coat, to surfaces that are exposed after assembly and installation, and to concealed surfaces.

D. Shop-Painted Finish: Comply with **Section 099113 "Exterior Painting."**

E. High-Performance Coating: Apply intermediate and polyurethane topcoats to prime-coated surfaces. Comply with coating manufacturer's written instructions and with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting. Apply at spreading rates recommended by coating manufacturer.

1. Match approved Samples for color, texture, and coverage. Remove and refinish or recoat work that does not comply with specified requirements.

2.8 METALLIC-COATED-STEEL FINISHES

A. Galvanized Finish: Clean welds, mechanical connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.

B. Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a **zinc-phosphate** conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.

C. Powder Coating: Immediately after cleaning and pretreating, apply TGIC polyester powder-coat finish, with a minimum dry film thickness of 2 mils (0.05 mm).

1. Color and Gloss: **As indicated by manufacturer's designations**

D. Powder Coating: Immediately after cleaning and pretreating, apply two-coat finish consisting of **zinc-rich** epoxy prime coat and TGIC polyester topcoat, with a minimum dry film thickness of 2 mils (0.05 mm) for topcoat. Comply with coating manufacturer's written instructions to achieve a minimum total dry film thickness of 4 mils (0.10 mm).

1. Color and Gloss: **As indicated by manufacturer's designations**

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E. High-Performance Coating: Apply epoxy primer, polyurethane intermediate coat, and polyurethane topcoat to prepared surfaces. Comply with coating manufacturer's written instructions and with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting. Apply at spreading rates recommended by coating manufacturer.

F. Match approved Samples for color, texture, and coverage. Remove and refinish or recoat work that does not comply with specified requirements.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install fences by setting posts as indicated and fastening rails and infill panels to posts. **Peen threads of bolts after assembly to prevent removal.**

B. Post Excavation: Excavate holes to a diameter of not less than 4 times post size and a depth of not less than 24 inches plus 3 inches for each foot or fraction of a foot that fence height exceeds 4 feet.

C. Post Setting: Set posts **in concrete with mechanical anchors by mechanically driving into soil**] at indicated spacing into firm, undisturbed soil.

1. Posts Set in Concrete: Extend post to within 6 inches of specified excavation depth, but not closer than 3 inches to bottom of concrete.
2. Space posts uniformly per details.

D. Install gates level, plumb, and secure for full opening without interference. Attach hardware using tamper-resistant or concealed means. Adjust hardware for smooth operation and lubricate where necessary.

END OF SECTION 323119

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SECTION 325200 – LANDSCAPE SYNTHETIC TURF

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Synthetic turf at play

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified.

C. Samples for Verification: For each type of synthetic turf, supply 12”x12” sample for approval.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: Include in maintenance manuals.

PART 2 - PRODUCTS

2.1 SYNTHETIC TURF AT PLAY AREA

A. Basis of Design Manufacturer: Artificial Grass superstore. 221 E. Willis Rd. Bldg A #2, Chandler, AZ 82586

B. Acceptable Product: Kid Play 60

2.2 GENERAL FINISH REQUIREMENTS

A. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining turf rolls are not acceptable.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, installation tolerances, and other conditions affecting performance of the Work.

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B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated.

END OF SECTION 325200

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SECTION 328400 - PLANTING IRRIGATION

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product data and Shop Drawings showing sprinkler layout and flow characteristics. Include wiring diagrams.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Design 100 percent water-coverage irrigation system for lawns and exterior plants indicated.

B. Minimum System Pressure Rating: 150 psig.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 PIPES AND FITTINGS

A. Pipe Materials: PE, ASTM F 771; PE 3408 compound; SIDR 15.

1. Insert Fittings: ASTM D 2609, nylon or propylene plastic.

B. Pipe Materials: PVC pipe, ASTM D 2241, PVC 1120, SDR 26.

1. Fittings: PVC plastic pipe fittings, ASTM D 2467, Schedule 80, socket type with ASTM F 656 primer and ASTM D 2564 solvent cement.

2.3 VALVES

A. Curb Valves:

1. Description: Bronze body, ground-key plug or ball with wide tee head.
2. Curb-Valve Casing: Similar to AWWA M44 for cast-iron valve casings.

B. Plastic Ball Valves:

1. Description: MSS SP-122, Full Port with socket or threaded ends.

C. Bronze Gate Valves:

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D. Description: MSS SP-80, Type 2, solid bronze wedge; nonrising bronze stem; Class 125 with integral seat, screw-in bonnet, and malleable-iron, bronze, or aluminum handwheel.

E. Water Control Valves:

1. Description: Cast- or ductile-iron body globe valve, AWWA C550 or FDA-approved interior epoxy coating; or stainless-steel body.

F. Bronze Automatic Control Valves:

1. Description: Cast-bronze body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid.

G. Plastic Automatic Control Valves:

1. Description: Molded-plastic body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid.

H. Automatic Drain Valves: Spring-loaded-ball type of corrosion-resistant construction and designed to open for drainage if line pressure drops below 2-1/2 to 3 psig.

I. Antisiphon, Pressure-Type Vacuum Breakers: Spring-loaded check valve.

J. Pressure Regulators: Single-seated, direct-operated type with integral Y-pattern strainer.

2.4 QUICK COUPLERS

A. Two-piece assembly, with coupler water-seal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.

2.5 SPRINKLERS

A. Metal, Surface Spray Sprinklers:

1. Sprinklers: Brass housing; flush, surface, fixed pattern, with screw-type flow adjustment.

B. Plastic, Surface Spray Sprinklers:

1. Sprinklers: Plastic housing; flush, surface, fixed pattern, with screw-type flow adjustment.

C. Metal, Exposed, Impact-Drive Rotary Sprinklers:

1. Impact drive, full circle and part circle as indicated.

D. Plastic, Exposed, Impact-Drive Rotary Sprinklers:

1. Impact drive, full circle and part circle as indicated.

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E. Plastic, Pop-up, Gear-Drive Rotary Sprinklers:

1. Gear drive, full-circle and adjustable part-circle type.

F. Metal, Surface, Pop-up Spray Sprinklers:

1. Fixed pattern, with screw-type flow adjustment and stainless-steel spring.

G. Plastic, Surface, Pop-up Spray Sprinklers:

1. Fixed pattern, with screw-type flow adjustment and stainless-steel spring.

H. Metal Shrub Sprinklers:

1. Fixed pattern, with screw-type flow adjustment.

I. Plastic Shrub Sprinklers:

1. Fixed pattern, with screw-type flow adjustment.

2.6 DRIP IRRIGATION SPECIALTIES

A. Emitters: Plastic body with multiple outlets, to deliver flow at approximately 20 psig of 0.5 gph, 1 gph, and 2 gph

B. Drip Tubes: Flexible PVC, NPS ½, NPS ¾, and NPS 1.

2.7 CONTROLLERS

A. Description: Automatic low-voltage control system made for control of irrigation-system automatic control valves. Controller operates on 120-V ac; provides 24-V ac power to control valves.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install components having pressure rating equal to or greater than system operating pressure.

B. Lay piping on solid subbase, uniformly sloped without humps or depressions. Slope circuit piping down toward drain valve a minimum of 0.4 percent.

C. Drain Pockets: Excavate to sizes indicated. Backfill with cleaned gravel or crushed stone to 12 inches below grade. Cover with asphalt-saturated felt and excavated material.

D. Minimum Cover: Provide the following minimum cover over top of buried piping:

1. Pressure Piping: Refer to City of Chandler details.

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2. Circuit Piping: Refer to City of Chandler details.
3. Drain Piping: Refer to City of Chandler details.
4. Sleeves: Refer to City of Chandler details .
5. Install water meters in meter boxes, with shutoff valve on meter inlet. Include valve on meter outlet and valved bypass around meter.

E. Install pressure regulators with shutoff valve and strainer on inlet and pressure gage on outlet. Install shutoff valve on outlet and valved bypass.

F. Sprinklers: Flush circuit piping with full head of water and install sprinklers after hydrostatic test is completed.

END OF SECTION 328400

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SECTION 329113 - SOIL PREPARATION

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Section includes the composition and mixing of planting soils cited in other Sections.

B. Definitions:

1. Planting Soil: Existing soil modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
2. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

C. Submittals: Product data and bulk Samples for each type of product.

PART 2 - PRODUCTS

2.1 PLANTING SOILS SPECIFIED BY COMPOSITION

A. Planting-Soil Type: Refer to subsurface materials sheets.

2.2 MATERIALS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent; in the form of ground dolomitic limestone, calcitic limestone, or mollusk shells.

B. Sulfur: Containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing a No. 6 sieve and a maximum of 10 percent passing through a No. 40 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Agricultural Gypsum: Minimum 90 percent calcium sulfate, ground with 90 percent passing a No. 50 sieve.

E. Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C 33.

F. Compost: Well-composted, stable, and weed-free organic matter produced by composting and bearing U.S. Composting Council's "Seal of Testing Assurance."

G. Wood Derivatives: Shredded and composted, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.

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H. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of [20] [33] [50] percent available phosphoric acid.

I. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen; composition resulting in 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight:

J. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium; composed of 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Place planting soil and fertilizers according to requirements in other Specification Sections.

B. Unacceptable Materials: Clean soil of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth. Clean soil to contain a maximum of 8 percent by dry weight of stones, roots, plants, sod, clay lumps, and pockets of coarse sand.

3.2 PLACING AND MIXING PLANTING SOIL

A. Mixing: Blend unamended soil with amendments to produce full depth of required planting soil with uniform texture. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Compaction: Compact each blended lift of planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D 698 unless otherwise indicated.

C. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

D. Protect areas of in-place soil from additional compaction, disturbance, and contamination.

E. Remove surplus soil and waste material off Owner's property unless otherwise indicated.

END OF SECTION 329113

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SECTION 329200 - TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Sodding.

B. Related Sections:

   1. Section 311000 "Site Clearing" for topsoil stripping and stockpiling.
   2. Section 328400 "Planting Irrigation " for turf irrigation.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

C. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

D. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

E. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

F. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.

G. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

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H. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this Project.

1.5 INFORMATIONAL SUBMITTALS

A. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of supplier.

B. Qualification Data: For qualified landscape Installer.

C. Product Certificates: For soil amendments and fertilizers, from manufacturer.

D. Material Test Reports: For standardized ASTM D 5268 topsoil, existing native surface topsoil, existing in-place surface soil and imported or manufactured topsoil.

E. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of turf during a calendar year. Submit before expiration of required initial maintenance periods.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: Five years' experience in turf installation in addition to requirements in Section 014000 "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Installer's field supervisor have certification in one of the following categories from the Professional Landcare Network:

a. Certified Landscape Technician - Exterior, with installation, maintenance, irrigation specialty area(s), designated CLT-Exterior.
b. Certified Turfgrass Professional, designated CTP.

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c. Certified Turfgrass Professional of Cool Season Lawns, designated CTP-CSL.

5. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.
6. Pesticide Applicator: State licensed, commercial.

B. Soil-Testing Laboratory Qualifications: An independent laboratory or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Soil Analysis: or each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of the soil.

1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
2. The soil-testing laboratory shall oversee soil sampling, with depth, location, and number of samples to be taken per instructions from Architect. A minimum of [three] <Insert number> representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
3. Report suitability of tested soil for turf growth.

a. Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. (92.9 sq. m) or volume per cu. yd. (0.76 cu. m) for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

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1.8 PROJECT CONDITIONS

A. Planting Restrictions: Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

1.9 MAINTENANCE SERVICE

A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:

1. Sodded Turf: 60 days from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 TURFGRASS SOD

A. Sod Quality: **Certified Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects**, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.

B. Species: Tahoma 31 Bermuda Grass.

2.2 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

1. Class: T, with a minimum of 99 percent passing through No. 8 (2.36-mm) sieve and a minimum of 75 percent passing through No. 60 (0.25-mm) sieve.
2. Provide lime in form of ground dolomitic limestone.

B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, and with a minimum of 99 percent passing through No. 6 (3.35-mm) sieve and a maximum of 10 percent passing through No. 40 (0.425-mm) sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Aluminum Sulfate: Commercial grade, unadulterated.

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E. Perlite: Horticultural perlite, soil amendment grade.

F. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 (0.30-mm) sieve.

G. Sand: Clean, washed, natural or manufactured, and free of toxic materials.

H. Diatomaceous Earth: Calcined, 90 percent silica, with approximately 140 percent water absorption capacity by weight.

I. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

2.3 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch (25-mm) sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.
2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or of granular texture, with a pH range of 3.4 to 4.8.

C. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent.

D. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.

E. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.4 FERTILIZERS

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 1 percent nitrogen and 10 percent phosphoric acid.

B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

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1. Composition: 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.5 PLANTING SOILS

A. Planting Soil: Existing, in-place surface soil. Verify suitability of existing surface soil to produce viable planting soil. Remove stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix surface soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

1. Ratio of Loose Compost to Surface Soil by Volume: 1:4
2. Weight of Sulfur per 1000 Sq. Ft. (92.9 Sq. m): 5 lbs.
3. Weight of Agricultural Gypsum per 1000 Sq. Ft. (92.9 Sq. m): 5 lbs.
4. Weight of Ammonium phosphate per 1000 Sq. Ft. (92.9 Sq. m): 5 lbs.

B. Planting Soil: Imported topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from agricultural land.

1. Additional Properties of Imported Topsoil or Manufactured Topsoil: Screened and free of stones 1 inch (25 mm) or larger in any dimension; free of roots, plants, sod, clods, clay lumps, pockets of coarse sand, paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials harmful to plant growth; free of obnoxious weeds and invasive plants including quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and bromegrass; not infested with nematodes, grubs, other pests, pest eggs, or other undesirable organisms and disease-causing plant pathogens; friable and with sufficient structure to give good tilth and aeration. Continuous, air-filled, pore-space content on a volume/volume basis shall be at least 15 percent when moisture is present at field capacity. Soil shall have a field capacity of at least 15 percent on a dry weight basis.
2. Mix imported topsoil or manufactured topsoil with the following soil amendments[and fertilizers] in the following quantities to produce planting soil:

a. Ratio of Loose Compost to Topsoil by Volume: 1:4
b. Weight of Sulfur per 1000 Sq. Ft. (92.9 Sq. m): 5 lbs.
c. Weight of Agricultural Gypsum per 1000 Sq. Ft. (92.9 Sq. m): 5 lbs.
d. Weight of Ammonium phosphate per 1000 Sq. Ft. (92.9 Sq. m): <Insert weight>.

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2.6 PESTICIDES

A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
1. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION

A. Limit turf subgrade preparation to areas to be planted.

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B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 8 inches (200 mm). Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Apply Gypsum, Sulfur, and Ammonium Phosphate fertilizer directly to subgrade before loosening.
2. Thoroughly blend planting soil off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.

    a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
    b. Mix lime with dry soil before mixing fertilizer.

3. Spread planting soil to a depth of 6 inches (150 mm) minimum but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

    a. Spread approximately 1/2 the thickness of planting soil over loosened subgrade. Mix thoroughly into top 4 inches (100 mm) of subgrade. Spread remainder of planting soil.
    b. Reduce elevation of planting soil to allow for soil thickness of sod.

4. Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, trash, and other extraneous matter.
5. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch (13 mm) of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

D. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

E. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 PREPARATION FOR GRASS-PAVING MATERIALS

A. Reduce subgrade elevation soil to allow for thickness of grass-paving system. Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade so that installed paving is within plus or minus 1/2 inch (13 mm) of finish elevation. Roll and rake, remove ridges, and fill depressions.

B. Install base course and sand course as recommended by paving-material manufacturer for site conditions; comply with details shown on Drawings. Compact according to paving-material manufacturer's written instructions.

C. Install paving mat and fasten according to paving-material manufacturer's written instructions.

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D. Before planting, fill cells of paving mat with planting soil and compact according to manufacturer's written instructions.

E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.5 SODDING

A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across angle of slopes exceeding 1:3.
2. Anchor sod on slopes exceeding 1:6 with wood pegs or steel staples spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.

C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches (38 mm) below sod.

3.6 TURF MAINTENANCE

A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches (100 mm).

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water turf with fine spray at a minimum rate of 1 inch (25 mm) per week unless rainfall precipitation is adequate.

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C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:
   1. Mow bermudagrass to a height of 1 inch (13 to 25 mm).

D. Turf Postfertilization: Apply fertilizer after initial mowing and when grass is dry.

   1. Use fertilizer that will provide actual nitrogen of at least 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) to turf area.

3.7 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Landscape Architect:
   1. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.8 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.9 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

3.10 Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION 329200

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SECTION 329300 - PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

A. Section Includes:
1. Plants
2. Planting Soils
3. Tree Stabilization
4. Mulches
5. Landscape Edings
6. Tree Grates

B. Related Sections:
1. Section 01 56 39 “Temporary Tree and Plant Protection” for prote4cting, trimming, pruning, repairing, and replacing existing trees to remain that interfere with, or are affected by, execution of the Work.
2. Section 12 93 00 “Site Furnishings” for exterior unit planters.
3. Section 31 10 00 “Site Clearing” for protection of existing trees and plantings, topsoil stripping and stockpiling, and site clearing.
4. Section 312000 "Earth Moving" for excavation, filling, and rough grading and for subsurface aggregate drainage and drainage backfill materials.
5. Section 334600 "Subdrainage" for below-grade drainage of landscaped areas, paved areas, and wall perimeters.

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI Z60.1 for type and size of plant required.

C. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well□established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

D. Finish Grade: Elevation of finished surface of planting soil.

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E. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

F. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

G. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

H. Planting Area: Areas to be planted.

I. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

J. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

K. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots, the area of transition between the root system and the stem or trunk.

L. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

M. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.

N. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated, including soils.
   1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
   2. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to the Project.
   3. Plant Photographs: Include color photographs in digital format of each required species and size of plant material as it will be furnished to the Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 20 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.
   4. Samples for Verification: For each of the following:

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a. Organic Compost Mulch: 1-quart (1-liter) volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
b. Mineral Mulch: 5 lb. (2.5 kg) of each mineral mulch required, in sealed plastic bags labeled with source of mulch. Sample shall be typical of the lot of material to be delivered and installed on the site; provide an accurate indication of color, texture, and makeup of the material.
c. e. Root Barrier: Width of panel by 12 inches (300 mm)

1.5 INFORMATION SUBMITTALS

A. Qualification Data: For qualified landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:
1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
3. Material Test Reports: For existing native surface topsoil and imported or manufactured topsoil.
4. Retain first paragraph below if Owner's personnel will provide maintenance after plants are established and if Contractor's recommendations will be sought.
5. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before start of required maintenance periods
6. Warranty: Sample of special warranty

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.
1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: Five years' experience in landscape installation in addition to requirements in Section 014000 "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Installer's field supervisor shall have certification in all of the following categories from the Professional Landcare Network:
a. Certified Landscape Technician - Exterior, with installation, maintenance, and irrigation specialty area(s), designated CLT-Exterior.
b. Certified Landscape Technician - Interior, designated CLT-Interior.
c. Certified Ornamental Landscape Professional, designated COLP.

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B. Soil-Testing Laboratory Qualifications: An independent or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of the soil.
   1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
   2. The soil-testing laboratory shall oversee soil sampling; with depth, location, and number of samples to be taken per instructions from Architect. A minimum of three representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
   3. Report suitability of tested soil for plant growth.
      a. Based upon the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. (92.9 sq. m) or volume per cu. yd. (0.76 cu. m) for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
      b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

D. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.
   1. Selection of plants purchased under allowances will be made by Architect, who will tag plants at their place of growth before they are prepared for transplanting.

E. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.
   1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches (150 mm) above the root flare for trees up to 4-inch (100-mm) caliper size, and 12 inches (300 mm) above the root flare for larger sizes.
   2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

F. Plant Material Observation: Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
   1. Notify Architect of sources of planting materials 30 days in advance of delivery to site.

G. Preinstallation Conference: Conduct conference at Project site.

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1.7 DEVLIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

B. Bulk Materials:
   1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
   2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
   3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

C. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

D. Handle planting stock by root ball.

E. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.
   1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
   2. Do not remove container-grown stock from containers before time of planting.
   3. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly-wet condition.

1.8 1.8 PROJECT CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:
   1. Notify Construction Manager no fewer than seven days in advance of proposed interruption of each service or utility.
   2. Do not proceed with interruption of services or utilities without Construction Manager's written permission.
   3. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be

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obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

C. Retain paragraph below if there are turf areas (lawns) or revise if contrary to planting schedule.

D. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.
1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.9 WARRANTY

A. A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
1. Failures include, but are not limited to, the following:
a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
b. Structural failures including plantings falling or blowing over.
c. Faulty performance of tree stabilization, edgings, and tree grates.
d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
2. Warranty Periods from Date of Substantial Completion:
a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
b. Ground Covers, Biennials, Perennials, and Other Plants: 6 months.
c. Annuals: 3 months.
3. Include the following remedial actions as a minimum:
a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

1.10 MAINTENANCE SERVICE

A. A. Initial Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.
1. 1. Maintenance Period: 90 days from date of Substantial Completion.

B. B. Initial Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.
1. Maintenance Period: 90 days from date of Substantial Completion.

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C. C. Continuing Maintenance Proposal: From Installer to Owner, in the form of a standard yearly (or other period) maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1 PLANT MATERIALS

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well□shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch (19 mm) in diameter; or with stem girdling roots will be rejected.
2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label each plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant as shown on Drawings.

