PROJECT MANUAL

South Fountains Restoration

Missouri State Capitol Building

Jefferson City, Missouri

Designed By: Waters Edge Aquatic Design
1153 Southwest Blvd., Ste. 202
Kansas City, KS 66103

Date Issued: May 6, 2024

Project No.: O2204-01

STATE *of* MISSOURI

OFFICE *of* ADMINISTRATION

Facilities Management, Design and Construction

SECTION 000107 - PROFESSIONAL SEALS AND CERTIFICATIONS

PROJECT NUMBER: O2204-01

THE FOLLOWING DESIGN PROFESSIONALS HAVE SIGNED AND SEALED THE ORIGINAL PLANS AND SPECIFICATIONS FOR THIS PROJECT, WHICH ARE ON FILE WITH THE DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION:

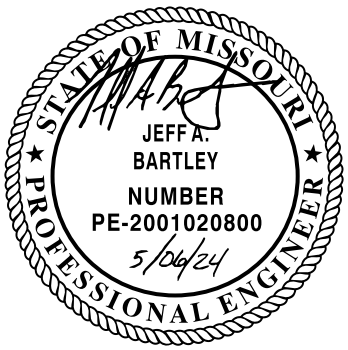
Waters Edge Aquatic Design
1153 Southwest Blvd., Ste. 202
Kansas City, KS 66103
Telephone: 913-438-4338
Email: jbartley@wedesignpools.com

List of Drawings:

G001	COVER
G002	SHEET INDEX, SITE PLAN, REHABILITATION NOTES
M101	FOUNTAIN SITE PIPING PLAN
M102	FOUNTAIN SITE DRAINAGE PLAN
M150	FOUNTAIN EQUIPMENT ROOM PLAN
M160	FOUNTAIN BASIN PLANS

List of Specifications:

011000	SUMMARY OF WORK
012600	CONTRACT MODIFICATION PROCEDURES
013100	COORDINATION
013115	PROJECT MANAGEMENT COMMUNICATIONS
013200	SCHEDULES
013300	SUBMITTALS
013513.10	SITE SECURITY AND HEALTH REQUIREMENTS
015000	CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS
017400	CLEANING
017900	DEMONSTRATION AND TRAINING
024100	DEMOLITION
033005	CAST-IN-PLACE CONCRETE
131163	MISC. METALS FOR FOUNTAINS
131185	FOUNTAIN EQUIPMENT
131187	CHEMICAL CONTROLLER
131190	FOUNTAIN PIPING, VALVES, AND RELATED ITEMS
131194	FOUNTAIN MECHANICAL IDENTIFICATION
312316.13	TRENCHING
330507	HORIZONTAL DIRECTIONAL DRILLING



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STRATA Architecture Inc.
1701 Oak Street, Suite 100
Kansas City, MO 64108
Telephone: 816-474-0900
Email: angie@strata-arch.com

List of Drawings:

A100	ARCHITECTURAL SITE PLAN
A101	BASEMENT PLAN
A150	EXISTING SOUTH FOUNTAINS PUMP ROOM ENLARGED PLAN
A151	SOUTH FOUNTAINS ENLARGED PLANS
A200	SOUTH FOUNTAINS – WEST FOUNTAIN (ARTS) – FOUNTAIN ELEVATIONS
A201	SOUTH FOUNTAINS – WEST FOUNTAIN (ARTS) – SCULPTURE ELEVATIONS
A202	SOUTH FOUNTAINS – EAST FOUNTAIN (SCIENCES) – FOUNTAIN ELEVATIONS
A203	SOUTH FOUNTAIONS – EAST FOUNTAIN (SCIENCES) SCULPTURE ELEVATIONS

List of Specifications:

001115.01	PREQUALIFICATION OF MASONRY CONTRACTORS
001115.02	PREQUALIFICATION OF ABRASIVE CLEANING CONTRACTORS
013233	PHOTOGRAPHIC DOCUMENTATION
013591	HISTORIC TREATMETN PROCEDURES
024296	HISTORIC REMOVAL AND DISMANTLING
040110	MASONRY CLEANING AND TREATMENT
041111	MASONRY AND CONCRETE ABRASIVE CLEANING
040120	MASONRY REHABILITATION
071613	POLYMER MODIFICED CEMENT WATERPROOFING
079200	JOINT SEALANTS