E. If formal arrangements or consecutive order of plants is shown on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

2.2 FERTILIZERS AND MULCHES

A. Planting Tablets: Tightly compressed chip type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.

1. Size: **[5-gram] [10-gram] [21-gram] <Insert size>** tablets.
2. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

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B. Mineral Mulch: **Hard, durable stone, washed free of loam, sand, clay, and other foreign substances, of following type, size range, and color:**

1. Size Range: Refer to LM100 for size of all crushed stone and decomposed granite.
2. Color: Refer to LM100 for color of all crushed stone and decomposed granite.

2.3 PLANTING SOILS

A. Planting Soil: Existing, native surface topsoil formed under natural conditions with the duff layer retained during excavation process and stockpiled on-site. Verify suitability of native surface topsoil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
   1. Supplement with imported planting soil when quantities are insufficient
   2. Mix existing, native surface topsoil with the following soil amendments and fertilizers in the following quantities to produce planting soil
      a. Ratio of Loose Compost to Topsoil by Volume: [1:4].
      b. Ratio of Loose Wood Derivatives to Topsoil by Volume: 1:5.
      c. Weight of Sulfur per 1000 Sq. Ft. (92.9 Sq. m): 5 lbs.
      d. Weight of Agricultural Gypsum per 1000 Sq. Ft. (92.9 Sq. m): 5 lbs.
      e. Weight of Ammonium phosphate per 1000 Sq. Ft. (92.9 Sw. m): 5 lbs

B. Planting Soil: Existing, in-place surface soil. Verify suitability of existing surface soil to produce viable planting soil. Remove stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix surface soil with the following soil amendments and fertilizers in the following quantities to produce planting soil
   1. Ratio of Loose Compost to Surface Soil by Volume: 1:4.
   2. Ratio of Loose Wood Derivatives to Surface Soil by Volume: 1:5.
   3. Weight of Sulfur per 1000 Sq. Ft. (92.9 Sq. m): 5 lbs.
   4. Weight of Agricultural Gypsum per 1000 Sq. Ft. (92.9 Sq. m): 5 lbs.
   5. Weight of Ammonium phosphate per 1000 Sq. Ft. (92.9 Sq. m): 5 lbs

C. Planting Soil: Imported topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from agricultural land.
   1. Additional Properties of Imported Topsoil or Manufactured Topsoil: Screened and free of stones 1 inch (25 mm) or larger in any dimension; free of roots, plants, sod, clods, clay lumps, pockets of coarse sand, paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials harmful to plant growth; free of obnoxious weeds and invasive plants including quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and bromegrass; not infested with nematodes; grubs; or other pests, pest eggs, or other undesirable organisms and disease-causing plant pathogens; friable and with sufficient structure to give good tilth and aeration. Continuous, air-filled pore space content on a volume/volume basis shall be at least 15 percent when moisture is present at field capacity. Soil shall have a field capacity of at least 15 percent on a dry weight basis.
   2. Mix imported topsoil or manufactured topsoil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

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a. Ratio of Loose Compost to Topsoil by Volume: 1:4.
b. Ratio of Loose Wood Derivatives to Topsoil by Volume: 1:5
c. Weight of Sulfur per 1000 Sq. Ft. (92.9 Sq. m): 5 lbs.
d. d. Weight of Agricultural Gypsum per 1000 Sq. Ft. (92.9 Sq. m): 5 lbs.
e. e. Weight of Ammonium phosphate per 1000 Sq. Ft. (92.9 Sq. m): 5 lbs.

D. Structural Planting Soil

2.4 TREE GRATES

A. Tree Grates and Frames: ASTM A 48/A 48M, Class 35 (Class 250) or better, gray-iron castings of shape, pattern, and size indicated
1. Shape and Size: As Indicated on Details.
2. Finish: As Indicated on Details.
3. Color: As Indicated on Details.

2.5 PESTICIDES

A. General: Pesticide registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

2.6 TREE STAKING

2.7 LANDSCAPE EDINGS

A. Mortar Set Edge Pavers, Per Details.

B. Steel Edge, Per Details.

2.8 MISCELLANEOUS

A. Root Barrier: Black, molded, modular panels manufactured with 50 percent recycled polyethylene plastic with ultraviolet inhibitors, 85 mils (2.2 mm) thick, with vertical root deflecting ribs protruding 3/4 inch(19 mm) out from panel, and each panel 24 inches (610 mm) wide.
1. Manufacturer: Deep Root. info@deeproot.com 415 781 9700 (or equal)
2. Product: UB 36-2 (or equal)

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B. Antidesiccant Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

PART 3 - EXECUTION

3.1 3.1 EXAMINATION

A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.
   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
   2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
   3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
   4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Lay out plants at locations directed by Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

E. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
   1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

F. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

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3.3 3.3 PLANTING AREA ESTABLISHMENT

A. A. Loosen subgrade of planting areas to a minimum depth of 9 inches (200 mm). Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
   1. Apply Sulfur, Gypsum, and Ammonium Phosphate fertilizer directly to subgrade before loosening.
   2. Thoroughly blend planting soil, soil amendments and fertilizer.
      a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
      b. Mix lime with dry soil before mixing fertilizer.
   3. Spread planting soil to a depth of 9 inches (150 mm) but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

B. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

C. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 3.4 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are not acceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
   1. Excavate approximately three times as wide as ball diameter for container-grown stock.
   2. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
   3. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
   4. Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
   5. Maintain supervision of excavations during working hours.
   6. Keep excavations covered or otherwise protected when unattended by Installer's personnel.
   7. Retain subparagraph below if applicable.
   8. If drain tile is shown on Drawings or required under planting areas, excavate to top of porous backfill over tile.

B. Subsoil and topsoil removed from excavations may be used as planting soil.

C. Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

D. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

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E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 3.5 TREE, SHRUB, AND VINE PLANTING

A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soIl in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Set container-grown stock plumb and in center of planting pit or trench with root flare 1 inch (25 mm)above adjacent finish grades.
1. Use planting soil for backfill.
2. 2. Carefully remove root ball from container without damaging root ball or plant.
3. 3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Remove only dead, dying, or broken branches. Do not prune for shape.

E. When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.6 3.6 TREE, SHRUB, AND VINE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees, shrubs, and vines as directed by Architect.

C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

D. Do not apply pruning paint to wounds.

3.7 3.7 ROOT-BARRIER INSTALLATION

A. Install root barrier where trees are planted within 10 feet from utility lines and as shown on Drawings.

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B. Align root barrier vertically and run it linearly along and adjacent to the paving or other hardscape elements to be protected from invasive roots.

C. Install root barrier continuously for a distance of 60 inches 1500 mm in each direction from the tree trunk, for a total distance of 10 feet (3 m) per tree. If trees are spaced closer, use a single continuous piece of root barrier.
   1. Position top of root barrier flush with finish grade
   2. Overlap root barrier a minimum of 12 inches (300 mm) at joints.
   3. Do not distort or bend root barrier during construction activities.
   4. Do not install root barrier surrounding the root ball of tree.

3.8 PLANTING IN PLANTERS

A. Place a layer of drainage gravel at least 4 inches (100 mm) thick in bottom of planter. Cover bottom with filter fabric and wrap filter fabric 6 inches (150 mm) up on all sides. Duct tape along the entire top edge of the filter fabric, to secure the filter fabric against the sides during the soil-filling process.

B. Fill planter with planting soil. Place soil in lightly compacted layers to an elevation of 2 inches (50.8 mm) below top of planter, allowing natural settlement.

3.9 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated in even rows with triangular spacing.

B. Use planting soil for backfill.

C. Dig holes large enough to allow spreading of roots.

D. For rooted cutting plants supplied in flats, plant each in a manner that will minimally disturb the root system but to a depth not less than two nodes.

E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.10 PLANT AREA MULCHING

A. Mulch backfilled surfaces of planting areas and other areas indicated.
   1. Mineral Mulch in Planting Areas: Apply 3-inch (75-mm) average thickness of mineral mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches (75 mm) of trunks or stems.

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2. Wood Mulch in Planting Areas: Apply 4-inch (150-mm) average thickness of wood mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches (75 mm) of trunks or stems.

3.11 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.

B. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated past management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.12 3.12 PESTICIDE APPLICATION

A. A. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Pre-Emergent Herbicides (Selective and Non-Selective): Apply to tree, shrub, and ground-cover areas in accordance with manufacturer's written recommendations. Do not apply to seeded areas.

C. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already germinated weeds and in accordance with manufacturer's written recommendations.

3.13 3.13 CLEANUP AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.

B. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

C. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

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3.14 3.14 DISPOSAL

A. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION 329300

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SECTION 340 CONCRETE CURB, GUTTER, SIDEWALK, CURB RAMPS, DRIVEWAY AND ALLEY ENTRANCE

MAG Specification as written.
City of Chandler Supplemental Specification as written.

END OF SECTION 340

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

SECTION 345 ADJUSTING FRAMES, COVER, AND VALVE BOXES

MAG Specification as written.
City of Chandler Supplemental Specification as written.

END OF SECTION 345

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SECTION 350 REMOVAL OF EXISTING IMPROVEMENTS

350.1 DESCRIPTION:

Replace with the following:

The work shall consist of removal and disposal of various existing improvements, such as asphalt pavement, structures, pipes, conduits, concrete curbs and gutters, concrete sidewalk, concrete pads, and other items necessary for the accomplishment of the improvement.

END OF SECTION 350

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

SECTION 505 CONCRETE STRUCTURES

MAG Specification as written.

END OF SECTION 505

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

SECTION 601 TRENCH EXCAVATION, BACKFILLING AND COMPACTION

MAG Specification as written.
City of Chandler Supplemental Specification as written.

END OF SECTION 601

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

SECTION 610 WATER LINE CONSTRUCTION

City of Chandler Supplemental Specification as written.

610.16 MEASUREMENT AND PAYMENT:

Add the following:

(XX) 3” PVC Water Line: Measurement of and payment for 3” PVC water line shall be by the linear foot item furnished and installed, including fittings.

(XX) 2” PVC Water Line: Measurement of and payment for 2” PVC water line shall be by the linear foot item furnished and installed, including fittings and temporary cap.

(XX) 1” PVC Water Line: Measurement of and payment for 1” PVC water line shall be by the linear foot item furnished and installed, including fittings and temporary cap.

END OF SECTION 610

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

SECTION 615 SANITARY SEWER LINE CONSTRUCTION

615.17 MEASUREMENT AND PAYMENT:

Add the following:

(XX) 8” PVC SDR 35 Sewer Line: Measurement of and payment for 8” PVC SDR 35 sewer line shall be by the linear foot item furnished and installed, including fittings.

(XX) 6” PVC SDR 35 Sewer Line: Measurement of and payment for 6” PVC SDR 35 sewer line shall be by the linear foot item furnished and installed, including fittings.

(XX) 6” PVC Service Tap: Measurement of and payment for 6” PVC Service Tap shall be by for each item furnished and installed, including electronic ball markers.

Replace the following:

(C) Sanitary Sewer Cleanout:

Measurement of and payment for sewer cleanout shall be by for each item furnished and installed, including pipe, fittings, and frame and cover as called for on the plans and in accordance with the standard details.

END OF SECTION 615

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SECTION 618 STORM DRAIN CONSTRUCTION

MAG Specification as written.

END OF SECTION 618

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EXHIBIT D

ACCEPTED GMP/PRICE PROPOSAL

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

COST BREAKDOWN

Dr. A.J. Chandler Park - 90% GMP - Final

Est. Date: 11/12/2025

Item #	Division - Description/Scope Of Work	Refer.	Estimate Qty.	U/M	Unit Price	TOTALS
	01 30 Design & Engineering					
19.	Reproduction Costs - Plans/Specifications	Gen Requirements	1	ls	2,500.00	2,500.00
	01 30 Subtotal					**2,500.00**
	01 40 Permits/Develop. Fees/Utility Company Charges					
1.	ADEQ Dust Control Permit	Gen Requirements	1	ls	4,000.00	4,000.00
2.	SWPPP Notice of Intent & Review	Gen Requirements	1	ls	1,000.00	1,000.00
3.	Water Meter Fee - By Owner	Gen Requirements			By Owner	By Owner
	01 40 Subtotal					**5,000.00**
	01 70 Construction Cleanup					
1.	General Clean Up	Gen Requirements	1,460	hrs	35.00	51,100.00
	01 70 Subtotal					**51,100.00**
	02 21 Survey & Staking					
1.	Construction Field Staking & Willmeng Layout	Gen Requirements	1.00	ls	75,000.00	75,000.00
2.	Misc Ped Routing & Traffic Control	Gen Requirements	14.00	mos	3,500.00	49,000.00
3.	Construction Water Buy	Gen Requirements	5,500	mg	8.00	44,000.00
4.	Drone - Site	Gen Requirements	150	hrs	150.00	22,500.00
	02 21 Subtotal					**190,500.00**
	02 30 Materials Testing					
1.	Material Testing	Gen Requirements	1	ls	65,000.00	65,000.00
2.	Special Inspections	Gen Requirements	1	ls	10,000.00	10,000.00
	02 30 Subtotal					**75,000.00**
	02 40 Demolition					
1.	1 & 29 Demo - Curb, Curb/Gutter	Demo	2,125	lf	4.00	8,500.00
2.	2, 3, 5 & 33 Demo - Sidewalks, Ramp, Concrete Pads	Demo	6,362	sf	2.00	12,724.00
3.	4 Demo - Fountain Structure	Demo	623	sf	8.00	4,984.00
4.	6 Demo - Pavers	Demo	27,015	sf	1.00	27,015.00
5.	7 & 30 Demo - Light Pole/Base & Decorative Lights (Salvage)	Demo	42	ea	250.00	10,500.00
6.	8 Demo - Large Boulders	Demo	16	ea	250.00	4,000.00
7.	9 Demo - Striping	Demo	9,547	lf	0.25	2,386.75
8.	10 Demo - Trench Drain	Demo	549	lf	7.00	3,843.00
9.	11 Demo - Planter Pot	Demo	4	ea	500.00	2,000.00
10.	12 Demo - Remove Catch Basin	Demo	1	ea	100.00	100.00
11.	13 Demo - Retaining Wall	Demo	844	lf	5.00	4,220.00
12.	14 Demo - Feature Seat Walls	Demo	2,197	sf	3.00	6,591.00
13.	15 Demo - Signage	Demo	11	ea	500.00	5,500.00
14.	16 Demo - Waste Receptacles	Demo	13	ea	50.00	650.00
15.	17 Demo - Bollards	Demo	17	ea	100.00	1,700.00
16.	18 Demo - Buildings	Demo	2,616	sf	10.00	26,160.00
17.	19 Demo - Salvage Backflow Preventer	Demo	4	ea	300.00	1,200.00
18.	20 Demo - Fountain and associated piping	Demo	1,055	sf	5.00	5,275.00
19.	21 Demo - Shade Structures	Demo	7,896	sf	4.00	31,584.00
20.	22 Demo - Tower Structure	Demo	2	ea	7,400.00	14,800.00
21.	23 Demo - Remove and Salvage Water Bollard	Demo	4	ea	350.00	1,400.00
22.	24 Demo - Pump & Fountain Equipment	Demo	3	ea	500.00	1,500.00
23.	25 Demo - Demo Sewer line Cleanouts	Demo	3	ea	250.00	750.00
24.	26 Demo - Stairs/Hardscape	Demo	244	sf	3.00	732.00
25.	27 Demo - Remove and Salvage Parking Pavers	Demo			In Pavers	In Pavers
26.	28 Demo - Demo Sump Structure	Demo	1	ea	500.00	500.00
27.	35 - Demo - Remove Junction Box	Demo	24	ea	50.00	1,200.00
28.	36 - Demo - Remove Elec. Cabinet	Demo	2	ea	1,000.00	2,000.00
29.	37 - Demo - Remove Water Meter	Demo	1	ea	500.00	500.00
30.	40 - Demo - Flag Pole	Demo	1	ea	1,000.00	1,000.00
31.	Demo Trees	Demo	17	ea	200.00	3,400.00
32.	Mobilization	Demo	1	ls	Included	Included
	Textura	Demo	$186,714.75	%	0.22%	410.77
	02 40 Subtotal					**187,125.52**

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COST BREAKDOWN

Dr. A.J. Chandler Park - 90% GMP - Final

Est. Date: 11/12/2025

Item #	Division - Description/Scope Of Work	Refer.	Estimate Qty.	U/M	Unit Price	TOTALS
	31 10 Earthwork					
1.	Site Clearing	Earthwork	2.59	acre	2,000.00	5,181.36
2.	Earthwork - Cuts / Fills - Average of 3' on entire site	Earthwork	8,359	cy	8.50	71,053.70
3.	Soil Export	Earthwork	6,580	cy	20.00	131,600.00
4.	Footing Over excavation	Earthwork	480	cy	15.00	7,200.00
5.	Rough & Finish Grade +/-1 tenth - Entire Site	Earthwork	112,850	sf	0.65	73,352.50
6.	Traffic Control	Earthwork	2	month	5,000.00	10,000.00
7.	Mobilization	Earthwork	10	ea	1,500.00	15,000.00
8.	Off-duty Officer	Earthwork			Excluded	Excluded
	Textura	Earthwork	$313,387.56	%	0.22%	689.45
	31 10 Subtotal					**314,077.01**
	31 25 SWPP Plan & Implementation					
1.	SWPP Plan Implementation	SWPPP	1	ls	30,000.00	30,000.00
2.	Dust Control & SWPPP Maintentance	SWPPP	14	month	5,000.00	70,000.00
3.	Temp Fencing & Screening (site perimeter)	SWPPP	2,400	lf	25.00	60,000.00
	31 25 Subtotal					**160,000.00**
	31 31 Termite Pretreat					
1.	Termite Pretreat	Earthwork	2,592	sf	1.00	2,592.00
	Textura	Earthwork			Included	Included
	31 31 Subtotal					**2,592.00**
	32 10 Paving & Striping					
1.	Pavement Striping @ new parking stalls	Paving/Striping	1	allow	10,000.00	10,000.00
2.	R&R Asphalt Paving	Paving/Striping			In Wet Utilities	In Wet Utilities
3.	Parking Stop	Paving/Striping			Omitted	Omitted
	Textura	Paving/Striping	1	min	350.00	350.00
	32 10 Subtotal					**10,350.00**
	32 80 Landscaping					
1.	Existing Tree - Spade (with in 1/8 mile of project)	Landscape	28	ea	2,000.00	56,000.00
2.	Salvaged Tree Nursery	Landscape			Excluded	Excluded
3.	Existing Tree - PIP (in limit of work area)	Landscape	59	ea	200.00	11,800.00
4.	Existing Tree - PIP (Outside limit of work area)	Landscape	56	ea	Excluded	Excluded
5.	1-01 - DG	Landscape	12,460	sf	2.50	31,150.00
6.	1-02 - Stabilized Aggerate	Landscape	1,240	sf	25.00	31,000.00
7.	1-03 - Rip Rap	Landscape	3,560	sf	10.00	35,600.00
8.	1-04 - Swale Rock - 3"	Landscape	5,280	sf	3.00	15,840.00
9.	1-22 - Flagstone Steps	Landscape			Excluded	Excluded
10.	1-19 - Artificial Turf (4/LS502)	Landscape	1,845	sf	20.00	36,900.00
11.	1-12 - Artificial Turf (5/LS502)	Landscape	200	sf	20.00	4,000.00
12.	1-21 - Artificial Turf (6/LS502 - Fall Protection)	Landscape	520	sf	30.00	15,600.00
13.	3-03 - Tree Guard & Paver Suspension System	Landscape	13	ea	5,000.00	65,000.00
14.	5-01 - Tree Grate	Landscape	9	ea	1,800.00	16,200.00
15.	5-02 - Grate @ Canopy Footing	Landscape	20	ea	1,800.00	36,000.00
16.	5-25 - Planter Pot 36"	Landscape	10	ea	In Site Furn.	In Site Furn.
17.	5-26 - Planter Pot 48"	Landscape	2	ea	In Site Furn.	In Site Furn.
18.	5-27 - Tree Planter 48"	Landscape	5	ea	In Site Furn.	In Site Furn.
19.	1-24 - Curb Drain - Supply grates to match tree grates (5/LS504)	Landscape	4	ea	2,500.00	10,000.00
20.	8-01 - Drainage Rock	Landscape	3,964	sf	In Pavers	In Pavers
21.	8-02 - Amended Soil - 18" Deep	Landscape	1,126	cy	105.00	118,235.83
22.	8-02 - Amended Soil @ Soil Cell - 32" deep per MFG	Landscape	675	cy	In Soil Cell	In Soil Cell
23.	8-02 - 4" AB above Soil Cells for pavers (3/LS501)	Landscape	113	cy	120.00	13,506.67
24.	8-03 - Structural Soil - 4' Deep w/ filter fabric	Landscape	474	cy	240.00	113,742.22
25.	8-04 - Sand Base (Below Sod)	Landscape	11,211	sf	3.75	42,041.25
26.	8-05 - Soil Cell System w/ 4" ABC Below	Landscape	6,078	sf	42.00	255,276.00
27.	8-05 - Drainage System @ Soil Cell	Landscape			Included	Included
28.	8-05 - 1' Perimeter Stone (#57 Rock) per Ferguson Soil Cell Details	Landscape			Included	Included

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COST BREAKDOWN

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29.	Trees - 60" Box	Landscape	1	ea	12,900.00	12,900.00
30.	Trees - 48" Box	Landscape	58	ea	2,550.00	147,900.00
31.	Trees - 36" Box	Landscape	89	ea	1,010.00	89,890.00
32.	Trees - 24" Box	Landscape	13	ea	350.00	4,550.00
33.	Root Barriers - 6/LP501 - 3 sides/tree	Landscape	161	ea	300.00	48,300.00
34.	Shrubs - 10 Gal.	Landscape	400	ea	160.00	64,000.00
35.	Shrubs - 5 Gal.	Landscape	958	ea	35.00	33,530.00
36.	Accents - 15 Gal.	Landscape	86	ea	175.00	15,050.00
37.	Accents - 10 Gal.	Landscape	29	ea	160.00	4,640.00
38.	Accents - 5 Gal.	Landscape	78	ea	85.00	6,630.00
39.	Grasses - 5 Gal.	Landscape	406	ea	35.00	14,210.00
40.	SOD - CYN DAC Bermudagrass	Landscape	11,211	sf	3.00	33,633.00
41.	Irrigation	Landscape	1	ls	131,453.00	131,453.00
42.	Irrigation - Backflow Preventer	Landscape	2	ea	Included	Included
43.	Mobilization / GCs	Landscape			Included	Included
44.	Landscape fine grading	Landscape	1	ls	25,000.00	25,000.00
45.	Landscape dust control	Landscape	1	ls	40,000.00	40,000.00
46.	90 Day maintenance & warranty	Landscape	1	ls	44,000.00	44,000.00
47.	Textura	Landscape	1,623,578	%	0.22%	3,571.87
48.	Subcontract Bond	Sub Bond	1,627,150	%	2.00%	32,543.00
	32 80 Subtotal					**1,659,692.84**
	33 30 Wet Utilities					
	Sewer Line					
1.	6" PVC SDR35 Sewer line (Excludes boring under SRP)	Wet Utilities	220	lf	140.00	30,800.00
2.	8" PVC SDR35 Sewer line (Excludes boring under SRP)	Wet Utilities	139	lf	155.00	21,545.00
3.	Sewer line Cleanout	Wet Utilities	2	ea	3,500.00	7,000.00
4.	Tie-in to existing manhole	Wet Utilities	2	ea	12,250.00	24,500.00
5.	Sump Drain @ Drinking Fountain	Wet Utilities	4	ea	1,650.00	6,600.00
	Waterline					
6.	1" SCH 80 PVC Water Line	Wet Utilities	296	lf	130.00	38,480.00
7.	2" SCH 80 PVC Water Line	Wet Utilities	493	lf	135.00	66,555.00
8.	3" SCH 80 PVC Water Line	Wet Utilities	10	lf	140.00	1,400.00
9.	Meter Assembly w/ Vault w/ RPBFA	Wet Utilities	3	ea	11,750.00	35,250.00
10.	2" Multi Water Meter Assembly	Wet Utilities	1	ea	7,500.00	7,500.00
11.	Replace 3" Meter	Wet Utilities			By Owner	By Owner
12.	Connect to existing stub	Wet Utilities	1	ea	2,500.00	2,500.00
13.	Waterline Service Connection	Wet Utilities	1	ea	4,500.00	4,500.00
	Fireline					
14.	6" DIP Fireline	Wet Utilities	123	lf	165.00	20,295.00
15.	Fireline Tap & Street Work (Saw Cut/Asphalt Patch)	Wet Utilities	2	ea	15,000.00	30,000.00
16.	Fire Riser To 8" AFF	Wet Utilities	1	ea	5,000.00	5,000.00
	Storm Drain System					
17.	6" HDPE Storm Drain	Wet Utilities	34	lf	70.00	2,380.00
18.	8" HDPE Storm Drain	Wet Utilities	43	lf	75.00	3,225.00
19.	12" HDPE Storm Drain	Wet Utilities	68	lf	80.00	5,440.00
20.	Tie-in to existing SD/Basin	Wet Utilities	5	ea	2,500.00	12,500.00
21.	Catch Basin - MAG 535 Type F	Wet Utilities	1	ea	9,000.00	9,000.00
22.	18" Drain Basin	Wet Utilities	1	ea	10,000.00	10,000.00
23.	ACO Radius Drain - 1.5' Wide @ Turf Steps	Wet Utilities	34	lf	In Concrete	In Concrete
24.	Storm Drain Allowance for Soil Cell System	Wet Utilities			Included	Included
25.	Traffic Control	Wet Utilities	1	ls	18,000.00	18,000.00
	Textura	Wet Utilities	362,470	%	0.22%	797.43
	33 30 Subtotal					**363,267.43**

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	32 13 Site Concrete					
1.	KN02 - Concrete Curb - MAG 220 C&G	Site Concrete	412	lf	40.00	16,480.00
2.	KN03 - Concrete Curb - MAG 222 Vert (2-02, 6" x 18")	Site Concrete	690	lf	65.00	44,850.00
3.	KN04 - Curb Cut - MAG 226	Site Concrete	4	ea	500.00	2,000.00
4.	1-05 - Vehicular Concrete (Type 1)	Site Concrete	1,034	sf	20.00	20,680.00
5.	1-06 - Vehicular Concrete (Type 2)	Site Concrete	15,835	sf	20.00	316,700.00
6.	1-07 - Vehicular Concrete (Type 3)	Site Concrete	2,643	sf	20.00	52,860.00
7.	1-08 - Vehicular Concrete (Type 4)	Site Concrete	4,319	sf	23.00	99,337.00
8.	1-09 - Decorative Banding	Site Concrete	2,687	sf	56.00	150,472.00
9.	1-10 - Concrete Pavement Pedestrian (Type 1)	Site Concrete	684	sf	19.00	12,996.00
10.	1-11 - Concrete Pavement Pedestrian (Type 2)	Site Concrete	1,030	sf	18.00	18,540.00
11.	1-12 - Vehicular Concrete at Pavers - 6" on 6" ABC (Conc. Only)	Site Concrete	13,250	sf	13.00	172,250.00
12.	1-17 - Truncated Domes	Site Concrete	355	sf	120.00	42,600.00
13.	1-24 - Curb Drain Concrete & Grates Install - Grate by Landscape (5/LS504)	Site Concrete	36	lf	120.00	4,320.00
14.	Dowels at Expansion Joints	Site Concrete	2,720	lf	8.00	21,760.00
15.	2-01 - Raised Concrete Header (6" x 8")	Site Concrete	228	lf	40.00	9,120.00
16.	2-02 - Raised Concrete Header at Parking	Site Concrete			In Conc. Curb	In Conc. Curb
17.	2-03 - Flush Concrete Header (8"x8")	Site Concrete	350	lf	42.00	14,700.00
18.	2-05 - Turf Steps - Acid Etch - curved	Site Concrete	133	lf	200.00	26,600.00
19.	2-06 - Seat Wall (Wall & Footing)	Site Concrete	50	lf	450.00	22,500.00
20.	2-07 - Seat Wall - Retaining (Wall & Footing)	Site Concrete	30	lf	500.00	15,000.00
21.	2-08 - Art Pedestal - 3' Dia. - Acid Etch	Site Concrete	3	ea	2,000.00	6,000.00
22.	3-01 - Swale Bridge Footings	Site Concrete	7	ea	4,500.00	31,500.00
23.	3-03 - Tree Guard & Paver Suspension System	Site Concrete	13	ea	750.00	9,750.00
24.	5-01 - Tree Grate - Install Concrete Ring Only	Site Concrete	9	ea	500.00	4,500.00
25.	5-02 - Canopy Grate - Install Only	Site Concrete	20	ea	500.00	10,000.00
26.	5-03 - Tie Downs - Install/Conc. Only per (4/LS504)	Site Concrete	8	ea	100.00	800.00
27.	5-10 - Ping Pong Table (4/LS505) - Footings Only	Site Concrete	2	ea	750.00	1,500.00
28.	5-16 - Removable Bollards - Install Only	Site Concrete	26	ea	500.00	13,000.00
	5-18 - Swing Bench Footing (3/LS505)	Site Concrete	3	ea	2,500.00	7,500.00
29.	5-19 - Umbrella Footings - Install Only	Site Concrete	12	ea	500.00	6,000.00
30.	5-27 - Tree Planter - Footing per 5/LS506	Site Concrete	5	ea	1,000.00	5,000.00
31.	5-43 - Decorative Paving Stud - Provide & Install	Site Concrete	67	ea	200.00	13,400.00
32.	Light Pole Base - 15' Max	Site Concrete	13	ea	1,600.00	20,800.00
33.	Light Pole Base - Over 15'	Site Concrete	22	ea	2,000.00	44,000.00
34.	Steel trench drain at bottom turf steps (3/C202 & 4/LS503)	Site Concrete	36	lf	800.00	28,800.00
35.	Light Totem/Lantern - Footing (5/S3.1)	Light Totem	5	ea	5,000.00	25,000.00
36.	EV Charging Station Footings - Reset per new elevation	Site Concrete	2	ea	2,000.00	4,000.00
37.	Continuous Footing at 1-15 Pavers (9 & 10/LS501)	Site Concrete	2,700	lf	22.00	59,400.00
38.	Mockups - Flatwork	Allowance	1	ls	20,000.00	20,000.00
39.	8" TD, Saw Cuts, Pump Allowance	Site Concrete	1	ls	50,000.00	50,000.00
40.	Wire Mesh over Stratavault (Per MFG, Not on drawings)	Site Concrete			Omitted	Omitted
41.	Vac Truck	Site Concrete	1	ls	25,000.00	25,000.00
42.	Textura	Site Concrete	$1,449,715.00	%	0.22%	3,189.37
43.	Subcontract Bond	Sub Bond	$1,452,904.37	%	2.00%	29,058.09
	32 13 Subtotal					**1,481,962.46**

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	32 14 Pavers					
1.	1-12 - Vehicular Concrete Pavers (Paver only - Conc. sub slab in Conc.)	Pavers	13,250	sf	17.50	231,875.00
2.	1-13 - Pavers Pedestrian (Type 1) - Grind/Shotblast	Pavers	534	sf	18.00	9,612.00
3.	1-14- Pavers Pedestrian (Type 2) - Shotblast	Pavers	2,023	sf	17.00	34,391.00
4.	1-15 - Permeable Pavers w/ continuous footer	Pavers	4,222	sf	17.50	73,885.00
5.	1-15 - Permeable Pavers - 18" Drainage Rock #47 Stone + Geo Fabric	Pavers	4,222	sf	13.50	56,997.00
6.	1-16 - Permeable Pavers (On soil cell)	Pavers	4,580	sf	16.00	73,280.00
7.	1-18 - Detectable Warning Paver	Pavers	454	sf	100.00	45,400.00
8.	1-22 - Flagstone steps - Install Only @ Conc.	Pavers			Excluded	Excluded
9.	Paver Suspension System (6/LS504)	Pavers		ea	In Landscape	In Landscape
10.	R&R existing pavers - Parking Lot	Pavers	10,092	sf	11.00	111,012.00
11.	R&R existing pavers - Utility Patch Back	Pavers	1	ls	20,000.00	20,000.00
12.	R&R existing pavers - West Area/Flagpole	Pavers	1	ls	15,000.00	15,000.00
13.	Textura	Pavers	$671,452.00	%	0.22%	1,477.19
14.	Subcontract Bond	Sub Bond	$672,929.19	%	2.00%	13,458.58
	32 14 Subtotal					**686,387.77**
	03 00 Cast-In-Place Concrete					
1.	Concrete Caisson - West Canopy (48"x17')	West Canopy	8	ea	6,000.00	48,000.00
2.	Concrete Caisson - East Canopy (48"x17')	East Canopy	8	ea	6,000.00	48,000.00
3.	Spread Footings - North Canopy/Storage 103 & 104 (6'x6'x18")	North Canopy	12	ea	2,800.00	33,600.00
4.	Spread Footings - South Canopy/Storage 102 (6'x6'x18")	South Canopy	12	ea	2,800.00	33,600.00
5.	Spread Footings - Restroom 110 (4'x4'x12")	Restrooms	8	ea	1,800.00	14,400.00
6.	Slab On Grade 4" On 4" - Storage 111 South Canopy	South Canopy	636	sf	42.00	26,712.00
7.	Slab On Grade 4" On 4" - Storage 103 North Canopy	North Canopy	426	sf	42.00	17,892.00
8.	Slab On Grade 4" On 4" - Storage 104 North Canopy	North Canopy	407	sf	42.00	17,094.00
9.	Slab On Grade 4" On 4" - Restroom 110	Restrooms	748	sf	42.00	31,416.00
10.	Turndowns/Continuous Footings - Storage 111 South Canopy	South Canopy	116	lf	N/A	N/A
11.	Turndowns/Continuous Footings - Storage 103 North Canopy	North Canopy	86	lf	N/A	N/A
12.	Turndowns/Continuous Footings - Storage 104 North Canopy	North Canopy	112	lf	N/A	N/A
13.	Turndowns/Continuous Footings - Restrooms 110	Restrooms	145	lf	N/A	N/A
14.	Vapor Barrier - 15 Mil.	South Canopy	636	sf	1.00	636.00
15.	Vapor Barrier - 15 Mil.	North Canopy	833	sf	1.00	833.00
16.	Vapor Barrier - 15 Mil.	Restrooms	748	sf	1.00	748.00
17.	Textura	North Canopy	272,931	%	0.22%	600.45
18.	Subcontract Bond	Sub Bond	273,531	%	2.00%	5,470.63
	03 00 Subtotal					**279,002.08**
	04 00 Masonry					
1.	Storage 111 - 8" CMU - 9' high - Ground Face	South Canopy	1,044	sf	38.00	39,672.00
2.	Storage 103 - 8" CMU - 9' high - Ground Face	North Canopy	774	sf	38.00	29,412.00
3.	Storage 104 - 8" CMU - 9' high - Ground Face	North Canopy	1,008	sf	38.00	38,304.00
4.	Restroom 110 - 8" CMU - 9' high - Ground Face	Restrooms	1,305	sf	38.00	49,590.00
5.	Textura	North Canopy	156,978	%	0.22%	345.35
	04 00 Subtotal					**157,323.35**
	05 05 Structural & Misc Steel					
1.	3-01 - Swale Bridge - Steel Scope	Landscape	426	sf	350.00	149,100.00
2.	3-02 - Garden Fence	Landscape	1,325	lf	88.00	116,600.00
3.	Demo/Patch Existing Iron Fence	Landscape			Excluded	Excluded
4.	5-18 - Swing Shade Structure	Landscape	3	ea	32,500.00	97,500.00
5.	North Canopy Framing	North Canopy	4,352	sf	60.00	261,120.00
6.	South Canopy Framing	South Canopy	3,314	sf	60.00	198,840.00
7.	East Canopy Framing	East Canopy	4,995	sf	65.00	324,675.00
8.	West Canopy Framing	West Canopy	4,995	sf	65.00	324,675.00
9.	Restroom Canopy	Restrooms	2,122	sf	60.00	127,320.00
10.	Light Lantern - Column	Light Totem	5	ea	6,500.00	32,500.00
11.	South Canopy - Columns	South Canopy	12	ea	3,500.00	42,000.00
12.	East Canopy - Columns	East Canopy	8	ea	5,000.00	40,000.00
13.	West Canopy - Columns	West Canopy	8	ea	5,000.00	40,000.00
14.	Storage 111 - Metal Louvers 3' high	South Canopy	348	sf	50.00	17,400.00
15.	Storage 103 - Metal Louvers 3' high	North Canopy	258	sf	50.00	12,900.00

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16.	Storage 104 - Metal Louvers 3' high	North Canopy	336	sf	50.00	16,800.00
17.	Restrooms - Metal Louvers 3' high	Restrooms	381	sf	50.00	19,050.00
18.	Storage 111 - Stainless Steel Bug Screen	South Canopy	348	sf	25.00	8,700.00
19.	Storage 103 - Stainless Steel Bug Screen	North Canopy	258	sf	25.00	6,450.00
20.	Storage 104 - Stainless Steel Bug Screen	North Canopy	336	sf	25.00	8,400.00
21.	Restrooms 110 - Stainless Steel Bug Screen	Restrooms	381	sf	25.00	9,525.00
22.	Sliding wire mesh partitions - (2) 6'x9'	Restrooms	2	ea	4,050.00	8,100.00
23.	Wire mesh screen - (1) 12'x5' Above RR Sink	Restrooms	60	sf	50.00	3,000.00
24.	Wire mesh screen - 3' Tall - Above RR walls	Restrooms	249	sf	50.00	12,450.00
25.	Wire mesh screen - 3' Tall - Above RR walls	North Canopy	96	sf	50.00	4,800.00
26.	Structural Support for Adult Changing Station - CMU Wall	Restrooms	1	ls	2,000.00	2,000.00
27.	Steel Plate @ RR Interior Walls - (4 & 5/A800, 4 & 9/A801, 3 & 4 & 5/A802)	Restrooms	1	ls	30,000.00	30,000.00
28.	Scupper Box @ Roof Drain Nozzle (9/A800)	Restrooms	4	ea	1,200.00	4,800.00
29.	Mockup	Allowance	1	ls	73,000.00	73,000.00
30.	AESS 2 at areas >20'. AESS 3 at areas >20' high. SSPC-SP6. **Scope TBD**	North Canopy	4,505	sf	5.00	22,525.00
31.	AESS 2 at areas >20'. AESS 3 at areas >20' high. SSPC-SP6. **Scope TBD**	South Canopy	4,404	sf	5.00	22,020.00
32.	AESS 2 at areas >20'. AESS 3 at areas >20' high. SSPC-SP6. **Scope TBD**	East Canopy	5,989	sf	5.00	29,945.00
33.	AESS 2 at areas >20'. AESS 3 at areas >20' high. SSPC-SP6. **Scope TBD**	West Canopy	5,960	sf	5.00	29,800.00
34.	AESS 2 at areas >20'. AESS 3 at areas >20' high. SSPC-SP6. **Scope TBD**	Restrooms	2,225	sf	5.00	11,125.00
35.	Textura	South Canopy	$2,107,120.00	%	0.22%	4,635.66
36.	Subcontract Bond	Sub Bond	$2,111,755.66	%	2.00%	42,235.11
	05 05 Subtotal					**2,153,990.77**
	05 70 Decorative Metals					
1.	East Canopy - Custom Paneling w/ Kynar Finish **(Pattern Not Defined Yet)**	East Canopy	5,486	sf	93.00	510,198.00
2.	West Canopy - Custom Paneling w/ Kynar Finish **(Pattern Not Defined Yet)**	West Canopy	5,486	sf	93.00	510,198.00
3.	East Canopy - Custom Pattern	East Canopy	5,486	sf	7.50	41,145.00
4.	West Canopy - Custom Pattern	West Canopy	5,486	sf	7.50	41,145.00
5.	Light Totem/Lantern - Custom Paneling - 5 total	Light Totem	733	sf	225.00	164,850.00
6.	1/8" Acrylic per 4/A804 & Install	Light Totem	1,026	sf	50.00	51,286.67
7.	Textura	East Canopy	1,318,823	%	0.22%	2,901.41
8.	Subcontract Bond	Sub Bond	1,321,724	%	1.00%	13,217.24
	05 70 Subtotal					**1,334,941.32**
	06 10 Rough Carpentry					
1.	Rough Carpentry - Roof Blocking	Restrooms	2,209	sf	0.50	1,104.50
2.	Rough Carpentry - Roof Blocking	North Canopy	4,486	sf	0.50	2,243.00
3.	Rough Carpentry - Roof Blocking	South Canopy	3,298	sf	0.50	1,649.00
4.	Textura	West Canopy	4,997	%	0.22%	10.99
	06 10 Subtotal					**5,007.49**
	07 10 Waterproofing					
1.	Waterproof Footings & Retaining Walls (Tremco 250 GC)	Restrooms	3,105	sf	6.50	20,182.50
2.	Waterproof membrane @ Restroom floors	Restrooms			N/A	N/A
3.	Water Proofing @ Seat Wall	Landscape	1	ls	3,500.00	3,500.00
4.	Fluid Applied Air Barrier @ CMU & Framed walls (Tremco ExoAir 230)	Restrooms	4,131	sf	6.50	26,851.50
5.	Textura	Restrooms	50,534	%	0.22%	111.17
	07 10 Subtotal					**50,645.17**
	07 50 Roofing					
1.	Roofing - Fluid Applied Restrooms	Restrooms	2,209	sf	8.50	18,776.50
2.	Roofing - Fluid Applied West Canopy	West Canopy	5,230	sf	8.50	44,455.00
3.	Roofing - Fluid Applied East Canopy	East Canopy	5,230	sf	8.50	44,455.00
4.	Roofing - Fluid Applied North Canopy	North Canopy	4,486	sf	8.50	38,131.00
5.	Roofing - Fluid Applied South Canopy	South Canopy	3,298	sf	8.50	28,033.00
6.	Textura	West Canopy	173,851	%	0.22%	382.47
	07 50 Subtotal					**174,232.97**