Angie Gaebler
5/6/2024

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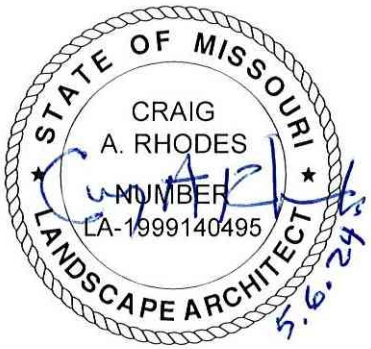
Vireo
414 Oak Street, Suite 101
Kansas City, MO 64106
Telephone: 816-756-5690
Email: mike@bevireo.com

List of Drawings:

L001	OVERALL LANDSCAPE PLAN
L002	FOUNTAIN LANDSCAPE ENLARGEMENTS
L003	LANDSCAPE DETAILS
IR001	OVERALL IRRIGATION PLAN
IR002	IRRIGATION PLAN ENLARGEMENTS
IR003	IRRIGATION DETAILS

List of Specifications:

328400	PLANTING IRRIGATION
329113	SOIL PREPARATION
393000	PLANTS



CRAIG A. RHODES
MISSOURI L.A. NO. 1999140495

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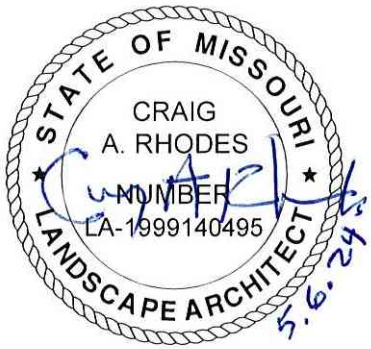
VIREO
414 Oak, Suite 101
Kansas City, MO 64106
Telephone: 816-756-5690
Email: craig@bevireo.com

List of Drawings:

L001	OVERALL LANDSCAPE PLAN
L002	FOUNTAIN LANDSCAPE ENLARGEMENTS
L003	LANDSCAPE DETAILS
IR001	OVERALL IRRIGATION PLAN
IR002	IRRIGATION PLAN ENLARGEMENTS
IR003	IRRIGATION DETAILS

List of Specifications:

328400	Planting Irrigation
329113	Soil Preparation
393000	Plants



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Hoss & Brown Engineers
15902 Midland Dr
Shawnee, KS 66217
Telephone: 913-362-9090
Email: jpuckett@h-be.com

List of Drawings:

E001	ELECTRICAL SYMBOLS AND GENERAL NOTES
E002	ELECTRICAL SPECIFICATIONS
E101	FOUNTAIN SITE ELECTRICAL PLAN
E151	FOUNTAIN EQUIPMENT ROOM PLAN – ELECTRICAL
E601	ELECTRICAL SCHEDULES & DETAILS

List of Specifications:

260000	Electrical Specifications

05/06/2024

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fSECTION 000115 – LIST OF DRAWINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract including General and Supplementary Conditions, Bid Form, and other Division 1 Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section provides a comprehensive list of the drawings that comprise the Bid Documents for this project.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 LIST OF DRAWINGS

A. The following list of drawings is a part of the Bid Documents:Adjust list below to suit Project.

	TITLE	SHEET #	DATE	CAD #
1.	Cover Sheet	Sheet G001	05/06/24	O2204-01G001
2.	Sheet Index, Site Plans, Rehabilitation Notes	Sheet G002	05/06/24	O2204-01_G002
3.	Overall Landscape Plan	Sheet L001	05/06/24	O2204-01_L001
4.	Fountain Landscape Enlargements	Sheet L002	05/06/24	O2204-01_L002
5.	Landscape Details	Sheet L003	05/06/24	O2204-01_L003
6.	Overall Irrigation Plan	Sheet IR001	05/06/24	O2204-01_IR001
7.	Irrigation Plan Enlargements	Sheet IR002	05/06/24	O2204-01_IR002
8.	Irrigation Details	Sheet IR003	05/06/24	O2204-01_IR003
9.	Architectural Site Plan	Sheet A-100	05/06/24	O2204-01_A-FP-00
10.	Basement Plan	Sheet A-101	05/06/24	O2204-01_A-FP-00
11.	South Fountains Pump Room Enlarged Plan	Sheet A-150	05/06/24	O2204-01_A-FP-Pump Room
12.	South Fountains Enlarged Plans	Sheet A-151		O2204-01_A-FP-East Science
13.	South Fountains – West Fountain (Arts) – Fountain Elevations	Sheet A-200		O2204-01_A-FP-West Art