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	07 92 Caulking & Sealants					
1.	Caulking - Hardscape	Site Concrete	41,482	sf	0.40	16,592.80
2.	Caulking - Masonry - North Canopy	North Canopy	1,782	sf	1.00	1,782.00
3.	Caulking - Masonry - South Canopy	South Canopy	1,044	sf	1.00	1,044.00
4.	Caulking - Masonry - Restrooms	Restrooms	1,305	sf	1.00	1,305.00
5.	Textura	Site Concrete	20,724	%	0.22%	45.59
	07 92 Subtotal					**20,769.39**
	08 11 Doors, Frames & Hardware					
1.	6'x7'-10" Pair HM Door/HM Frame - Storage 102	South Canopy	1	pair	6,200.00	6,200.00
2.	6'x7'-10" Pair HM Door/HM Frame - Storage 103 & 104	North Canopy	2	pair	6,200.00	12,400.00
3.	3'x7'-10" HM Door/HM Frame - Storage 104	North Canopy	2	ea	3,500.00	7,000.00
4.	3'x7'-10" HM Door/HM Frame - Restroom	Restrooms	4	ea	3,500.00	14,000.00
5.	Low Voltage - Hardware at Restroom Doors	North Canopy	11	ls	3,000.00	33,000.00
6.	Textura	North Canopy	72,600	%	0.22%	159.72
	08 11 Subtotal					**72,759.72**
	09 22 Metal Stud Framing & Drywall					
1.	Framing/Drywall - Restrooms - 9'H	Restrooms	1,169	sf	15.00	17,527.50
2.	Framing @ Stucco Ceiling	North Canopy	870	sf	4.00	3,480.00
3.	Framing @ Stucco Ceiling	South Canopy	1,320	sf	4.00	5,280.00
4.	Roof Framing - Restrooms	Restrooms	2,122	sf	3.50	7,427.00
5.	Roof Framing - North Canopy	North Canopy	4,486	sf	3.50	15,701.00
6.	Roof Framing - South Canopy	South Canopy	3,298	sf	3.50	11,543.00
7.	Textura	North Canopy	60,959	%	0.22%	134.11
	09 22 Subtotal					**61,092.61**
	09 24 EIFS & Stucco					
1.	Stucco @ Ceilings	North Canopy	870	sf	12.00	10,440.00
2.	Stucco @ Ceilings	South Canopy	1,320	sf	12.00	15,840.00
3.	Textura	South Canopy	26,280		0.00	57.82
	09 24 Subtotal					**26,337.82**
	09 30 Floor & Wall Tile					
1.	F2 - Thinset Tile Floor	Restrooms			Omitted	Omitted
2.	F2 - Thinset Tile Floor - RR @ North Canopy	Restrooms			Omitted	Omitted
3.	T1 - Wall Tile @ Restrooms	Restrooms	2,685	sf	18.00	48,330.00
4.	T1 - Wall Tile @ Restrooms - RR @ North Canopy	North Canopy	565	sf	18.00	10,170.00
5.	Mock Ups	Allowance	1	ls	2,500.00	2,500.00
6.	Textura	Restrooms	61,000	%	0.22%	134.20
	09 30 Subtotal					**61,134.20**

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COST BREAKDOWN

Dr. A.J. Chandler Park - 90% GMP - Final

Est. Date: 11/12/2025

Item #	Division - Description/Scope Of Work	Refer.	Estimate Qty.	U/M	Unit Price	TOTALS
09 50	**Acoustical Ceilings**					
1.	T&G Wood Ceilings - North Canopy	North Canopy	3,394	sf	30.00	101,820.00
2.	T&G Wood Ceilings - South Canopy	South Canopy	2,480	sf	30.00	74,400.00
3.	T&G Wood Ceilings - Restrooms	Restrooms	2,111	sf	30.00	63,330.00
4.	T&G Wood Ceilings - North Canopy - Sealer/Fire Proofing	North Canopy	3,394	sf	4.00	13,576.00
5.	T&G Wood Ceilings - South Canopy - Sealer/Fire Proofing	South Canopy	2,480	sf	4.00	9,920.00
6.	T&G Wood Ceilings - Restrooms - Sealer/Fire Proofing	Restrooms	2,111	sf	4.00	8,444.00
7.	Textura	North Canopy	271,490	%	0.22%	597.28
09 50	**Subtotal**					**272,087.28**
09 67	**Polish Flooring**					
1.	Sealed Concrete Flooring	South Canopy	636	sf	2.00	1,272.00
2.	Polish / Seal Concrete Flooring	North Canopy	833	sf	4.00	3,332.00
3.	Polish / Seal Concrete Flooring	Restrooms	748	sf	5.00	3,740.00
4.	Textura	Restrooms	8,344	%	0.22%	18.36
09 67	**Subtotal**					**8,362.36**
09 90	**Painting**					
1.	Paint - Site Misc.	Site Concrete	1	ls	16,000.00	16,000.00
2.	North Canopy - Roof Edge Bent Plate	North Canopy	4,352	sf	1.40	6,092.80
3.	South Canopy - Roof Edge Bent Plate	South Canopy	3,314	sf	1.40	4,639.60
4.	East Canopy - Roof Edge Bent Plate	East Canopy	4,995	sf	1.40	6,993.00
5.	West Canopy - Roof Edge Bent Plate	West Canopy	4,995	sf	1.40	6,993.00
6.	Restrooms - Roof Edge Bent Plate	Restrooms	852	sf	1.40	1,192.80
7.	Anti Graffiti Paint @ Exterior CMU (A403)	Restrooms	4,751	sf	2.00	9,501.30
8.	Mesh Partitions above toilet walls	Restrooms	852	sf	5.00	4,260.00
9.	Light Totem - Paint	Light Totem	5	ls	500.00	2,500.00
10.	Textura	Restrooms	58,173	%	0.0022	127.98
09 90	**Subtotal**					**58,300.48**
10 14	**Signage**					
1.	Interpretive Signage	Signage	5	ea	9,341.25	46,706.25
2.	Inground Signage	Signage	1	ea	4,215.00	4,215.00
3.	Entry Signage Allowance (New scope from 60% plans)	Signage			Add Alts	Add Alts
4.	ADA/Building Signage	Restrooms	6	ea	300.00	1,800.00
5.	ADA/Building Signage	North Canopy	4	ea	300.00	1,200.00
6.	ADA/Building Signage	South Canopy	1	ea	300.00	300.00
7.	Textura	Signage	54,221	%	0.22%	119.29
10 14	**Subtotal**					**54,340.54**
10 20	**Interior & Safety Specialties**					
1.	Restroom Accessories - Grab Bars	Restrooms	12	ea	100.00	1,200.00
2.	Restroom Accessories - TP Disp	Restrooms	9	ea	300.00	2,700.00
3.	Restroom Accessories - Sanitary Napkin Disp	Restrooms	9	ea	300.00	2,700.00
4.	Restroom Accessories - Signage	Restrooms	3	ea	150.00	450.00
5.	Restroom Accessories - Mirrors	Restrooms	3	ea	200.00	600.00
6.	Restroom Accessories - Baby Changing Station	Restrooms	1	ea	850.00	850.00
7.	Restroom Accessories - Grab Bars	North Canopy	6	ea	100.00	600.00
8.	Restroom Accessories - TP Disp	North Canopy	2	ea	300.00	600.00
9.	Restroom Accessories - Sanitary Napkin Disp	North Canopy	2	ea	300.00	600.00
10.	Restroom Accessories - Signage	North Canopy	2	ea	150.00	300.00
11.	Restroom Accessories - Mirrors	North Canopy	2	ea	200.00	400.00
12.	Restroom Accessories - Baby Changing Station	North Canopy	1	ea	850.00	850.00
13.	Adult Changing Station - Powered	Restrooms	1	ea	10,500.00	10,500.00
14.	Textura	Restrooms	22,350		0.00	49.17
10 20	**Subtotal**					**22,399.17**

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COST BREAKDOWN

Dr. A.J. Chandler Park - 90% GMP - Final

Est. Date: 11/12/2025

Item #	Division - Description/Scope Of Work	Refer.	Estimate Qty.	U/M	Unit Price	TOTALS
	12 90 Site Furnishings					
	Dave Bang					
1.	5-03 Tie-Down	Site Furnishings	8	ea	150.00	1,200.00
2.	5-06 Bistro Chair **(Spec TBD)**	Site Furnishings	137	pair	250.00	34,250.00
3.	5-07 Bistro Table - Round **(Spec TBD)**	Site Furnishings	76	ea	350.00	26,600.00
4.	5-08 Picnic Table Single	Site Furnishings	2	ea	1,800.00	3,600.00
5.	5-09 Picnic Table	Site Furnishings	12	ea	2,500.00	30,000.00
6.	5-10 Picnic Table Right Extension	Site Furnishings	3	ea	2,900.00	8,700.00
7.	5-11 Picnic Table Left Extension	Site Furnishings	3	ea	2,900.00	8,700.00
8.	5-13 Trash Receptacle	Site Furnishings	19	ea	2,700.00	51,300.00
9.	5-16 Removable Bollard	Site Furnishings	26	ea	1,000.00	26,000.00
10.	5-19 Shade Umbrella	Site Furnishings	12	ea	6,700.00	80,400.00
11.	5-20 Disc Shade with Table	Site Furnishings			Excluded	Excluded
12.	5-21 Chess Table	Site Furnishings	3	ea	2,000.00	6,000.00
13.	5-22 Bench 117"	Site Furnishings	7	ea	5,100.00	35,700.00
14.	5-23 Bench 175"	Site Furnishings	8	ea	7,500.00	60,000.00
15.	5-15 Bike Rack	Site Furnishings	20	ea	650.00	13,000.00
16.	5-33 Swing	Site Furnishings	1	ea	10,000.00	10,000.00
17.	Shipping & Handling	Site Furnishings	337	ea	140.00	47,180.00
18.	Install	Site Furnishings	1	ls	50,000.00	50,000.00
	Playspace Designs					
19.	5-05 Circular Bench - Pricing doubled since 60% per Play Space	Site Furnishings	13	ea	3,350.00	43,550.00
20.	5-12 Ping Pong Table	Site Furnishings	2	ea	10,000.00	20,000.00
21.	5-14 Dog Bag Station	Site Furnishings	4	ea	700.00	2,800.00
22.	5-27 Tree Planter	Site Furnishings	5	ea	2,500.00	12,500.00
23.	5-28 Pebble 24"x18"	Site Furnishings	1	ea	900.00	900.00
24.	5-29 Pebble 36"x25"	Site Furnishings	1	ea	1,200.00	1,200.00
25.	5-30 Pebble 42"x28"	Site Furnishings	2	ea	1,800.00	3,600.00
26.	5-31 Pebble 56"x37"	Site Furnishings	1	ea	5,000.00	5,000.00
27.	5-32 Distortion Mirrors	Site Furnishings	1	ea	8,500.00	8,500.00
28.	5-34 Effect Disc B with Post	Site Furnishings	1	ea	8,500.00	8,500.00
29.	5-35 Babel Drum large	Site Furnishings	1	ea	4,000.00	4,000.00
30.	5-36 Sound Column	Site Furnishings	1	ea	9,000.00	9,000.00
31.	Global Trade Impact Fee (Tariffs)	Site Furnishings	1	ls	20,000.00	20,000.00
32.	Shipping & Handling	Site Furnishings	1	ls	30,000.00	30,000.00
33.	Install	Site Furnishings	1	ls	20,000.00	20,000.00
	Landscape Forms					
34.	5-04 Adirondack Chair (LOLL Spec)	Site Furnishings	34	ea	540.00	18,360.00
35.	5-18 Shade Structure - Swing (Shade Structure in Steel)	Site Furnishings	4	ea	13,700.00	54,800.00
36.	5-25 Planter Pot 36"	Site Furnishings	10	ea	1,800.00	18,000.00
37.	5-26 Planter Pot 48"	Site Furnishings	2	ea	3,500.00	7,000.00
38.	Shipping & Handling	Site Furnishings	1	ls	12,000.00	12,000.00
39.	Install	Site Furnishings	1	ls	35,000.00	35,000.00
	Miracle Playground Sales					
40.	5-37 Glomist	Site Furnishings	3	ea	7,850.00	23,550.00
41.	5-38 Glomist Nano	Site Furnishings	2	ea	7,000.00	14,000.00
42.	Shipping & Handling	Site Furnishings	1	ls	4,500.00	4,500.00
43.	Install	Site Furnishings	1	ls	40,000.00	40,000.00
	Cart King					
44.	Mobile Game Cart	Site Furnishings	1	ea	5,500.00	5,500.00
45.	Shipping & Handling	Site Furnishings	1	ls	1,200.00	1,200.00
46.	Install	Site Furnishings			N/A	N/A

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COST BREAKDOWN

Dr. A.J. Chandler Park - 90% GMP - Final

Est. Date: 11/12/2025

Item #	Division - Description/Scope Of Work	Refer.	Estimate Qty.	U/M	Unit Price	TOTALS
	Mecca Designs					
47.	Mobile Book Cart	Site Furnishings	1	ea	10,000.00	10,000.00
48.	Shipping & Handling	Site Furnishings	1	ls	2,000.00	2,000.00
49.	Install	Site Furnishings			N/A	N/A
	Art Solutions					
50.	Statue Removal / Storage (6 months) / Relocate	Site Furnishings	3	ea	13,000.00	39,000.00
51.	Statue Storage - (Beyond 6 months)	Site Furnishings	6	months	1,300.00	7,800.00
	Miscellaneous					
52.	3-04 - Water Bollards (No Specs)	Site Furnishings	5	ea	In Plumbing	In Plumbing
53.	5-17 Drinking Fountain	Site Furnishings	4	ea	In Plumbing	In Plumbing
54.	5-24 EV Charging Station (New)	Site Furnishings	2	ea	In Electrical	In Electrical
55.	Bollard (Helio 600 LIT)	Site Furnishings			In Electrical	In Electrical
56.	Bench 59"	Site Furnishings			Omitted	Omitted
57.	Textura	Site Furnishings	974,890	%	0.22%	2,144.76
58.	Subcontract Bond	Sub Bond	977,035	%	1.00%	9,770.35
12 90	**Subtotal**					**986,805.11**
21 00	**Fire Protection**					
1.	Fire Protection - Restroom 110	Restrooms	852	sf	Excluded	Excluded
2.	Fire Protection - Restroom 104 @ North Canopy	North Canopy	100	sf	152.50	15,250.00
3.	Fire Protection - South Storage Room	South Canopy	655	sf	14.05	9,200.00
4.	Fire Protection - Canopies				Excluded	Excluded
5.	Textura	North Canopy	24,450	%	0.22%	53.79
21 00	**Subtotal**					**24,503.79**
22 01	**Plumbing**					
1.	Toilets	Restrooms	9	ea	8,000.00	72,000.00
2.	Urinals	Restrooms	3	ea	8,000.00	24,000.00
3.	Lavatories	Restrooms	3	ea	8,000.00	24,000.00
4.	Floor Drains	Restrooms	6	ea	8,000.00	48,000.00
5.	Trough Sink	Restrooms	1	ls	16,000.00	16,000.00
6.	Roof Drains @ Restrooms	Restrooms	2	ea	7,000.00	14,000.00
7.	Hose Bibs	Restrooms	3	ea	6,000.00	18,000.00
8.	Toilets	North Canopy	2	ea	6,000.00	12,000.00
9.	Urinals	North Canopy	2	ea	6,000.00	12,000.00
10.	Lavatories	North Canopy	2	ea	6,000.00	12,000.00
11.	Floor Drains	North Canopy	2	ea	6,000.00	12,000.00
12.	Hose Bibs	Wet Utilities	6	ea	4,000.00	24,000.00
13.	Drinking Fountains	Wet Utilities	4	ea	12,000.00	48,000.00
14.	3-04 - Water Bollards Stub Up (No Specs)	Wet Utilities	5	ea	2,000.00	10,000.00
15.	Textura	Restrooms	346,000	%	0.22%	761.20
22 01	**Subtotal**					**346,761.20**
23 05	**HVAC Systems**					
1.	No Scope	Restrooms				-
23 05	**Subtotal**					**0.00**

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COST BREAKDOWN

Dr. A.J. Chandler Park - 90% GMP - Final

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Item #	Division - Description/Scope Of Work	Refer.	Estimate Qty.	U/M	Unit Price	TOTALS
26 05	**Electrical**					
1.	Power & Lighting - General Site Electrical	Site Electrical	112,850	sf	11.10	1,252,635.00
2.	Power & Lighting - North Canopy / Storage 103 & 104	North Canopy	4,352	sf	22.00	95,744.00
3.	Power & Lighting - East Canopy	East Canopy	4,995	sf	17.00	84,915.00
4.	Power & Lighting - West Canopy	West Canopy	4,995	sf	17.00	84,915.00
5.	Power & Lighting - South Canopy / Storage 102	South Canopy	3,314	sf	26.50	87,821.00
6.	Power & Lighting - Restroom/Canopy (Includes Gear/Panels)	Restrooms	2,122	sf	68.00	144,296.00
7.	EG1 - 25' Pole	Site Electrical	4	ea	Included	Included
8.	EG1 - Fixtures	Site Electrical	12	ea	Included	Included
9.	EG2 - 14' Pole	Site Electrical	13	ea	Included	Included
10.	EG2 - Fixtures	Site Electrical	13	ea	Included	Included
11.	EG3 - 21" Bollard	Site Electrical	16	ea	Included	Included
12.	EG4 - Tree Uplight	Site Electrical	34	ea	Included	Included
13.	EG5 - Sculpture Uplight	Site Electrical	9	ea	Included	Included
14.	EG7 - Canopy / Column Uplight (In-ground)	Site Electrical	64	ea	Included	Included
15.	EG8 - 32" Bollard	Site Electrical	5	ea	Included	Included
16.	EG9 - Canopy / Column Uplight (in-ground)	Site Electrical	28	ea	Included	Included
17.	EP1 - Pole (28'-10")	Site Electrical	8	ea	Included	Included
18.	EP1 - Cable	Site Electrical	260	lf	Included	Included
19.	EP1 - Fixtures	Site Electrical	12	ea	Included	Included
20.	EP2 - Pole (22')	Site Electrical	10	ea	Included	Included
21.	EP2 - Cable	Site Electrical	216	lf	Included	Included
22.	EP2 - Fixtures	Site Electrical	50	ea	Included	Included
23.	ER1 - Canopy Downlight	Site Electrical	12	ea	Included	Included
24.	ER2 - Restroom / Storage Downlight	Site Electrical	20	ea	Included	Included
25.	ES1 - Flexible Tape Light	Site Electrical	930	lf	Included	Included
26.	ES2 - Suspended Downlight	Site Electrical	12	ea	Included	Included
27.	EW1 - Scone (Wall Mounted)	Site Electrical	6	ea	Included	Included
28.	EX3 - Lantern Uplight	Light totem	5	ea	Included	Included
29.	EX4 - Lantern Backlight (27' entire height of lantern)	Light totem	5	ea	Included	Included
30.	Fans @ Restrooms	Restrooms	3	ea	5,000.00	15,000.00
31.	Power to (2) future Kiosk	Restrooms	2	ea	5,000.00	10,000.00
32.	Power to EV Charging Station - 50' of Trench	Site Electrical	50	lf	300.00	15,000.00
33.	EV Charger - New Charger In Lieu of Reset Existing	Site Electrical	2	ea	15,000.00	30,000.00
34.	Power to Adult Changing Station	Site Electrical	1	ls	2,500.00	2,500.00
35.	Power to Christmas Tree	Site Electrical	1	ls	5,000.00	5,000.00
36.	HAWK Crossing	Site Electrical	1	pair	90,000.00	90,000.00
37.	HAWK Crossing - Pot holing, tree demo, signage relocate	Site Electrical	1	ls	15,000.00	15,000.00
38.	Light Totem - Fixtures/Power	Light totem	5	ea	32,000.00	160,000.00
39.	Outlet Allowance - Per City Request	Site Electrical	10	ea	1,000.00	10,000.00
40.	Textura	Site Electrical	2,102,826	%	0.22%	4,626.22
41.	Subcontract Bond	Sub Bond	2,107,452	%	1.00%	21,074.52
26 05	**Subtotal**					**2,128,526.74**
27 20	**Teleco and Data**					
1.	Telecommunications and Data - WiFi	Site Electrical			Excluded	Excluded
2.	Low Voltage/Access Control By Owner	Site Electrical			By Owner	By Owner
27 20	**Subtotal**					**0.00**
28 31	**Fire Detection & Alarm**					
1.	Fire Life Safety Systems			ls	In Elec.	In Elec.
28 31	**Subtotal**					**0.00**
01 21	**Special/Owner - Allowances**					
1.	Allowance - Design Contingency (will go to zero at GMP)	Allowance	18,600,962	%	1.50%	279,014.42
2.	Allowance - Mockup (A006, Canopies, Buildings, Landscaping)	Allowance	1	ls	76,000.00	76,000.00
3.	Reduce South Canopy Scope/Cost	Allowance			N/A	N/A
01 21	**Subtotal**					**355,014.42**

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COST BREAKDOWN

Dr. A.J. Chandler Park - 90% GMP - Final

Est. Date: 11/12/2025

Item #	Division - Description/Scope Of Work	Refer.	Estimate Qty.	U/M	Unit Price	TOTALS
	COSTS OF WORK TOTALS:					**13,843,893.01**
1.	GENERAL CONDITIONS (14 MONTHS)					1,777,625.61
2.	CM@RISK'S FEE (7.5%)					1,171,613.90
3.	BONDS (PAYMENT & PERFORMANCE)					167,931.33
4.	INSURANCE (GEN. LIABILITY & BUILDER RISK)					237,454.89
5.	SALES TAX (CHANDLER, AZ - 5.0700%)					871,964.90
6.	CONTRACTORS CONTINGENCY (3.5%)					632,466.93
7.	OWNERS CONTINGENCY (4.5%)					813,171.76
8.	TOTAL VE DEDUCTS (RED LIST BELOW)					(1,535,165.96)
	TOTAL:					**17,980,956.36**