14. South Fountains – West Fountain (Arts) – Sculpture Elevations
    Sheet A-201 O2204-01_A-FP-West Art
15. South Fountains – East Fountain (Sciences) – Fountain Elevations
    Sheet A-202 O2204-01_A-FP-East Science
16. South Fountains – East Fountain (Sciences) – Sculpture Elevations
    Sheet A-203 O2204-01_A-FP-East Science
17. Fountain Site Piping Plan Sheet M101 O2204-01_M101-M102
18. Fountain Site Drainage Plan Sheet M102 O2204-01_M101-M102
19. Fountain Equipment Room Plan Sheet M150 O2204-01_M150
20. Fountain Basin Plans Sheet M160 O2204-01_M160
21. Electrical Symbols and General Notes
    Sheet E001 O2204-01_E001
22. Electrical Specifications Sheet E002 O2204-01_E002
23. Fountain Site Electrical Plan Sheet E101 O2204-01_E101
24. Fountain Equipment Room Plan - Electrical
    Sheet E151 O2204-01_E151
25. Electrical Schedules & Details Sheet E601 O2204-01_E601

END OF SECTION 000115

SECTION 001116 - INVITATION FOR BID

1.0 OWNER:

A. The State of Missouri
Office of Administration,
Division of Facilities Management, Design and Construction
Jefferson City, Missouri

2.0 PROJECT TITLE AND NUMBER:

A. South Fountains Restoration
Missouri State Capitol Building
Jefferson City, Missouri
Project No.: O2204-01

3.0 BIDS WILL BE RECEIVED:

A. Until: 1:30 PM, June 10, 2025

****PRE-QUALIFICATION OF HISTORIC MASONRY RESTORATION SPECIALIST AND HISTORIC MASONRY ABRASIVE CLEANING SPECIALIST REQUIRED**** Any bids received that do not include a pre-qualified Historic Masonry Restoration Specialist and a pre-qualified Historic Masonry Abrasive Cleaning Specialist shall be rejected. See Request for Pre-Qualification Package for information regarding submitting statements of qualifications along with instructions on where and what time submissions are due to the Owner.

B. **Only electronic bids sent to FMDCBids@oa.mo.gov shall be accepted: (See Instructions to Bidders for further detail)**

4.0 DESCRIPTION:

A. Scope: The project includes the complete restoration of the two historic fountains on the south lawn of the Capitol Building - The Fountain of the Arts and The Fountain of the Sciences. Clean, repair, replace and repoint all stonework including the water feature statuary, and basin; test all piping in the fountain statuary as well as the pipes from the Capitol Building and repair or replace as needed. Install new pumps, valves, gaskets, sealants and filters including repairing and replacing any necessary electrical and lighting systems with LED upgrades to fully refurbish the fountain systems. Explore the use of UV sanitation system as an alternate to chlorine which may reduce future damage. Include re-establishment of the landscaping adjacent to the fountains and install an irrigation system that can be incorporated into the Capitol Complex's standard operations.

B. MBE/WBE/SDVE Goals: MBE 0%, WBE 0%, and SDVE 3%. **NOTE: Only MBE/WBE firms certified by the State of Missouri Office of Equal Opportunity as of the date of bid opening, or SDVE(s) meeting the requirements of Section 34.074, RSMo and 1 CSR 30-5.010, can be used to satisfy the MBE/WBE/SDVE participation goals for this project.**

5.0 PRE-BID / PRE-QUALIFICATION MANDATORY SITE WALK-THRU MEETING:

A. Place/Time**:** Time 1:00 PM, May 6, 2025, Harry S Truman State Office Building, 301 West High, Jefferson City, MO, Conf Rm 750A

****THIS IS A MANDATORY WALK-THRU FOR THE PRE-QUALIFICATION AND PRE-BID****

B. Access to State of Missouri property requires presentation of a photo ID by all persons

6.0 PRE-QUALIFICATION:

****PRE-QUALIFICATION OF HISTORIC MASONRY RESTORATION SPECIALIST AND HISTORIC MASONRY ABRASIVE CLEANING SPECIALIST REQUIRED**** Any bids received that do not include a pre-qualified Historic Masonry Restoration Specialist shall be rejected.

See Request for Pre-Qualification Package for information regarding submitting statements of qualifications. An addendum will be issued to this bid package with company names and contact information of selected pre-qualified Historic Masonry Restoration Specialists *and* pre-qualified Historic Masonry Abrasive Cleaning Specialists.

7.0 HOW TO GET PLANS & SPECIFICATIONS:

A. View Only Electronic bid sets are available at no cost or paper bid sets for a deposit of $100.00 from American Document Solutions (ADS). MAKE CHECKS PAYABLE TO: American Document Solutions. Mail to: American Document Solutions, 1400 Forum Blvd., Suite 7A, Columbia, Missouri 65203. Phone 573-446-7768, Fax 573-355-5433, https://www.adsplanroom.net. NOTE: Prime contractors will be allowed a maximum of two bid sets at the deposit rate shown above. Other requesters will be allowed only one bid set at this rate. Additional bid sets or parts thereof may be obtained by any bidder at the cost of printing and shipping by request to American Document Solutions at the address shown above. Bidder must secure at least one bid set to become a planholder.

B. **Refunds: Return plans and specifications in unmarked condition within 15 working days of bid opening to American Document Solutions, 1400 Forum Blvd., Suite 7A, Columbia, Missouri 65203. Phone 573-446-7768, Fax 573-355-5433. Deposits for plans not returned within 15 working days shall be forfeited.**

C. Information for upcoming bids, including downloadable plans, specifications, Invitation for Bid, bid tabulation, award, addenda, and access to the ADS planholders list, is available on the Division of Facilities Management, Design and Construction's web site: https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans.

8.0 POINT OF CONTACT:

A. Designer: Waters Edge Aquatic Design, Jeff Bartley, (913) 438-4338, email: jbartley@wedesignpools.com

B. Project Manager: Andrew Friedmeyer, (573) 536-8019, email: andrew.friedmeyer@oa.mo.gov

9.0 GENERAL INFORMATION:

A. The State reserves the right to reject any and all bids and to waive all informalities in bids. No bid may be withdrawn for a period of 20 working days subsequent to the specified bid opening time. The contractor shall pay not less than the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed, as determined by the Missouri Department of Labor and Industrial Relations and as set out in the detailed plans and specifications.

B. Bid results will be available at https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans after it is verified that at least one bid is awardable and affordable.

SECTION 002113 – INSTRUCTIONS TO BIDDERS

1.0 - SPECIAL NOTICE TO BIDDERS

A. If awarded a contract, the Bidder's employees, and the employees of all subcontractors, who perform the work on the project must adhere to requirements in Section 013513 – Site Security and Health Requirements as applicable per Agency.

B. The Bidder's prices shall include all city, state, and federal sales, excise, and similar taxes that may lawfully be assessed in connection with the performance of work, and the purchased of materials to be incorporated in the work. **THIS PROJECT IS NOT TAX EXEMPT.**

2.0 - BID DOCUMENTS

A. The number of sets obtainable by one (1) party may be limited in accordance with available supply.

B. For the convenience of contractors, subcontractors and suppliers, bidding documents are available on the Owner's website at https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans.

3.0 - BIDDERS' OBLIGATIONS

A. Bidders must carefully examine the entire site of the work and shall make all reasonable and necessary investigations to inform themselves thoroughly as to the facilities available as well as to all the difficulties involved in the completion of all work in accordance with the specifications and the plans. Bidders are required to examine all maps, plans and data mentioned in the specifications. No plea of ignorance concerning observable existing conditions or difficulties that may be encountered in the execution of the work under this contract will be accepted as an excuse for any failure or omission on the part of the successful Bidder (contractor) to fulfill every detail of the requirements of the contract, nor accepted as a basis for any claims for extra compensation or time extension.

B. Under no circumstances will Bidders give their plans and specifications to other Bidders. It is highly encouraged, but not required, that all Bidders be on the official planholders list to receive project updates including but not limited to any addenda that are issued during the bidding process.

4.0 - INTERPRETATIONS

A. No Bidder shall be entitled to rely on oral or written representations from any person as to the meaning of the plans and specifications or the acceptability of alternate products, materials, form or type of construction.

B. Bidders shall make all requests for interpretations in writing and submit all requests to the Project Designer and Project Manager identified in Section 007300 – Supplementary Conditions with all necessary supporting documentation no less than five (5) working days before opening of bids. Responses to requests for interpretation will be issued via a written addendum and will be sent as promptly as is practicable to all official planholders and posted on the Owner's website. All such addenda shall become part of the bid and contract documents.

C. Bidders shall make all requests for an "Acceptable Substitution" on the Section 006325 Substitution Request Form. The request shall be emailed to the Project Designer and Project Manager identified in Section 007300 – Supplementary Conditions no less than five (5) working days before opening of bids. Responses to requests for substitutions will be issued via a written addendum and will be sent as promptly as is practicable to all official planholders and posted on the Owner's website. All such addenda shall become part of the bid and contract documents.