Summary Cost by Major Work Type	Loaded Cost
General Requirements	423,049
Demolition	244,256
Earthwork	413,349
SWPPP	208,849
Paving & Striping	13,510
Landscaping	2,602,579
Wet Utilities	581,209
Restroom	1,275,014
Site Concrete	1,880,346
Pavers	878,377
West Canopy	1,475,743
East Canopy	1,479,206
South Canopy (With Building)	850,294
North Canopy (With Building)	1,167,898
Site Furnishings	1,275,327
Signage	66,623
Site Electrical	1,859,746
Light Totem	569,291
Allowance - Design Contingency	364,199
Allowance - Mockups	223,860
Sub Bonds	217,761
Contractor's Contingency 3.5%	632,467
Owners Contingency 4.5%	813,172
Total VE Deducts (Red List Below)	(1,535,166)
	17,980,956

Deduct Alternates (Included Above)	Loaded Cost
Omit all tree spading. Includes tree demo ILO spade.	(56,020)
Omit 60" Box Tree	(15,182)
Reduce tree barriers from 161 to 60.	(35,660)
Change all 10 gal shrubs to 5 gal shrubs.	(58,845)
Omit scuppers and trench drains at northeast.	(19,207)
Area drain/catch basin in lieu of radius ACO drain at turf steps	Excluded
Reduce 25% of AESS scope. Pending design clarification	(33,958)
Omit all Swale Bridges. Add sidewalks and culverts.	(186,656)
Remove 6" ABC below Vehicular Concrete at Pavers (1-12)	(31,188)
Change (48) Euculiptis trees from 36" box to 24" box	(37,284)
Site Concrete Reduction	(23,538)
Delete Waterproofing at Buildings and Site Walls	(59,604)
Site Furnishings Omit Tree Planters and Pots (5-25, 5-26, & 5-27)	(57,962)
Delete (2) Drinking Fountains	(28,246)
Metal Panel Patern - 25% Open	Excluded
Lighting Reduction - Replace EG1 with EG3 Bollards & Delete 28 EG4 Lights	(150,938)
Wood T&G In Lieu of Metal Panel at E/W Canopy - Includes Solid Panels at Gable Ends and Added Support Framing/Flashing	(634,603)
Reduce Sub Bonds	(106,275)
	(1,535,166)

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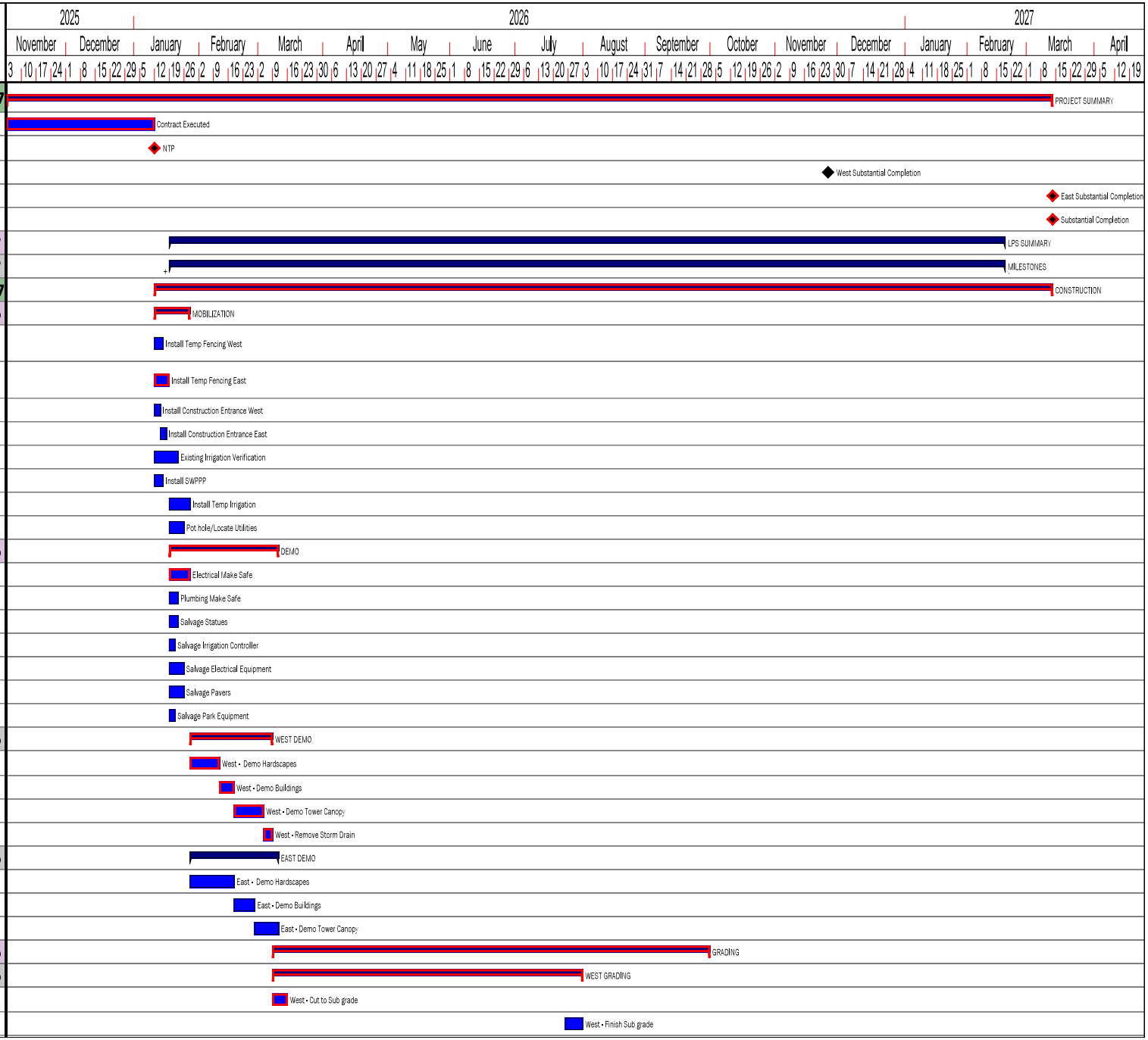
Dr AJ Chandler Park

CHANDLER arizona

Line	Activity ID	Name	Duration	Start	Finish
1	1	**PROJECT SUMMARY**	**339d**	**11/03/25**	**03/12/27**
2	6	Contract Executed	43d	11/03/25	01/09/26
3	2	NTP		01/12/26	01/12/26
4	5	West Substantial Completion		11/25/26	11/25/26
5	4	East Substantial Completion		03/12/27	03/12/27
6	3	Substantial Completion		03/12/27	03/12/27
7	1800	**LPS SUMMARY**	**275d**	**01/19/26**	**02/18/27**
8	0013	**MILESTONES**	**275d**	**01/19/26**	**02/18/27**
9	7	**CONSTRUCTION**	**296d**	**01/12/26**	**03/11/27**
10	8	**MOBILIZATION**	**12d**	**01/12/26**	**01/27/26**
11	14	Install Temp Fencing West	3d	01/12/26	01/14/26
12	11	Install Temp Fencing East	5d	01/12/26	01/16/26
13	15	Install Construction Entrance West	2d	01/12/26	01/13/26
14	10	Install Construction Entrance East	2d	01/14/26	01/15/26
15	17	Existing Irrigation Verification	8d	01/12/26	01/21/26
16	16	Install SWPPP	3d	01/12/26	01/14/26
17	12	Install Temp Irrigation	7d	01/19/26	01/27/26
18	13	Pot hole/Locate Utilities	5d	01/19/26	01/23/26
19	18	**DEMO**	**37d**	**01/19/26**	**03/10/26**
20	19	Electrical Make Safe	7d	01/19/26	01/27/26
21	20	Plumbing Make Safe	3d	01/19/26	01/21/26
22	21	Salvage Statues	3d	01/19/26	01/21/26
23	22	Salvage Irrigation Controller	2d	01/19/26	01/20/26
24	23	Salvage Electrical Equipment	5d	01/19/26	01/23/26
25	24	Salvage Pavers	5d	01/19/26	01/23/26
26	25	Salvage Park Equipment	2d	01/19/26	01/20/26
27	26	**WEST DEMO**	**28d**	**01/28/26**	**03/06/26**
28	27	West - Demo Hardscapes	10d	01/28/26	02/10/26
29	28	West - Demo Buildings	5d	02/11/26	02/17/26
30	29	West - Demo Tower Canopy	10d	02/18/26	03/03/26
31	30	West - Remove Storm Drain	3d	03/04/26	03/06/26
32	31	**EAST DEMO**	**30d**	**01/28/26**	**03/10/26**
33	32	East - Demo Hardscapes	15d	01/28/26	02/17/26
34	33	East - Demo Buildings	7d	02/18/26	02/26/26
35	34	East - Demo Tower Canopy	8d	02/27/26	03/10/26
36	35	**GRADING**	**145d**	**03/09/26**	**09/30/26**
37	36	**WEST GRADING**	**103d**	**03/09/26**	**07/31/26**
38	37	West - Cut to Sub grade	5d	03/09/26	03/13/26
39	38	West - Finish Sub grade	6d	07/24/26	07/31/26



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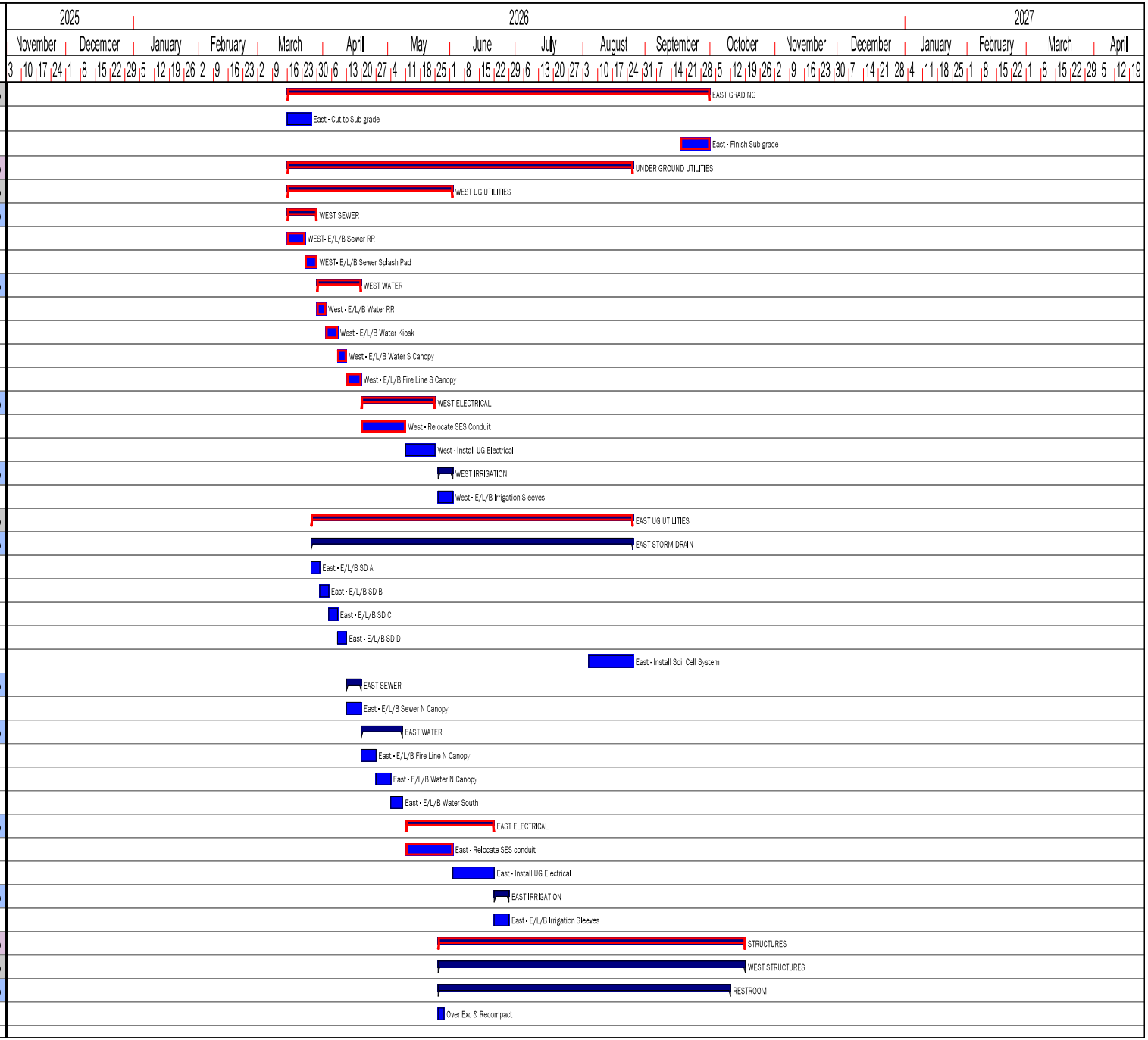
Dr AJ Chandler Park

Line	Activity ID	Name	Duration	Start	Finish
40	39	**EAST GRADING**	**140d**	**03/16/26**	**09/30/26**
41	41	East - Cut to Sub grade	8d	03/16/26	03/25/26
42	40	East - Finish Sub grade	10d	09/17/26	09/30/26
43	42	**UNDER GROUND UTILITIES**	**115d**	**03/16/26**	**08/25/26**
44	43	**WEST UG UTILITIES**	**55d**	**03/16/26**	**06/01/26**
45	44	**WEST SEWER**	**10d**	**03/16/26**	**03/27/26**
46	45	WEST- E/L/B Sewer RR	6d	03/16/26	03/23/26
47	46	WEST- E/L/B Sewer Splash Pad	4d	03/24/26	03/27/26
48	47	**WEST WATER**	**15d**	**03/30/26**	**04/17/26**
49	48	West - E/L/B Water RR	3d	03/30/26	04/01/26
50	49	West - E/L/B Water Kiosk	4d	04/02/26	04/07/26
51	50	West - E/L/B Water S Canopy	3d	04/08/26	04/10/26
52	51	West - E/L/B Fire Line S Canopy	5d	04/13/26	04/17/26
53	52	**WEST ELECTRICAL**	**25d**	**04/20/26**	**05/22/26**
54	53	West - Relocate SES Conduit	15d	04/20/26	05/08/26
55	54	West - Install UG Electrical	10d	05/11/26	05/22/26
56	55	**WEST IRRIGATION**	**5d**	**05/26/26**	**06/01/26**
57	56	West - E/L/B Irrigation Sleeves	5d	05/26/26	06/01/26
58	57	**EAST UG UTILITIES**	**107d**	**03/26/26**	**08/25/26**
59	58	**EAST STORM DRAIN**	**107d**	**03/26/26**	**08/25/26**
60	59	East - E/L/B SD A	3d	03/26/26	03/30/26
61	61	East - E/L/B SD B	3d	03/31/26	04/02/26
62	62	East - E/L/B SD C	3d	04/03/26	04/07/26
63	63	East - E/L/B SD D	3d	04/08/26	04/10/26
64	60	East - Install Soil Cell System	15d	08/05/26	08/25/26
65	64	**EAST SEWER**	**5d**	**04/13/26**	**04/17/26**
66	65	East - E/L/B Sewer N Canopy	5d	04/13/26	04/17/26
67	66	**EAST WATER**	**14d**	**04/20/26**	**05/07/26**
68	67	East - E/L/B Fire Line N Canopy	5d	04/20/26	04/24/26
69	68	East - E/L/B Water N Canopy	5d	04/27/26	05/01/26
70	69	East - E/L/B Water South	4d	05/04/26	05/07/26
71	70	**EAST ELECTRICAL**	**29d**	**05/11/26**	**06/19/26**
72	71	East - Relocate SES conduit	15d	05/11/26	06/01/26
73	72	East - Install UG Electrical	14d	06/02/26	06/19/26
74	73	**EAST IRRIGATION**	**5d**	**06/22/26**	**06/26/26**
75	74	East - E/L/B Irrigation Sleeves	5d	06/22/26	06/26/26
76	75	**STRUCTURES**	**102d**	**05/26/26**	**10/16/26**
77	76	**WEST STRUCTURES**	**102d**	**05/26/26**	**10/16/26**
78	77	**RESTROOM**	**97d**	**05/26/26**	**10/09/26**
79	78	Over Exc & Recompact	2d	05/26/26	05/27/26



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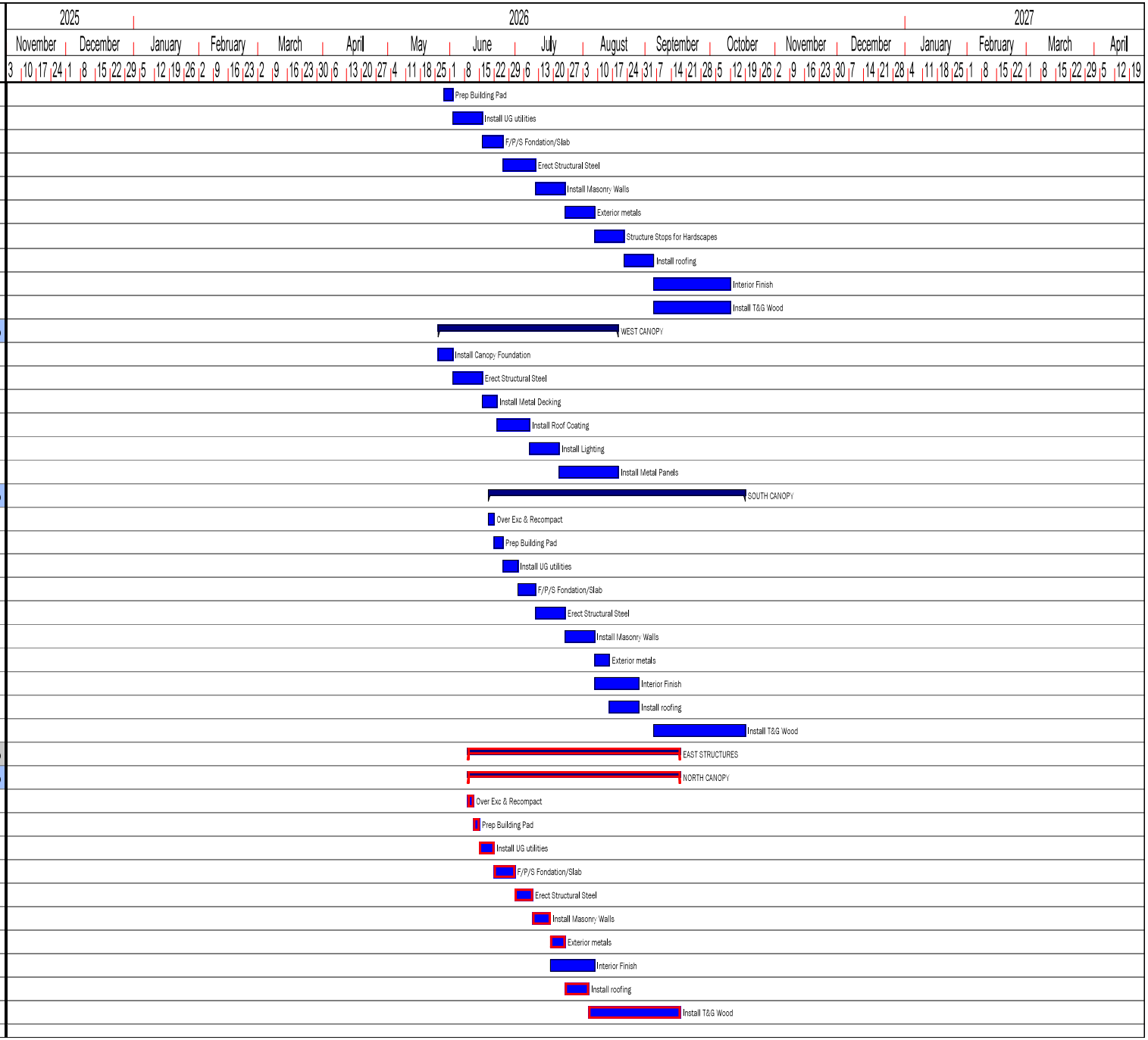
Dr AJ Chandler Park