D. An "Acceptable Substitution" requested after the award of bid will only be approved if proven to the satisfaction of the Owner and the Designer that the product is acceptable in design, strength, durability, usefulness, and convenience for the purpose intended. Approval of the substitution after award is at the sole discretion of the Owner and all requests of this nature must be submitted in accordance with Article 3.1 of the General Conditions.

5.0 - BIDS AND BIDDING PROCEDURE

A. Bidders shall submit all submission forms and accompanying documents listed in Section 004113 – Bid Form, Article 5.0, Attachments to Bid by the stated time on the bid documents or the bid will be rejected for being non-responsive.

B. Depending on the specific project requirements, **the following is a GENERIC list** of all possible bid forms that may be due with bid submittals. Bidders must verify each specific project's requirements in Section 004113 to ensure they have provided all the required documentation with their submission.

Bid Submittal – due before stated date and time of bid opening (see IFB):

004113	Bid Form (all pages are always required)
004322	Unit Prices Form
004336	Proposed Subcontractors Form
004337	MBE/WBE/SDVE Compliance Evaluation Form
004338	MBE/WBE/SDVE Eligibility Determination for Joint Ventures
004339	MBE/WBE/SDVE GFE Determination
004340	SDVE Business Form
004541	Affidavit of Work Authorization
004545	Anti-Discrimination Against Israel Act Certification form

C. The Bidder shall submit its bid on the forms provided by the Owner in the same file format (PDF) with each space fully and properly completed, typewritten or legibly printed, including all amounts required for alternate bids, unit prices, cost accounting data, etc. The Owner will reject bids that are not on the Owner's forms or that do not contain all requested information. All forms can be found on the Owner's website at https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans and shall be submitted with your bid to FMDCBids@oa.mo.gov.

D. All bids shall be submitted without additional terms and conditions, modifications, or reservations. The completed forms should not include interlineations, alterations, or erasures. Bids not in compliance with the requirements of this paragraph will be rejected as non-responsive.

E. All bids shall be accompanied by a bid bond executed by the bidder and a duly authorized surety company, certified check, cashier's check or bank draft made payable to the Division of Facilities Management, Design and Construction, State of Missouri, in the amount indicated in the bid documents in Section 004113. Failure of the Bidder to submit the duly authorized bid bond or the full amount required shall be sufficient cause to reject his bid. The Bidder agrees that the proceeds of the check, draft, or bond shall become the property of the State of Missouri, if for any reason the Bidder withdraws his bid after bid closing or if the Bidder, within ten (10) working days after notification of award, refuses or is unable to 1) execute the tendered contract, 2) provide an acceptable performance and payment bond, or 3) provide evidence of required insurance coverage.

F. The bid bond check or draft submitted by the successful Bidder will be returned after the receipt of an acceptable performance and payment bond and execution of the formal contract. Checks or drafts of all other Bidders will be returned within a reasonable time after it is determined that the bid represented by same will receive no further consideration by the State of Missouri.

6.0 - SIGNING OF BIDS

A. A bid should contain the full and correct legal name of the Bidder. If the Bidder is an entity registered with the Missouri Secretary of State, the Bidder's name on the bid form should appear as shown in the Secretary of State's records. If the Bidder is an entity organized in a state other than Missouri, the Bidder must provide a Certificate of Authority to do business in the State of Missouri.

B. If the successful Bidder is doing business in the State of Missouri under a fictitious name, the Bidder shall furnish to Owner, attached to the Bid Form, a properly certified copy of the certificate of Registration of Fictitious Name from the State of Missouri, and such certificate shall remain on file with the Owner.

C. A bid from an individual shall be signed as noted on the Bid Form.

D. A bid from a partnership or joint venture shall require only one signature of a partner, an officer of the joint venture authorized to bind the venture, or an attorney-in-fact. If the bid is signed by an officer of

a joint venture or an attorney-in-fact, a document evidencing the individual's authority to execute contracts should be included with the bid form.

E. A bid from a limited liability company (LLC) shall be signed by a manager or a managing member of the LLC.

F. A bid from a corporation shall have the correct corporate name thereon and the signature of an authorized officer of the corporation. Title of office held by the person signing for the corporation shall appear, along with typed name of said individual and the corporate license number shall be provided. In addition, for corporate proposals, the President or Vice-President listed per the current filing with the Missouri Secretary of State should sign as the Bidder. If the signatory is other than the corporate president or vice president, the bidder must provide satisfactory evidence that the signatory has the legal authority to bind the corporation.

7.0 - RECEIVING BID SUBMITTALS

A. It is the Bidder's sole responsibility to ensure receipt of the bid submittals by Owner on or before the date and time specified in the Invitation for Bid or as modified via written addenda. Bids received after the date and time specified will not be considered by the Owner.

B. All bids shall be received via email at FMDCBids@oa.mo.gov and bids received by the Owner through any other means, including hard copies, will not be considered, and will be discarded by the Owner unopened.

8.0 - MODIFICATION AND WITHDRAWAL OF BIDS

A. Bidder may withdraw a bid at any time prior to the scheduled closing time for receipt of bids, but no bidder may withdraw his bid for a period of twenty (20) working days after the scheduled closing time for receipt of bids.

B. Bidder may modify a bid until the scheduled closing time by sending a revised bid to FMDCBids@oa.mo.gov with a note in the subject line and body of the email that it is a revised bid. All revised bids must be submitted to FMDCBids@oa.mo.gov, revised bids sent any other way will not be considered.

9.0 - AWARD OF CONTRACT

A. The Owner reserves the right to reject any and/or all bids and further to waive all informalities in bidding when deemed in the best interest of the State of Missouri.

B. The Owner reserves the right to let other contracts in connection with the work including, but not limited to, contracts for the furnishing and installation of furniture, equipment, machinery, appliances and other apparatuses.

C. The Owner will award a contract to the lowest, responsive, and responsible Bidder in accordance with Section 8.250, RSMo. No contract will be awarded to any Bidder who has had a contract with the Owner terminated within the preceding twelve months for material breach of contract or who has been suspended or debarred by the Owner.

D. Award of alternates, if any, will be made in numerical order unless all bids received are such that the order of acceptance of alternates does not affect the determination of the lowest, responsive, responsible bidder.

E. No award shall be considered binding upon the Owner until the written contract has been properly executed and the following documentation has been provided: 1) performance and payment bond consistent with Article 6.1 of the General Conditions; 2) proof of the required insurance coverage; 3) an executed Section 004541 - Affidavit of Work Authorization form; and 4) documentation evidence enrollment and participation in a federal work authorization program.

F. Failure to execute and return the contract and associated documents within the prescribed period shall be treated, at the option of the Owner, as a breach of Bidder's obligation and the Owner shall be under no further obligation to Bidder.

G. Transient employers subject to Sections 285.230 and 285.234, RSMo, (out-of-state employers who temporarily transact any business in the State of Missouri) may be required to file a bond with the

Missouri Department of Revenue. No contract will be awarded by the Owner unless the successful Bidder certifies that he has complied with all applicable provisions of Section 285.230-234.

H. Sections 285.525 and 285.530, RSMo, require business entities to enroll and participate in a federal work authorization program in order to be eligible to receive award of any state contract in excess of $5,000. Bidders should submit with their bid an Affidavit of Work Authorization (Section 004541) along with appropriate documentation evidencing such enrollment and participation. Bidders must also submit an E-Verify Memorandum before the Owner may award a contract to the Bidder. Information regarding a E-Verify is located at https://www.uscis.gov/e-verify/. The contractor shall be responsible for ensuring that all subcontractors and suppliers associated with this contract enroll in E-Verify.

I. The successful Bidder must be registered in MissouriBUYS powered by MOVERS at https://missouribuys.mo.gov/supplier-registration# as an approved vendor prior to being issued a contract.

10.0 - CONTRACT SECURITY

A. The successful Bidder shall furnish a performance/payment bond as set forth in General Conditions Article 6.1 prior to the State executing the contract and issuing a notice to proceed.

11.0 - LIST OF SUBCONTRACTORS

A. If required by "Section 004113 – Bid Form," each Bidder must submit as part of their bid a list of subcontractors to be used in performing the work (Section 004336). The list must specify the name of the single designated subcontractor, manufacturer, or suppliers for each category of work listed in "Section 004336 - Proposed Subcontractors Form." If work within a category will be performed by more than one subcontractor, the bidder must provide the name of each subcontractor and specify the exact portion of the work to be done by each. If the Bidder intends to perform any of the designated subcontract work with the use of his own employees, the Bidder shall make that fact clear, by listing his own firm for the subject category. **If any category of work is left vacant or if more than one subcontractor is listed for any category without designating the portion of work to be performed by each, the bid shall be rejected.**

12.0 - WORKING DAYS

A. Contract duration time is stated in working days and will use the following definition in determining the actual calendar date for contract completion:

1. Working days are defined as all calendar days except Saturdays, Sundays and the following State of Missouri observed holidays: New Year's Day, Martin Luther King, Jr. Day, Lincoln Day, Washington's Birthday, Truman Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day and Christmas Day.