Line	Activity ID	Name	Duration	Start	Finish
80	79	Prep Building Pad	3d	05/28/26	06/01/26
81	80	Install UG utilities	10d	06/02/26	06/15/26
82	81	F/P/S Fondation/Slab	7d	06/16/26	06/24/26
83	82	Erect Structural Steel	10d	06/25/26	07/09/26
84	83	Install Masonry Walls	10d	07/10/26	07/23/26
85	84	Exterior metals	10d	07/24/26	08/06/26
86	0093	Structure Stops for Hardscapes	10d	08/07/26	08/20/26
87	86	Install roofing	10d	08/21/26	09/03/26
88	85	Interior Finish	25d	09/04/26	10/09/26
89	87	Install T&G Wood	25d	09/04/26	10/09/26
90	**88**	**WEST CANOPY**	**60d**	**05/26/26**	**08/18/26**
91	89	Install Canopy Foundation	5d	05/26/26	06/01/26
92	90	Erect Structural Steel	10d	06/02/26	06/15/26
93	91	Install Metal Decking	5d	06/16/26	06/22/26
94	92	Install Roof Coating	10d	06/23/26	07/07/26
95	93	Install Lighting	10d	07/08/26	07/21/26
96	94	Install Metal Panels	20d	07/22/26	08/18/26
97	**95**	**SOUTH CANOPY**	**85d**	**06/18/26**	**10/16/26**
98	96	Over Exc & Recompact	2d	06/18/26	06/19/26
99	97	Prep Building Pad	3d	06/22/26	06/24/26
100	98	Install UG utilities	5d	06/25/26	07/01/26
101	99	F/P/S Fondation/Slab	5d	07/02/26	07/09/26
102	100	Erect Structural Steel	10d	07/10/26	07/23/26
103	101	Install Masonry Walls	10d	07/24/26	08/06/26
104	102	Exterior metals	5d	08/07/26	08/13/26
105	103	Interior Finish	15d	08/07/26	08/27/26
106	104	Install roofing	10d	08/14/26	08/27/26
107	105	Install T&G Wood	30d	09/04/26	10/16/26
108	**106**	**EAST STRUCTURES**	**70d**	**06/09/26**	**09/16/26**
109	**107**	**NORTH CANOPY**	**70d**	**06/09/26**	**09/16/26**
110	108	Over Exc & Recompact	2d	06/09/26	06/10/26
111	109	Prep Building Pad	2d	06/11/26	06/12/26
112	110	Install UG utilities	5d	06/15/26	06/19/26
113	111	F/P/S Fondation/Slab	7d	06/22/26	06/30/26
114	112	Erect Structural Steel	5d	07/01/26	07/08/26
115	113	Install Masonry Walls	6d	07/09/26	07/16/26
116	114	Exterior metals	5d	07/17/26	07/23/26
117	115	Interior Finish	15d	07/17/26	08/06/26
118	116	Install roofing	8d	07/24/26	08/04/26
119	117	Install T&G Wood	30d	08/05/26	09/16/26



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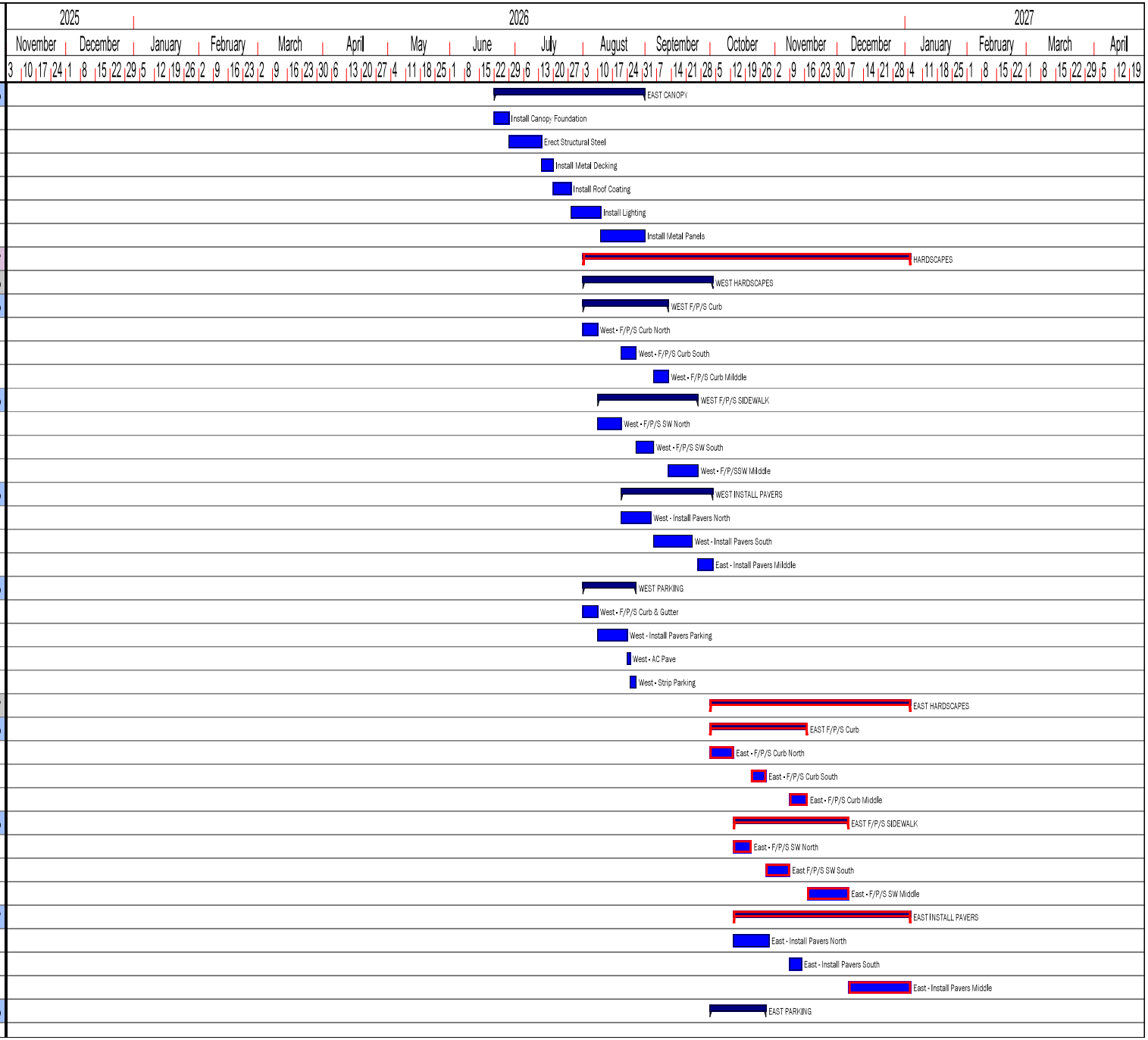
Dr AJ Chandler Park

Line	Activity ID	Name	Duration	Start	Finish
120	118	**EAST CANOPY**	50d	06/22/26	08/31/26
121	119	Install Canopy Foundation	5d	06/22/26	06/26/26
122	120	Erect Structural Steel	10d	06/29/26	07/13/26
123	121	Install Metal Decking	4d	07/14/26	07/17/26
124	122	Install Roof Coating	6d	07/20/26	07/27/26
125	123	Install Lighting	10d	07/28/26	08/10/26
126	124	Install Metal Panels	15d	08/11/26	08/31/26
127	125	**HARDSCAPES**	105d	08/03/26	01/04/27
128	126	**WEST HARDSCAPES**	43d	08/03/26	10/01/26
129	127	**WEST F/P/S Curb**	28d	08/03/26	09/10/26
130	128	West - F/P/S Curb North	5d	08/03/26	08/07/26
131	129	West - F/P/S Curb South	5d	08/20/26	08/26/26
132	130	West - F/P/S Curb Milddle	4d	09/04/26	09/10/26
133	131	**WEST F/P/S SIDEWALK**	33d	08/10/26	09/24/26
134	132	West - F/P/S SW North	8d	08/10/26	08/19/26
135	133	West - F/P/S SW South	6d	08/27/26	09/03/26
136	134	West - F/P/SSW Milddle	10d	09/11/26	09/24/26
137	135	**WEST INSTALL PAVERS**	30d	08/20/26	10/01/26
138	136	West - Install Pavers North	10d	08/20/26	09/02/26
139	137	West - Install Pavers South	12d	09/04/26	09/22/26
140	138	West - Install Pavers Milddle	5d	09/25/26	10/01/26
141	139	**WEST PARKING**	18d	08/03/26	08/26/26
142	141	West - F/P/S Curb & Gutter	5d	08/03/26	08/07/26
143	140	West - Install Pavers Parking	10d	08/10/26	08/21/26
144	143	West - AC Pave	1d	08/24/26	08/24/26
145	142	West - Strip Parking	2d	08/25/26	08/26/26
146	147	**EAST HARDSCAPES**	63d	10/01/26	01/04/27
147	148	**EAST F/P/S Curb**	33d	10/01/26	11/16/26
148	150	East - F/P/S Curb North	8d	10/01/26	10/12/26
149	149	East - F/P/S Curb South	5d	10/21/26	10/27/26
150	151	East - F/P/S Curb Middle	6d	11/09/26	11/16/26
151	152	**EAST F/P/S SIDEWALK**	37d	10/13/26	12/04/26
152	153	East - F/P/S SW North	6d	10/13/26	10/20/26
153	154	East F/P/S SW South	8d	10/28/26	11/06/26
154	155	East - F/P/S SW Middle	12d	11/17/26	12/04/26
155	156	**EAST INSTALL PAVERS**	55d	10/13/26	01/04/27
156	159	East - Install Pavers North	12d	10/13/26	10/28/26
157	157	East - Install Pavers South	4d	11/09/26	11/12/26
158	158	East - Install Pavers Middle	18d	12/07/26	01/04/27
159	160	**EAST PARKING**	19d	10/01/26	10/27/26



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Dr AJ Chandler Park

Line	Activity ID	Name	Duration	Start	Finish
160	163	East - F/P/S Curb & Gutter	5d	10/01/26	10/07/26
161	162	East - Install Pavers Parking	10d	10/08/26	10/21/26
162	164	East - AC Pave	2d	10/22/26	10/23/26
163	161	East - Strip Parking	2d	10/26/26	10/27/26
164	**168**	**LANDSCAPE**	**137d**	**08/03/26**	**02/17/27**
165	**169**	**WEST LANDSCAPES**	**63d**	**08/03/26**	**10/29/26**
166	172	West - Install Structural Soils	7d	08/03/26	08/11/26
167	170	West -Install Irrigation Main	10d	09/25/26	10/08/26
168	173	West - Amend Soil Planting Areas	12d	10/02/26	10/19/26
169	171	West - Install Irrigation Controller	3d	10/09/26	10/13/26
170	0172	West - Install Turf	10d	10/09/26	10/22/26
171	176	West - Install Tress	4d	10/20/26	10/23/26
172	174	West - Install Shrubs	3d	10/20/26	10/22/26
173	175	West - Install Drainage Rock	3d	10/20/26	10/22/26
174	177	West - Place DG	4d	10/26/26	10/29/26
175	**178**	**EAST LANDCAPES**	**95d**	**10/01/26**	**02/17/27**
176	180	East - Install Structural Soils	9d	10/01/26	10/13/26
177	179	East - Install Irrigation Main	8d	12/07/26	12/16/26
178	185	East - Install Irrigation Controller	3d	12/17/26	12/21/26
179	186	East- Amend Soil Planting Areas	16d	01/05/27	01/26/27
180	0196	East - Install Turff	15d	12/17/26	01/11/27
181	184	East - Install Tress	6d	01/27/27	02/03/27
182	182	East - Install Shrubs	8d	01/27/27	02/05/27
183	183	East - Install Drainage Rock	6d	01/27/27	02/03/27
184	181	East - Place DG	8d	02/08/27	02/17/27
185	**0178**	**AMENITIES**	**88d**	**10/30/26**	**03/09/27**
186	**144**	**WEST AMENITIES**	**17d**	**10/30/26**	**11/23/26**
187	146	West - Clean Sidewalks	5d	10/30/26	11/05/26
188	145	West - Install Site Amenities	12d	11/06/26	11/23/26
189	**165**	**EAST AMENITIES**	**14d**	**02/18/27**	**03/09/27**
190	166	East - Clean Sidewalks	6d	02/18/27	02/25/27
191	167	East - Install Site Amenities	8d	02/26/27	03/09/27
192	**187**	**FINAL INSPECTIONS**	**141d**	**08/19/26**	**03/11/27**
193	189	West Canopy Final Inspection	2d	08/19/26	08/20/26
194	191	Restroom Final Inspection	2d	10/12/26	10/13/26
195	192	South Canopy Final Inspection	2d	10/19/26	10/20/26
196	190	East Canopy Final Inspection	2d	09/01/26	09/02/26
197	193	North Canopy Final Inspection	2d	09/17/26	09/18/26
198	188	West Site Final Inspection	2d	11/24/26	11/25/26
199	194	East Site Inspection	2d	03/10/27	03/11/27

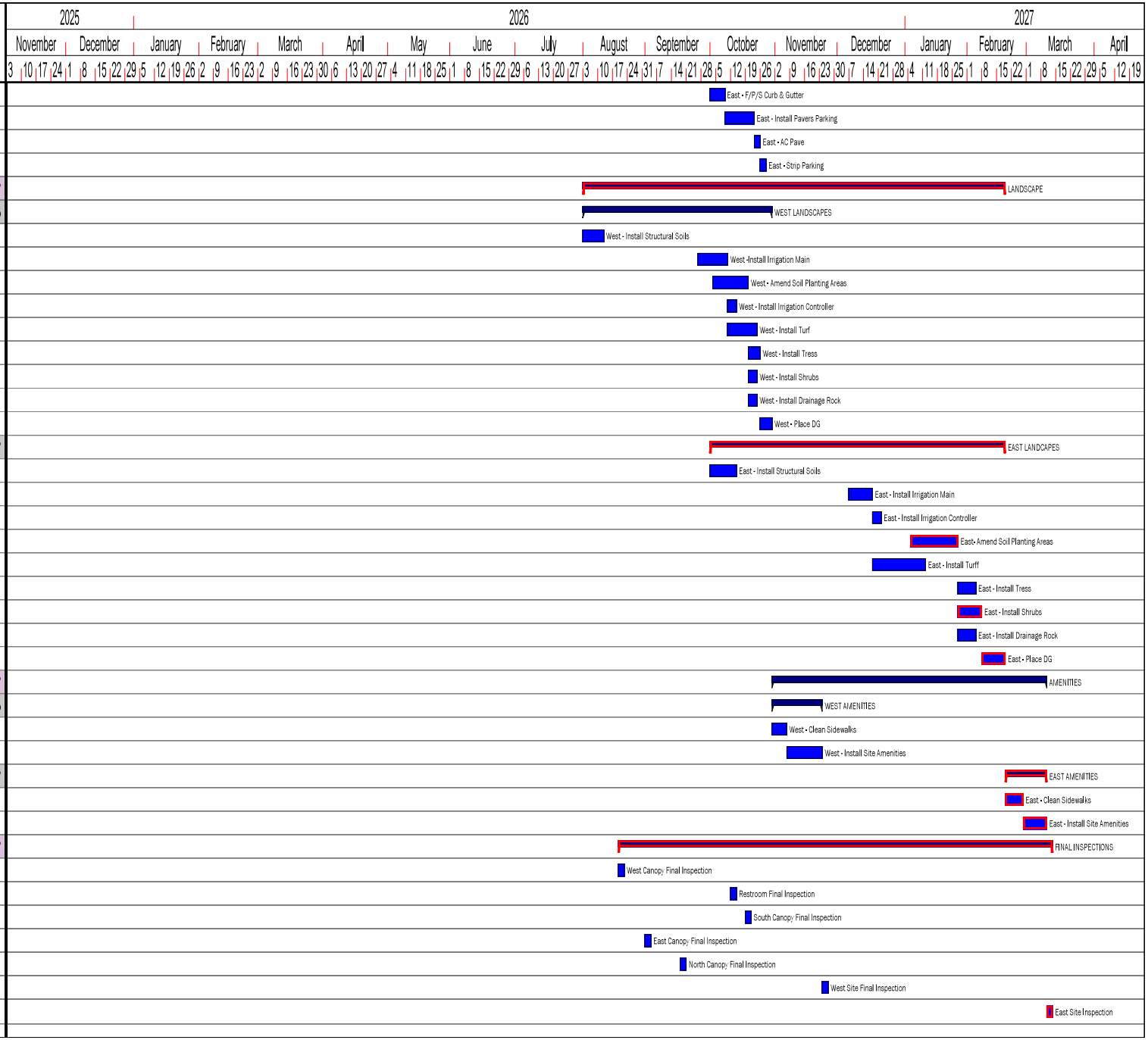

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EXHIBIT E

SUBCONTRACTOR DOCUMENTS WITH CM@RISK

Any subcontractor assumptions, clarifications, exclusions, terms & conditions, signature blocks, etc. included are strictly between the CM@RISK and their subcontractors, and do not apply to the Agreement between the CM@RISK and the City.

SUBCONTRACTOR'S LIST FORM

If CM@Risk intends to subcontract any portion of this Agreement, the CM@Risk must submit the name, address, and contractor's license number (if applicable) of each subcontractor, including the work component of such subcontracting. Include the form with the bid submittal documents. CM@Risk may make multiple copies of this form as needed.

Company Name:	Dickens Demolition
Contact Name:	Corey Kotrys
Contact Email:	ckotrys@dickensquality.com
Contact Phone:	602-686-0190
Work Component:	$159,980.00
Percentage of Total Work Performed:	0.89%

Company Name:	Spartan Site/CIP Concrete & Pavers
Contact Name:	Matt Sheets
Contact Email:	matt@spartanconcrete.com
Contact Phone:	602-358-4727
Work Component:	$2,339,114.50
Percentage of Total Work Performed:	13.01%

Company Name:	Siteworks Landscaping
Contact Name:	Cole Malham
Contact Email:	colemalham@siteworks.net
Contact Phone:	480-773-5267
Work Component:	$1,612,539.00
Percentage of Total Work Performed:	8.97%

Company Name:	5 Guys Roofing
Contact Name:	Jesse Stowell
Contact Email:	jesse@fiveguysroofing.com
Contact Phone:	480-203-4011
Work Component:	$168,655.00
Percentage of Total Work Performed:	0.94%

Company Name:	Castle Steel
Contact Name:	Russ Trojan
Contact Email:	rtrojan@castlesteelinc.com
Contact Phone:	602-243-2766
Work Component:	$1,713,177.00
Percentage of Total Work Performed:	9.53%

Company Name:	Hawkeye Electric
Contact Name:	Pat Tilton
Contact Email:	pat@hawkeyeelectric.com
Contact Phone:	602-574-2977
Work Component:	$1,710,500.00
Percentage of Total Work Performed:	9.51%

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EXHIBIT F

GIS / GPS DATA DELIVERY REQUIREMENTS

N/A

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EXHIBIT G

SUBCONTRACTOR DOCUMENTS WITH CM@RISK

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DQD
DEMOLITION

Proposal

Date: October 8, 2025
Attention: Willmeng – Sam Dul
Project: Dr. AJ Chandler Park 90% GMP
DQD will provide labor and all necessary equipment to accommodate the following:

- **Demolition and the removal of:** curbs, sidewalks, stairs, canopies, buildings, seat walls, trench drains, site/retaining walls, signage, fountains/piping, sump structure, fencing, light poles/bases, bollards, planter pots, statues, junction boxes, and trees noted to demo on landscape. This bid includes an asbestos survey, NESHAP, necessary equipment, hauling, labor and supervision. This job will be performed This job will be performed Monday through Friday during the hours necessary to meet your schedule **Please see items not included.**

- **Items not included:** taxes, bonds, permits, water supply, PAVERS, engineered demo plans, temp fence, traffic control, layout, X-ray/GPR, striping obliteration, hazardous materials, MP&E cutting/capping, and utility abandonments.

The above project will be completed in an efficient and professional manner for the sum of: $159,980.00

Alternate:
Salvage Pavers: Add $35,000.00
Demo Pavers: Add $30,000.00

Pricing will remain in effect for **30 (thirty)** days from the above date. DQD assumes all salvage rights on the above project. Due to the current federal laws and regulations, the above project cannot, and will not proceed without a proper hazardous materials survey on file at the office of DQD. If the above project involves any structural removal, a ten-day NESHAP notification must be filed with the county. DQD will be happy to assist the General Contractor/Building Owner in any way possible to help expedite necessary testing or notification requirements.
This proposal is based on 1 mobilization. Additional phases will be charged at $2,500.00 each.
Any alterations or deviations from the specified scope of work will be completed upon written consent from authorized personnel. This proposal shall become part of the contract document and by signing you agree to all conditions listed within.