13.0 - AMERICAN AND MISSOURI - MADE PRODUCTS AND FIRMS

A. By signing the bid form and submitting a bid on this project, the Bidder certifies that it will use American and Missouri products as set forth in Article 1.7 of the General Conditions. Bidders are advised to review those requirements carefully prior to bidding.

B. A preference shall be given to Missouri firms, corporations or individuals, or firms, corporations or individuals that maintain Missouri offices or places of business, when the quality of performance promised is equal or better and the price quoted is the same or less.

C. Pursuant to Section 34.076, RSMo, a contractor or Bidder domiciled outside the boundaries of the State of Missouri shall be required, in order to be successful, to submit a bid the same percent less than the lowest bid submitted by a responsible contractor or Bidder domiciled in Missouri as would be required for such a Missouri domiciled contractor or Bidder to succeed over the bidding contractor or Bidder domiciled outside Missouri on a like contract or bid being let in the Bidder's domiciliary state and, further, the contractor or Bidder domiciled outside the boundaries of Missouri shall be required to submit an audited financial statement as would be required of a Missouri domiciled contractor or Bidder on a like contract or bid being let in the domiciliary state of that contractor or Bidder.

14.0 – ANTI-DISCRIMINATION AGAINST ISRAEL ACT CERTIFICATION:

A. If the Bidder meets the section 34.600, RSMo., definition of a "company" and the Bidder has ten or more employees, the Bidder must certify in writing that the Bidder is not currently engaged in a boycott of goods or services from the State of Israel and shall not engage in a boycott of goods or services from the State of Israel, if awarded a contract, for the duration of the contract. The Bidder is required to complete and submit the applicable portion of Section 004545 - Anti-Discrimination Against Israel Act Certification with its Bid Form. The applicable portion of the exhibit must be submitted prior to execution of a contract by the Owner and issuance of Notice to Proceed.

15.0 - MBE/WBE/SDVE INSTRUCTIONS

A. Definitions:

1. **"MBE"** means a Minority Business Enterprise.

2. **"MINORITY"** has the same meaning as set forth in 1 C.S.R. 10-17.010.

3. **"MINORITY BUSINESS ENTERPRISE"** has the same meaning as set forth in section 37.020, RSMo.

4. **"WBE"** means a Women's Business Enterprise.

5. **"WOMEN'S BUSINESS ENTERPRISE"** has the same meaning as set forth in section 37.020, RSMo.

6. **"SDVE"** means a Service-Disabled Veterans Enterprise.

7. **"SERVICE-DISABLED VETERAN"** has the same meaning as set forth in section 34.074, RSMo.

8. **"SERVICE-DISABLED VETERAN ENTERPRISE"** has the same meaning as "Service-Disabled Veteran Business" set forth in section 34.074, RSMo.

B. MBE/WBE/SDVE General Requirements:

1. For all bids greater than $100,000, the Bidder shall obtain MBE, WBE and SDVE participation in an amount equal to or greater than the percentage goals set forth in the Invitation for Bid and the Bid Form, unless the Bidder is granted a Good Faith Effort waiver by the Director of the Division, as set forth below. If the Bidder does not meet the MBE, WBE and SDVE goals, or make a good faith effort to do so, the Bidder shall be nonresponsive, and its bid shall be rejected.

2. The Bidder should submit with its bid all the information requested in the MBE/WBE/SDVE Compliance Evaluation Form for every MBE, WBE, or SDVE subcontractor or material supplier the Bidder intends to use for the contract work. The Bidder is required to submit all MBE/WBE/SDVE documentation before the stated time and date set forth in the Invitation for Bid. If the Bidder fails to provide such information by the specified date and time, the Owner shall reject the bid.

3. The Director reserves the right to request additional information from a Bidder to clarify the Bidder's proposed MBE, WBE, and/or SDVE participation. The Bidder shall submit the clarifying information requested by the Owner within two (2) working days of receiving the request for clarification.