Craig Kotrys – 602-686-0190

Accepted by:

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DQD DEMOLITION

1111 N. 19th Avenue, Phoenix, Arizona 85009 (602) 258-8088 Fax (602) 258-8139
www.dickensquality.com
ROC 123622

Additional scope dollars carried for:
- Make safe prior to demo
- Soft dig to locate all utilities
- Locater Utility plan
- Tree demo cost due to no salvage
- Traffic Control

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SiteWorks

2915 W. Fairview Street
Chandler, Arizona 85224
P: 480-820-1600
F: 480-820-1606

To:	Willmeng Construction	**Contact:**	Sam Dul
Address:	Phoenix, AZ	**Phone:**	
		Fax:	
Project Name:	DR AJ Chandler Park - 90%	**Bid Number:**	10/8/2025
Project Location:	Arizona Avenue, Chandler, AZ	**Bid Date:**	10/8/2025

Line #	Item #	Item Description	Estimated Quantity	Unit	Unit Price	Total Price
01-Irrigation						
	001	Backflow	1.00	EACH	$5,959.00	$5,959.00
	001.5	Hand Digging At Existing Trees New Irrigation For Existing Trees	1.00	LS	$6,234.00	$6,234.00
	002	Mainline Sleeves	2,600.00	LF	$5.70	$14,820.00
	003	Mainline Pipe	1,600.00	LF	$5.10	$8,160.00
	004	Master Valves	2.00	EACH	$2,233.00	$4,466.00
	005	Air Relief Valve	1.00	EACH	$1,431.00	$1,431.00
	006	Gate Valve-2"	3.00	EACH	$407.00	$1,221.00
	007	Drip RCV 1" Called Out IVM Solenoid Not Compatible With Baseline Controller	24.00	EACH	$1,058.00	$25,392.00
	008	Turf RCV-1"	15.00	EACH	$711.00	$10,665.00
	009	Lateral Pipe Drip	7,020.00	LF	$2.40	$16,848.00
	010	Lateral Pipe Turf	1,660.00	LF	$3.00	$4,980.00
	011	Controller Wire	3,200.00	LF	$0.44	$1,408.00
	012	Emitters-Multi	1,050.00	EACH	$26.50	$27,825.00
	013	Emitters-Pots	75.00	EACH	$13.00	$975.00
	014	Medium Rotor	19.00	EACH	$90.00	$1,710.00
	015	Spray Heads	131.00	EACH	$39.00	$5,109.00
	016	Flush Valve	41.00	EACH	$65.00	$2,665.00
	017	Mainline Stub-Out	5.00	EACH	$283.00	$1,415.00
	018	Controllers **Need More Specs/Details For Controller, Bid Reflects Assumptions Of What Is Needed**	2.00	EACH	$14,423.00	$28,846.00
	019	Grounding Rod	12.00	EACH	$368.00	$4,416.00
			Total Price for above 01-Irrigation Items:			**$174,545.00**
02-Grading						
	020	Fine Grading	1.00	LS	$17,308.00	$17,308.00
			Total Price for above 02-Grading Items:			**$17,308.00**
03-Dust Control						
	021	Dust Control	60.00	DY	$694.00	$41,640.00

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				Total Price for above 03-Dust Control Items:	**$41,640.00**

04-Plant Materials

022	Root Barriers	264.00	EACH	$131.00	$34,584.00
023	60"-Trees (Specimen Tree)	1.00	EACH	$12,900.00	$12,900.00
024	48"-Trees NOTE: 48" Box Alba Fruitless Not Available In 48" Box At Time Of Bid, Assumes Historical 48" Box Pricing	58.00	EACH	$2,640.00	$153,120.00
025	36"-Trees	88.00	EACH	$989.00	$87,032.00
026	24"-Trees	13.00	EACH	$340.00	$4,420.00
027	15g Accents	78.00	EACH	$196.00	$15,288.00
028	05g-Accents	78.00	EACH	$52.50	$4,095.00
029	10g-Shrubs Priced As Allowance Only, Not Available At Time Of Bid.	323.00	EACH	$193.00	$62,339.00
030	05g-Shrubs	1,439.00	EACH	$32.00	$46,048.00
				Total Price for above 04-Plant Materials Items:	**$419,826.00**

05-Inerts

031	1-01 1/2" (Screened) Express Gold @ 2" Depth	13,365.00	SF	$1.30	$17,374.50
032	1-02 1/4" (Minus) Express Gold Stabilized @ 2" Depth W/ 4" ABC	905.00	SF	$5.60	$5,068.00
033	1-03 Swale Rock 6-8" Express Gold @ 4" Depth	3,330.00	SF	$3.20	$10,656.00
034	1-04 Swale Rock 3" (Minus) Express Gold @ 3" Depth Not Available At Time Of Bid	3,955.00	SF	$1.90	$7,514.50
				Total Price for above 05-Inerts Items:	**$40,613.00**

06-Artificial Turf

035	1-19 Artificial Turf	1,900.00	SF	$18.00	$34,200.00
036	1-20 Artificial Turf @ Play Mound	246.00	SF	$18.00	$4,428.00
037	1-21 Artificial Turf @ Fall Surface	525.00	SF	$18.00	$9,450.00
				Total Price for above 06-Artificial Turf Items:	**$48,078.00**

07-Flagstone

038	1-22 Flagstone W/ DG Jointing	350.00	SF	$95.00	$33,250.00
039	1-22 Flagstone W/ Stabilized Aggregate Jointing	120.00	SF	$98.00	$11,760.00
040	1-22 Flagstone In Concrete **NOTE: Siteworks To Provide Flagstone To Be Installed By Others**	30.00	SF	$20.00	$600.00
				Total Price for above 07-Flagstone Items:	**$45,610.00**

08-Mow Curb

041	**EXCLUDED Curbing For 2-01, 2-02, 2-03**	0.00	LF	$0.00	$0.00
				Total Price for above 08-Mow Curb Items:	**$0.00**

10-Soil

043	8-02 Open Spaces Amended Soil @ 18" Depth **Excludes Excavation**	1,215.00	CY	$91.00	$110,565.00
044	8-03 CU Structural Soil Supply And Install	3,760.00	SF	$35.50	$133,480.00

Line #	Item #	Item Description	Estimated Quantity	Unit	Unit Price	Total Price
		Excludes Excavation				
				Total Price for above 10-Soil Items:		**$244,045.00**
11-Sod						
	045	8-04 Sod-Sand Based Tahoma 31 On 6" USGA Sand Bed Excludes Excavation Non-Overseeded	11,270.00	SF	$3.50	$39,445.00
				Total Price for above 11-Sod Items:		**$39,445.00**
12-Strata Vaults						
	046	8-05 **Strata Vault** Construction Includes: AB Subbase @ 4" Depth Under Strata Vault Base AB Subbase @ 4" Depth Above Strata Vault Base (**Sand Leveling Course By Paver Installer**) StrataVault Cell System (Excludes Invisigrate System, Not Specified Or Shown) Amended Lightweight Soil Infill @ 32" Depth **EXCLUDES:** **Excavation** **Sand Leveling Course** **NOTE: MFG's Website Recommends A Drainage System Tying Into City Storm Drain, Our Pricing Excludes This.** **NOTE: PER PLAN DETAIL USING STRATAVAULT SYSTEM! DETAIL AND MANUFACTURER CALLOUTS CONTRADICT**	1.00	LS	$277,400.00	$277,400.00
				Total Price for above 12-Strata Vaults Items:		**$277,400.00**
13-Grates						
	048	5-01 Jonite Tree Grates **NOTE: Frames Will Need To Be Installed By Concrete Sub At Time Of Pour.**	29.00	EACH	$1,391.00	$40,339.00
	049	3-03 Urban Accessories Tree Guard	13.00	EACH	$6,500.00	$84,500.00
				Total Price for above 13-Grates Items:		**$124,839.00**
14-Pottery						
	050	5-25 Landscape Forms Pots 36"	10.00	EACH	$2,222.00	$22,220.00
	051	5-26 Landscape Forms Pots 48"	2.00	EACH	$3,585.00	$7,170.00
	052	5-27/31 QCP Planters Included Below 1 Ea. QPEBBLE7-24 1 Ea. QPEBBLE2-36 2 Ea. QPEBBLE3-42 1 Ea. QPEBBLE5-56 5 Ea. QRCAL4848PLC	10.00	EACH	$3,480.00	$34,800.00
				Total Price for above 14-Pottery Items:		**$64,190.00**
15-Maintenance						
	053	90 Day Maintenance And 2 Year Warranty	1.00	LS	$75,000.00	$75,000.00
				Total Price for above 15-Maintenance Items:		**$75,000.00**
				Total Base Bid Price:		**$1,612,539.00**

Line #	Item #	Item Description	Estimated Quantity	Unit	Unit Price	Total Price
Alternate						
	054	P&P Bond - If Required (1.44%)	1.00	LS	$27,900.00	$27,900.00
	055	Textura Fees	1.00	LS	$4,000.00	$4,000.00
	500	8-05 **Soil Cell - URBAN FOREST** Construction Includes: **On Compacted Subgrade (By Others)** Drain Stone Backfill On Top @ 6" Depth (**Sand Leveling Course By Paver Installer**) Drain Backfill On Side @ 12" Depth Soil Cell System Per Ferguson/Urban Forest Amended Lightweight Soil Infill @ 32" Depth Root Barriers Drainage Per Tree In Area Per Detail Exhibit Filter Fabric **EXCLUDES:** **Excavation** **Sand Leveling Course** **Drainage Pipe Storm Drain Tie-in If Needed** **NOTE: PER FERGUSON SUPPLEMENTAL DETAIL REV DATE 10/2/25. INCLUDES ONLY "SYSTEM 1" AREA PER INSTRUCTION**	1.00	LS	$271,400.00	$271,400.00

Total Price for above Items: $303,300.00

Notes:

- All pricing/quantities per the "9/12/2025 - 90% Permit Submittal" Landscape Plans.
- This proposal excludes all pavers, hardscape, 18" drainage stone under permeable pavers, all excavation, site furnishings, electrical, all metals except for tree grates and tree guards (excludes canal grates).
- This proposal excludes all site furnishings, except for planter pots, tree grates and tree guards.
- SiteWorks will recieve the site, clean, free of construction debris and at required subgrade elevation, ready to receive topsoil or mulch layer. All other areas shall be received within 1/10' of finish grade.
- The jobsite shall be readily accessible to our construction equipment.
- This proposal is limited to the items clearly identified on this bid form. Any other specific items not identified herein should be deemed excluded.
- Electrical supply (120v) to the location and final hookup of the automatic irrigation controller to be furnished by others
- No removal, repair, replacement or protection of exsisting landscape or irrigation is included in this proposal.
- Removal of hard dig materials, (materials that requires larger than a 40hp trencher or rubber tired backhoe) is not included in this proposal. Such material, if encountered shall be removed and charged for on a T & M basis.
- All harscape elements to be installed by others.
- No import, export or translocation of soil is included in this proposal. All planting excavation to be spread onsite.
- No water meter or water meter fees are included in this proposal.
- This proposal is based on all work being performed in one continuous move. Any additional moves may require an additional mobilization fee.
- All permits, sales taxes and fees are excluded from the scope of this proposal.
- Siteworks will have access to the site prior to paving or wall construction to allow for the installation of sleeves. No cutting or patching of concrete or asphalt paving is included. No boring, jacking or jetting under pavements is included.
- Traffic and pedestrian control measures, if required are to be set up and maintained by others.
- SiteWorks is not responsible for underground utilities not buried to specific depth or clearly marked.
- All costs for water during construction and throughout the maintenance period are excluded.
- All work under this proposal to be performed during regular working hours.
- Material pricing good for 90 days. Any material cost increases between now and actual start of landscape to be passed onto owner without markup.

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Additional scope dollars carried for:
•Tree PIP Mods or Maintenance
•Strata Vault coordination with utilities or other site conditions if needed
•Extra mobilizations
•Sleeving/boring under pavements where early access isn't possible.
•Coordination with concrete and other site trades
•Plant availability changes, substitutions, or price escalation.
•Additional staking, guying, and plant protection if needed
•Access limitations requiring re-grading or alternate routes.

ACCEPTED: The above prices, specifications and conditions are satisfactory and hereby accepted. **Buyer:** _____ **Signature:** _____ **Date of Acceptance:** _____	**CONFIRMED:** **SiteWorks Landscape Development** **Authorized Signature:** _____ **Estimator:** Jmeyer jmeyer@siteworksllc.net

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CASTLE STEEL INC.

3828 N. 35th Ave. Phoenix, Az. 85017 (602) 243-2766

R.O.C. # 203912
City of Phx. Approved Fabricator
Maricopa Cnty Dust Reg. # SC0800100

Attention: Estimating
Company: Willmeng Construction
RE: Dr. AJ Chandler Park
Date: 10/8/2025 REVISED 10.10.25

Allow us to tender our quotation on this project, subject to the following Inclusions, Exclusions, Terms and Conditions:

Scope of Work

We propose to furnish the following labor and equipment to fabricate and erect the following in accordance with issued drawings: No specifications, except as may be noted below in our Inclusions, Exclusions and Terms and Conditions.

We Acknowledge Addenda (0)

This offering includes the following: ***Quote No. 2837*** ***REVISED 10.10.25***

1. Columns Excluding caissons (F.O.B. ONLY)
2. Wide flange and HSS beams
3. Ledger
4. Deck
5. Trusses
6. Louvers
7. Wall cap plates (F.O.B. ONLY)
8. Wire mesh framed doors and partitions
9. Roof frames at drains (4 total)
10. Galvanized swale bridge 5/LS503 (7 total)
11. Powder coated garden fence 6/LS503
12. Trench grate 5/LS504 (4 total, F.O.B. ONLY)
13. Lantern column 2/A804 (5 total, F.O.B. ONLY)
14. One coat of standard shop primer
15. Detailing
16. FOB Castle Steel, Inc. with freight allowed to the jobsite

Clarifications:

1. The design team is fully responsible for any errors, omissions, conflicts, violations and improper use of material, if shown on bid documents. Castle Steel, Inc has prepared this quotation based on measured quantities as specifically shown on the drawings. If during the preparation of shop drawings we discover errors, omissions or conflicts that affect pricing. Castle Steel, Inc will immediately submit change orders relating to such incurred costs.
2. Castle Steel will not accept any penalties in any type or form due to impedances in schedule related to unapproved change orders or other trades. Castle Steel Inc is not responsible for these impedances nor will it accept responsibility.
3. Castle Steel Inc does not assume or interpret locations of details not shown or designed on the drawings. If a details is not provided at time of bid this detail is not included in this proposal unless specified above. The responsibility of the design of the building is the responsibility of others and all details not referenced, shown or designed are not included. If these details are added at a later date they will be added into the base scope of work via change order. No work will progress until these change orders are approved by the proper personnel.

This offering excludes the following:

SPECIFIC EXCLUSIONS:

1. Davis Bacon Wages or Terro wages
2. All wrought iron, stainless steel, or aluminum
3. All fencing/gates not listed above
4. All caissons and associated cages

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CASTLE STEEL INC.

3828 N. 35th Ave. Phoenix, Az. 85017 (602) 243-2766

5. All demolition and shoring
6. All engineering
7. All of details on sheets LS504, LS505, LS506, LS507 & LS508
8. Insect screen and attachment at louvres
9. Sliding restroom door hardware
10. Wall scupper box 8 & 9/A800
11. Shade Structure per detail 3/LS505 (See add alternate allowance)

GENERAL EXCLUSIONS: (unless specifically included elsewhere).

1. Any item not identified in our inclusions
2. All bike racks
3. Access doors, panels, and hatches
4. Anchorage devices for other trades
5. Backup plates for other trades
6. Barricades, fences, lights, and shoring
7. Any other devices necessary for safety of other than our workmen
8. Bolts, wood to wood, wood to masonry, other trades
9. Bonds (cost of) unless otherwise noted
10. Bituminous coatings
11. Brackets, hangers, and frames for other trades
12. Building permits, course of construction insurance
13. Burglar bars
14. Carport canopies
15. Cast iron items, as well as all other non-carbon steel items
16. Catch basins
17. Caulking and sealant
18. Chain link items
19. Chrome items closet rods
20. Cold formed steel (metal studs)
21. Simpson clip

A. This proposal is subject to acceptance within **5** days from the date tendered and shall be subject to satisfactory arrangement of details. The Code of Standard Practice of the Americans Institute of Steel Construction, Ninth Edition, 1989, is hereby made a part of this proposal and shall govern in all matters to which it is applicable not otherwise provided herein.

B. It is understood that in the event of errors, nonconforming material/workmanship, or installation difficulties being experienced with items provided hereunder, we shall be properly notified in writing, given reasonable time to inspect as to the validity of such claims and a reasonable time to repair. In absence of proper notice as described above, we will accept no responsibilities for such claims.

C. The inability of the contractor to be paid shall not be grounds for withholding monthly payments or final retention.

D. Due to availability and extreme volatility in the steel market, pricing is based on current steel pricing and is subject to availability of material and Mill allotments. Upon award availability and pricing will be reviewed for acceptance based on current market conditions.

We propose to provide this project as described above,

For the price of **$1,713,177.00** excluding all tax.

Additional scope dollars carried for:

- Steel Detailing changes during the shop drawing process.
- Sequencing modifications to coordinate with wood ceilings and metal panels.
- Added layout/tolerance work at decorative connections and reveals.
- Specialty fastening/backing required that is not yet defined
- Additional or different lifts/equipment time due to ground conditions
- AESS budget

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CASTLE STEEL INC.

3828 N. 35th Ave. Phoenix, Az. 85017 (602) 243-2766

Breakout for Budget Purposes;
West Canopy: $302,183.00
East Canopy: $302,178.00
North Canopy: $330,812.00
South Canopy: $275,406.00
Restroom: $240,433.00
Site: $262,165.00

Add Alternate 001:
This alternate is purely an allowance and budget until final engineered drawings are provided. This alternate will add the swing canopy structure excluding the swings and support of the swings to the base bid price. This alternate will allow for two locations. Please add **$52,225.00** to the base bid price.

Add Alternate 002:
This alternate is an allowance for the two mockups shown on A020. This is purely an allowance number for these structures, till a final structural design can be provided clearly showing the scope of materials needed. Please add **$73,000.00** to the base bid price.

Add Alternate 003:
This alternate is an allowance for assistance is placing the columns on the west and east canopies. This excludes any caisson work drilling or concrete work. Castle Steel will set and brace the column. If the columns is knocked of moved by any other trade after this has been performed it is the liability of others, and will be an additional cost to repair. Please add **$6,405.00** to the base bid price

Add Alternate 004:
This alternate is an allowance to supply embeds for the top of walls and puddle weld in the field all plates as noted on note 7 of out inclusion in the field. Please add **$33,295.00** to the base bid price

Add Alternate 005:
This alternate is an allowance to place the Lantern Columns in the hole for the caisson and brace in place. If any other trade knocks or moves the placed post, it will be an additional cost to repair. This excludes the caisson, drilling, concrete and any other associated work. Please add **$1,196.00** to the base bid price

Add Alternate 006:
This alternate is a deduct to remove the trench drain grating per note 12 of our inclusions above. Please deduct **<-$3,904.00>** from the base bid price

Add Alternate 007:
This alternate is an allowance to add the plate scupper boxes per details 8 & 9/A800. Please add **$892.00** to the base bid price

Thank you for the opportunity to quote on this project.

Sincerely,

Larry Capriotti
Castle Steel, Inc.
lcapriotti@castlesteelinc.com

AISC CERTIFIED FABRICATOR & ERECTOR

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/19/2025
L6285
Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Ave. Chndl 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount

EXCLUSIONS:
Demolition, Haul spoils offsite, Over-ex and re-compaction
Engineered fill, Subgrade prep, Termite control,
Joint Sealants, Testing, Permits, Surveying,
As-Built Surveying, Barricades, Road Closures, Flagmen
Liquidation Damages
Furnish micellaneous metals, including base plates,
anchor bolts, pipe bollards, canopy poles, light poles,
light totem poles & Picnic furniture

INCLUSIONS:
Layout from Survey, excavate & backfill shallow foundations
place new footings, stockpile spoils on site, place new concrete
& pavers according to finish

Bid from 90% plan dated 9/12/2025, any revisions made after
this date could result in an extra charge

Bids are good for 90 days from date of issue.

Subtotal	
Sales Tax	0.00
Total	**$0.00**

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from the above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workman's Compensation Insurance.

Authorized Signature _____

Date _____

Acceptance of proposal The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Authorized Signature _____

Date _____

Phone: 602 268-2775
Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/23/2025
L6298
Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Ave. 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
Canopy Foundation and Floors			
Price includes			
Slab 4" concrete on 4" abc w/ 6x6x10x10 WWF			
Wall footers per plan			
Block stem by others- 4" concrete stem deleted			
Bath House	1	28,000	$28,000.00
South Canopy	1	33,000	$33,000.00
North Canopy 2 buildings	1	61,000	$61,000.00
Steel Columns provided & set by others			
Vapor Barrier if required add 5500.00			
Concrete Polishing	1	21,000	$21,000.00

Additional scope dollars carried for:
- Additional mobilizations
- Out-of-sequence pours to support other trades
- Added forming/layout at material transitions
- Coordination impacts when multiple trades overlap
- Subgrade/utility adjustments (extra AB or repairs)
- Short-load fees for split pours (Color)
- Added concrete pour protection
- Rework from shifting elevations or grade tweaks.
- Extra finishing time in high-detail or curved areas.
- Ice for concrete during hot months
- Light plants for early morning pours

Bids are good for 90 days from date of issue.

Subtotal	$143,000.00
Sales Tax	0.00
Total	**$143000.00**

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from the above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workman's Compensation Insurance.

Authorized Signature _____

Date _____

Acceptance of proposal The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Authorized Signature _____

Date _____

Phone: 602 268-2775
Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

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Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/19/2025

L6278

Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Ave. Chandler 85284
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
Light Pole Base (type 1) 6' tall x 30" diameter	13	2000	$26,000.00
Light Pole Base (type 2) 4'6" Tall x 30" diameter	22	1500	$33,000.00
Centenary Base (AKA string lighting poles)- no detail	0	0	
By Others			

Bids are good for 90 days from date of issue.

Subtotal	$59,000.00
Sales Tax	0.00
Total	**$59000.00**

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from the above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workman's Compensation Insurance.

Authorized Signature _____

Date _____

Acceptance of proposal The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Authorized Signature _____

Date _____

Phone: 602 268-2775
Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/19/2025

L6274

Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Avenue, Chndl 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
Smooth Slip Dowels (12")	1	20000	$20,000.00
8" TD	1	20000	$20,000.00
Saw Cut	1	10000	$10,000.00
Pump allowance	1	20000	$20,000.00

Bids are good for 90 days from date of issue.

Subtotal	$70,000.00
Sales Tax	0.00
Total	**$70000.00**

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from the above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workman's Compensation Insurance.

Authorized Signature _____

Date _____

Acceptance of proposal The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Authorized Signature _____

Date _____

Phone: 602 268-2775
Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/19/2025

L6284

Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Avenue Chndl 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
Mockups			
Flatwork- park and buildings	1	7500	$7,500.00
Seat Wall	1	5000	$5,000.00
Eco Pan	1	6000	$6,000.00
Bond rate 2% of total, Budgetary	1	50000	$50,000.00

Bids are good for 90 days from date of issue.

Subtotal	$68,500.00
Sales Tax	0.00
Total	**$68500.00**

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from the above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workman's Compensation Insurance.

Authorized Signature _____

Date _____

Acceptance of proposal The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Authorized Signature _____

Date _____

Phone: 602 268-2775
Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/19/2025

L6284

Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Avenue Chndl 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
Mockups			
Flatwork- park and buildings	1	7500	$7,500.00
Seat Wall	1	5000	$5,000.00
Eco Pan	1	6000	$6,000.00
Bond rate 2% of total, Budgetary	1	50000	$50,000.00

Bids are good for 90 days from date of issue.

Subtotal	$68,500.00
Sales Tax	0.00
Total	**$68500.00**

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from the above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workman's Compensation Insurance.

Authorized Signature _____

Date _____

Acceptance of proposal The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Authorized Signature _____

Date _____

Phone: 602 268-2775
Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/19/2025

L6272

Proposal

Willmeng
Company

Dr. AJ. Park
Job Name

3 S. Arizona Avenue, Chndl 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
1-10 Pedestrian Concrete (5/LS501)			
4000 PSI - Acid Etch (#5) NO COLOR	730	17.50	$12,775.00
6" ABC , 4" Concrete			
1-11 Pedestrian Concrete (5/LS501)			
4000 PSI - Exposed Aggregate (#75) NO COLOR	1300	17.50	$22,750.00

Bids are good for 90 days from date of issue.

Subtotal	$35,525.00
Sales Tax	0.00
Total	**$35525.00**

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ROC116621 (Commercial)
ROC091255 (Residential)

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Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/19/2025
L6282
Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Avenue Chndl. 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
1-16 Permeable Pavers (on soil cell) 3/LS504 4x8x80mm 75%Grind / 25% Shotblast STANFORD SAND 4" ABC, 2" Mortar Sand	4400	16.25	$71,500.00
Soil Cell & Backfill by others 1-18 Detectable Warning Pavers	450	100	$45,000.00
1-22 Flagstone Steps 3/LS502 Provided by the landscaper, price only includes setting in concrete (1-08)	1	1000	$1,000.00

Bids are good for 90 days from date of issue.

Subtotal	$117,500.00
Sales Tax	0.00
Total	**$117500.00**

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Authorized Signature _____

Date _____

Phone: 602 268-2775
Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/22/2025

L6294

Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Avenue Chndl, 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
Ping Pong Table continuous footer (2 tables)	1	3750	$3,750.00
5-27- Planter Pot footings (4 each)	1	1500	$1,500.00

Bids are good for 90 days from date of issue.

Subtotal	$5,250.00
Sales Tax	0.00
Total	**$5250.00**

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Authorized Signature _____

Date _____

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Authorized Signature _____

Date _____

Phone: 602 268-2775
Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/19/2025
L6280
Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Avenue Chndl. 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
Remove existing pavers @ parking stalls	8700	5	$43,500.00
Re-install pavers @ parking stalls (City has 7 extra pallets)	6700	10	$67,000.00
6"ABC, 2" Mortar sand- 1/LS502			
Pavers with white stripping- dispose of			
Concrete under pavers - vehicular			
6"ABC , 6" Concrete, 6x6x#10 wire mesh	0	0	
Per Willmeng- already under existing pavers			

Spartan Concrete to remove and re-palletize existing pavers
Dirt Grading & haul off by others

Bids are good for 90 days from date of issue.

Subtotal	$110,500.00
Sales Tax	0.00
Total	**$110500.00**

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from the above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workman's Compensation Insurance.

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Date _____

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Authorized Signature _____

Date _____

Phone: 602 268-2775
Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/19/2025
L6277
Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Ave. Chandler 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
5-16 Removable Bollard Footer Bollards provided by others	26	250	$6,500.00
Canopy Footers, include coring of holes, furbish steel, place concrete, set jigs (drilled)	16	5700	$91,200.00
5-17 Canopy Spread Footers furbish steel, place concrete, set jigs (provided by GC) * *Dirt haul off by others, Jigs provided by others, footers will need to be surveyed for height and locations	32	1200	$38,400.00
5-41 Light Totem Footers, includes coring of holes, furbish steel, place concrete, set jigs * *Dirt haul off by others, Jigs provided by others, footers will need to be surveyed for height and locations Jigs for the Canopy Poles and Lantern Poles bases provided by others, the poles provided and set by others.	5	5000	$25,000.00
5-43- Paving Stud- Kent Tactile Warning stud or equal Provided by Spartan **Grade +/-1" by GC**	67	175	$11,725.00

Bids are good for 90 days from date of issue.

Subtotal	$172,825.00
Sales Tax	0.00
Total	**$172825.00**

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Authorized Signature _____

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Authorized Signature _____

Date _____

Phone: 602 268-2775
Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/20/2025
L6292
Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Ave. Chndl 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
2-06 Seat Walls Sand Blast KAILUA			
Forming , concrete placement & steel by Spartan (curved) refer to page 1/LS503	50	450	$22,500.00
Excavation & Backfill by others			
2-07 Retaining Seat Wall Sand Blast NO COLOR			
Forming, concrete placement & steel by Spartan (curved) refer to page 2/LS503	30	450	$13,500.00
Excavation & Backfill by others			

Bids are good for 90 days from date of issue.

Subtotal	$36,000.00
Sales Tax	0.00
Total	**$36000.00**

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Date _____

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Authorized Signature _____

Date _____

Phone: 602 268-2775
Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/19/2025

L6283

Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Ave. Chandler 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
3-01 Swale Bridge Footers	1	25,000	$25,000.00
Price includes, steel, concrete & jig setting			
Excavation and backfill by Spartan	1	5000	$5,000.00
Need Surveyed for height and location, jig provided by others			

Grade +/-1" by GC

Bids are good for 90 days from date of issue.

Subtotal	$30,000.00
Sales Tax	0.00
Total	**$30000.00**

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Phone: 602 268-2775
Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

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Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/23/2025
L6296
Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Ave. Chandler 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
5-01Tree Grates Curb- Acid Etch NO COLOR 8"x8" footer 8/LS506 Grate & Frame supplied by GC Spartan to set frame	9	500	$4,500.00
5-02 Grate @ Canopy Footing - -Acid Etch NO COLOR 7/LS506 Grate & Frame supplied by GC Spartan to set frame	20	500	$10,000.00
3-03 Tree Guard w/ Suspension System **Grate & Frame supplied by GC- footing only** **6/LS504**	13	500	$6,500.00
5-15- Bike Rack Vehicular Concrete- BY OTHERS	0	0	
Curb & Gutter Asphalt cut by others	313	35	$10,955.00
5-03- Tie Downs- set only only, tie downs provided	8	100	$800.00
5-19- Footers for umbrellas- jigs set by Spartan **Grade +/-1" by GC**	12	500	$6,000.00

Bids are good for 90 days from date of issue.

Subtotal	$38,755.00
Sales Tax	0.00
Total	**$38755.00**

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Phone: 602 268-2775
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ROC116621 (Commercial)
ROC091255 (Residential)

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/23/2025
L6295
Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Ave. Chndl 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
1-17 Truncated Domes- is concrete included in sq footage	400	100	$40,000.00
1-24 Trench Grate form and pour channel, grate by others	32	100	$3,200.00
2-01 Raised Concrete Header Acid Etch KAILUA			
6" x 8" deep w/ #4 rebar 18" continuous	240	50	$12,000.00
2-02 Raised ConcreteHeader@Parking Acid Etch NO COLOR			
6" wide x 18" deep w/#4 rebar continuous-	690	50	$34,500.00
2-03 Flush Concrete Header Acid Etch KAILUA			
8" wide x 8" deep w/ continuos #4 rebar-	412	35	$14,420.00
2-05 Turf Steps Acid Etch KAILUA			
2ft wide treads x 1ft deep (steel by Spartan per structural)	120	250	$30,000.00
Excavation for Turf Steps by Spartan			
2-08 Art Pedestal Acid Etch NO COLOR			
3ft circle x 18" deep w/ #4 rebar 18" O.C. both ways	3	600	$1,800.00
5-18 Shade Structure & Swing Footers 3LS505	12	350	$4,200.00
16"x16"x16" footer- Excavation by Spartan			
TBD Drain at Turf Steps- provided by Spartan- budgetary	50	450	$22,500.00
Connect to Storm Drain	1	500	$500.00

Grade +/-1" by GC

Bids are good for 90 days from date of issue.

Subtotal	$163,120.00
Sales Tax	0.00
Total	**$163120.00**

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Authorized Signature _____

Date _____

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Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/19/2025

L6271

Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 South Arizona Ave. Chndl 85524
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
1-05 Vehicular Concrete (4/LS501)			
4000 PSI - Exposed Aggregate (#75) NO COLOR			
6" ABC, 6" Concrete, 6x6x#10 wire mesh	1000	20	$20,000.00
1-06 Vehicular Concrete (4/LS501)			
4000 PSI - Acid Etch (#5) NO COLOR			
6" ABC , 6" Concrete, 6x6x#10 wire mesh	16000	20	$320,000.00
1-07 Vehicular Concrete (4/LS501)			
4000 PSI - Acid Etch (#5)Davis Color KAILUA (4lbs)			
6" ABC , 6" Concrete, 6x6x#10 wire mesh	3000	23	$69,000.00
1-08 Vehicular Concrete (4/LS501)			
4000 PSI - Exposed Aggregate (#75) Davis Cocoa			
6" ABC , 6" Concrete, 6x6x#10 wire mesh	4419	22	$97,218.00
1-09 Decorative Banding (4/LS501)			
4000 PSI - Acid Etch (#5) Davis Color KAILUA (4lbs)			
6" ABC , 6" Concrete, 6x6x#10 wire mesh	2800	50	$140,000.00
Additional Layout/Forming charge	1	10000	$10,000.00

Grade +/-1" by GC

Bids are good for 90 days from date of issue.

Subtotal	$656,218.00
Sales Tax	0.00
Total	**$656218.00**

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Authorized Signature _____

Date _____

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Authorized Signature _____

Date _____

Phone: 602 268-2775
Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

Docusign Envelope ID: 5637B5BF-5917-4A64-8B0C-CC1001809BAC

Spartan Concrete, Inc.

2811 E Jones
Phoenix, AZ 85040

10/29/2025
L6304
Proposal

Willmeng
Company

Dr. AJ Park
Job Name

3 S. Arizona Avenue, Chndl 85224
Job Address

E-mail

Phone Number

Description	Quantity	Unit Price	Amount
1-12 Vehicular Pavers (1/LS502)			
4x12x8cm 75% Grind, 25% Shotblast STANFORD SAND	13,457	17	$228,769.00
6" ABC, 6" concrete (sub-base) wire mesh 6x6x#10	13,457	12.50	$168,212.50
1-13 Pedestrian Pavers (9/LS501)			
4x12x8cm 75% Grind, 25% Shotbalst MOCHA	500	17	$8,500.00
6" ABC, 2" Mortar Sand			
1-14 Pedestrian Pavers (9/LS501)			
4x12x8cm Shotblast STANFOED SAND	2023	17	$34,391.00
6" ABC, 2" Mortar Sand			
1-15 Permeable Pavers (10/LS501)			
4x12x100mm AquaLina Shotblast	4,222	17	$71,774.00
18" #47 stone (grading by others, not included in price)	4,222	7	$29,554.00
# 8 or 9 (1 1/2" bedding and joint filler)	4,222	1.50	$6,333.00
Non Woven GeoTextile Filter Fabric	4,222	4	$16,888.00
4" high x 6" deep continuous footer- included in price			
Angle Iron @ Titan Bolt deleted per meeting @ Willmeng			
6" concrete w/Wire mesh- NO ABC- under vehicular pavers			
$10.50 sq ft x 13457 = 141,298.50			
Grade +/-1" by GC			

Bids are good for 90 days from date of issue.

Subtotal	$564,421.50
Sales Tax	0.00
Total	**$564421.50**

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Authorized Signature _____

Date _____

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Authorized Signature _____

Date _____

Phone: 602 268-2775
Fax: 602 268-2758

ROC116621 (Commercial)
ROC091255 (Residential)

PROPOSAL

Five Guys Roofing
1275 W Houston Ave.
Gilbert, Az 85233
Office: 480-892-5311
ROC#: 301076 - 301077

Estimator
Jesse Stowell
jesse@fiveguysroofing.com

Willmeng Construction
Willmeng Construction
, AZ

JOBSITE: 3 S Arizona Ave Chandler AZ 85225

Estimate #	73234
Date	10/13/2025

This represents our proposal to complete the work required at the address referenced above. This system will be installed as per the plans and manufacturer's recommendations.
Due to market volatility, increases in raw materials, and supply chain delays, we reserve the right to notify you of materials price increases. An increase from the original proposal will cover the additional cost only. Any increases help us ensure our commitment to providing the very best products and services to you.
Estimate valid for 15 days.

Specifications:

Description	Price
Polyurethane Foam Roof - Elastomeric Roof Coating (3 Gal / 100 Sq. Ft.) 5 Year Warranty (Labor and Materials) ***PREPERATION*** -All safety measures will taken and followed throughout the project -Parking will be blocked off in certain areas for safety and access -Apply a primer over the substrate as needed to improve adhesion -Mask and prepare walls, transitions and other effected areas for Foam application ***FOAM APPLICATION*** -Install 2" iso board as needed and fully adhere iso board with GAF flash pass adhesive -Install new 3x3x1/2" rise drip edge metal on all perimeter edges -Install 2"x4" blocking as needed -Install 1/2" cover board over the deck and iso. Adhere coverboard with GAF flash pass adhesive -Apply (closed cell) polyurethane roofing foam at the rate of 1 inch thickness. Add extra thickness of foam as needed over low areas and low cricket locations. Detail foam at all roof penetrations, AC units, edges, and parapet walls. -Add foam in the crickets to taper roof towards the drains ***COATING APPLICATION*** -Apply a base coat of white elastomeric coating over the new foam roof at the total rate of 1.5 gal per 100 sq ft. Apply in Color to be white. Detail coating around roof penetrations, edges, and parapet walls. -Apply a top coat of white elastomeric coating over the new foam roof at the total rate of 1.5 gal per 100 sq ft. Apply in Color to be white. Detail coating around roof penetrations, edges, and parapet walls. -Re-install any roof drain covers -Clean the work area locations and haul away project related debris -Issue a 5 year no leak warranty from 5 Guys Roofing. Includes 5 Guys Roofing workmanship warranty and manufacture product warranty -Includes free yearly roof inspection check up QUOTE TOTAL: $168,655	$168,655.00

Sub Total	$168,655.00
Total	$168,655.00

Recommendation*
Five Guys Roofing would recommend yearly inspections. Ask about our roof maintenance program and ForeverCare.
Addendums
Any additional work that is not outlined in this proposal must be contractually agreed upon before work is completed. A change order will be created.
Exclusions
This proposal excludes liability for materials & equipment not installed by us.

M O V I N G F O R W A R D . . .

Willmeng: Additional scope dollars carried for:
•Safety/Ladder inspection
•Roof Prep and Cleanup prior to roofing installation

Proposal are valid for 15 days.

Five Guys Roofing will not be held accountable for any damage as a result of water lines, electrical lines or gas lines not properly installed or from unprotected thermostat wires.

Finalizing the details – When proposal is approved, your estimator will reach out and make sure all details are finalized. If roofing materials and colors have not been selected you will be able to select them from the available options.

Scheduling – When details are finalized estimators will pass the project over to our scheduling/service manager who will review the specifications and schedule the appropriate crews to perform the work. They will send an email to you with the date and time the work is scheduled. If the project needs to be rescheduled, our Scheduling/Service manager will notify you via email.

Change Orders – In the event of a change, our project manager will notify the estimator. The estimator/project manager will reach out with necessary changes needed, and we will get approval from you before any additional work is done.

Final Job Walks – Upon completion of the project, our project/service manager, or Foreman, will perform a final job walk.

Invoice Payment – Invoices must be paid using cash, physical check or E-check to qualify for invoice pricing.

Payments can be made by:
- Mailing a check to our office
- ACH
- Dropping off payment at our Gilbert office
- Arranging for a Five Guys Roofing staff member to pick up the payment

Credit Card Payments:
To pay by credit card, call the office (480.892.5311). Credit card payments are subject to a 3.5% processing fee.

Warranty – All warranties become valid upon receipt of final payment.

Please review the warranty document upon delivery to ensure you understand what Five Guys Roofing covers, as there are limitations.

Accepted By: _____ Date: _____

Testimonials

"I have used hundreds of contractors and subcontractors in my life. Every single one of them has been late to appointments, and always over promise and under perform. This was the first time in 30 years I have seen a company show up exactly when they said they would be there, and do the work exactly as they said they would. I do not take that lightly. I would definitely recommend them to anyone." - CJ

"They came and did a wonderful job. When he first showed up he knocked on the door to tell me that he was here and was going to start. He was kind and a pleasure to talk to. After their quick work he knocked on the door to tell me that the work was completed and that an email of the invoice and pictures were sent via email. All in all great work!" - Vincent C

Accreditation's

- A+ Rating at the Better Business Bureau
- Tile Roofing Institute - Certified Installer -
- CARE: Center For The Advancement of Roofing Excellence
- HAAG Certified
- Member of: ARCA: Arizona Roofing Contractors Association

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HAWKEYE ELECTRIC INC

6100 W. ERIE ST
CHANDLER, AZ 85226
PHONE (480) 784.6800

PROPOSAL FOR ELECTRICAL SERVICES

Date: **10/27/2025** Reference: **DR. AJ CHANDLER PARK**

Transmitted to: **SAM DUL** From: **PATRICK TILTON**

Email: Direct: Email: pat@hawkeyeelectric.com

Company: **WILLMENG CONSTRUCTION** Cell: **602-574-2977**

WE PROPOSE TO FURNISH AND INSTALL ALL LABOR AND MATERIAL REQUIRED FOR A COMPLETE ELECTRICAL INSTALLATION IN ACCORDANCE WITH:

- [X] Plans and Specifications
- [X] Local Codes
- [X] Listed Clarifications
- [X] Comments Below

WE QUOTE ELECTRICAL / 16000 ELECTRICAL PLANS/SPECS

BASE BID AMOUNT	**$ 1,710,500.00**

Alternates:

1.	ALT ADD TO SUPPLY AND INSTALL LIGHTS ON TOTEM LANTERN (5) PER DETAILS E502	$ 157,500.00
3.	ALT ADD FOR TRAFFIC SIGNAL TS101/TS102 -BUDGET ONLY	$ 80,000.00

HAWKEYE AUTHORIZED SIGNATURE

PATRICK TILTON

1. **This proposal is firm for 30 days**
2. **Installation is guaranteed for 1 year**
3. **Mfgs standard warranties transfer to Owner upon substantial completion**

SPECIFIC INCLUSIONS:
FIRE ALARM -FLOW AND TAMPER SWITCH
RELOCATION OF APS TRANSFORMER & ELECTRICAL METER
INCLUDE NEW APS PRIMARY/SECONDARY TO NEW SES
GROUNDING
LIGHTING CONTROL PANELS AND DMX CONTROLS

SPECIFIC EXCLUSIONS:
CONCRETE POLE BASES
TOTEM -LANTERN STRUCTURES (5) PER EACH COST $31,500.00
WITH RGBW AND DMX CONTROLS

Item Description	INCLUDED	EXCLUDED
Permits		XXX
Sales Tax		XXX
Bond		XXX
Trenching	XXX	
Job Storage	XXX	
Job Office	XXX	
Overtime		XXX
Demolition		XXX
Dumpster For Demo		XXX
Primary Service	XXX	
Secondary Service	XXX	
Temporary Power	XXX	
Telco Service		XXX
Landscape Repairs		XXX
Concrete Pole Bases		XXX
Special Tools/Lifts	XXX	
Scaffolding for Elevator		XXX
Traffic Control		XXX

Item Description	INCLUDED	EXCLUDED
Switchgear	XXX	
Site Lighting	XXX	
Power Poles		XXX
Light Fixtures	XXX	
Light Pole Survey		XXX
Generator and ATS		XXX
Lighting Controls	XXX	
Concrete Utility Pads	XXX	
Conc Encasement		XXX
AC Unit Connections	XXX	
Receptacles		XXX
Fire Alarm J-boxes	XXX	
FA Drawings	XXX	
Asphalt/Conc Patch		XXX
Extend primary to site for temp. pwr		XXX
BDA Testing		XXX
BDA System		XXX

Item Description	INCLUDED	EXCLUDED
Coring Wall/Floor/Saw Cutting	XXX	
Security System Back Boxes		XXX
Voice/Data Cable and Termination		XXX
CCTV Cable/Termination (RG-6)		XXX
Data/Telco Stubs & Back Boxes		XXX
Cable Tray/ Wiremold Raceway		XXX
T-Stats/Mechanical Control Wiring		XXX
Ceiling Wire Fixture Supports		XXX
Duct Detectors		XXX
Power to Smoke/Fire Dampers		XXX
Hard Dig Conditions		XXX
120V AC Smoke Detectors (unless specifically included in notes above)		XXX
Utility Company Fees		XXX
Furnishing/Installing Access Panels		XXX
Distributed Antenna Systems Raceway		XXX
Raceway for beverage lines		XXX
Boring (unless noted otherwise)		XXX

Willmeng: Additional scope dollars carried for:

- •EV Charger and Trenching
- •Power to adult changing station
- •Power to Christmas Tree
- •HAWK Crossing Pothole and Locate
- •Tree Demo at HAWK Crossing
- •Chandler additional outlet
- •Lockout/Tagout inspections (Safety)
- •Mockup
- •Sub bond