4. Pursuant to section 34.074, RSMo, a Prime Bidder that qualifies as an SDVE shall receive a three-percentage point bonus preference in the contract award evaluation process. The bonus preference will be calculated and applied by reducing the bid amount of the eligible SDVE by three percent of the apparent low responsive Bidder's bid. Based on this calculation, if the eligible SDVE's evaluation is less than the apparent low responsive Bidder's bid, the eligible SDVE's bid will become the apparent low responsive bid. This reduction is for evaluation purposes only and will have no impact on the actual amount(s) of the bid or the amount(s) of any contract awarded. In order to be eligible for the SDVE preference, the Bidder must complete and submit with its bid the Missouri Service-Disabled Veteran Business Form, and any information required by the form.

C. Computation of MBE/WBE/SDVE Goal Participation:

1. A Bidder who is a MBE, WBE, or SDVE may count 100% of the contract towards the MBE, WBE or SDVE goal, less any amounts awarded to another MBE, WBE or SDVE. (NOTE: a MBE firm that bids as general contractor must obtain WBE and SDVE participation; a WBE firm that bids as a general contractor must obtain MBE and SDVE participation; and a SDVE firm that bids as general

contractor must obtain MBE and WBE participation.) For the remaining contract amount to be counted towards the MBE, WBE or SDVE goal, the Bidder must complete the MBE/WBE/SDVE Compliance Evaluation Form (Section 004337) identifying itself as an MBE, WBE or SDVE.

2. The total dollar value of the work granted to a certified MBE, WBE or SDVE by the Bidder shall be counted towards the applicable goal.

3. Expenditures for materials and supplies obtained from a certified MBE, WBE, or SDVE supplier or manufacturer may be counted towards the MBE, WBE and SDVE goals, if the MBE, WBE, or SDVE assumes the actual and contractual responsibility for the provision of the materials and supplies.

4. The total dollar value of the work granted to a second or subsequent tier subcontractor or a supplier may be counted towards a Bidder's MBE, WBE and SDVE goals, if the MBE, WBE, or SDVE properly assumes the actual and contractual responsibility for the work.

5. The total dollar value of work granted to a certified joint venture equal to the percentage of the ownership and control of the MBE, WBE, or SDVE partner in the joint venture may be counted towards the MBE/WBE/SDVE goals.

6. Only expenditures to a MBE, WBE, or SDVE that performs a commercially useful function in the work may be counted towards the MBE, WBE and SDVE goals. A MBE, WBE, or SDVE performs a commercially useful function when it is responsible for executing a distinct element of the work and carrying out its responsibilities by performing, managing and supervising the work or providing supplies or manufactured materials.

D. Certification of MBE/WBE/SDVE Subcontractors:

1. In order to be counted towards the goals, an MBE or WBE must be certified by the State of Missouri Office of Equal Opportunity and an SDVE must be certified by the State of Missouri, Office of Equal Opportunity or by the Federal U.S. Small Business Administration directory.

2. The Bidder may determine the certification status of a proposed MBE or WBE subcontractor or supplier by referring to the Office of Equal Opportunity (OEO)'s online MBE/WBE directory https://apps1.mo.gov/MWBCertifiedFirms/. The Bidder may determine the eligibility of a SDVE subcontractor or supplier by referring to the Office of Equal Opportunity online SDVE directory at https://oeo.mo.gov/sdve-certification-program/ or the Federal U.S. Small Business Administration directory https://veterans.certify.sba.gov/#search.

3. Additional information, clarifications, or other information regarding the MBE/WBE/SDVE listings in the directories may be obtained by contacting the Contract Specialist of record as shown in the Supplementary Conditions (Section 007300).

E. Waiver of MBE/WBE/SDVE Participation:

1. If a Bidder has made a good faith effort to secure the required MBE, WBE and/or SDVE participation and has failed, the Bidder shall submit with its bid the information requested in MBE/WBE/SDVE Good Faith Effort (GFE) Determination form. The Director will determine if the Bidder made a good faith effort to meet the applicable goals. If the Director determines that the Bidder did not make a good faith effort, the bid shall be rejected as being nonresponsive to the bid requirements. Bidders who demonstrate that they have made a good faith effort to include MBE, WBE, and/or SDVE participation will be granted a waiver and will be considered to be responsive to the applicable participation goals, regardless of the percent of actual participation obtained, if the bid is otherwise acceptable.

2. In determining whether a Bidder has made a good faith effort to obtain MBE, WBE and/or SDVE participation, the Director may evaluate the factors set forth in 1 CSR 30-5.010(6)(C) and the following:

   a. The amount of actual participation obtained;

b. How and when the Bidder contacted potential MBE, WBE, and SDVE subcontractors and suppliers;

c. The documentation provided by the Bidder to support its contacts, including whether the Bidder provided the names, addresses, phone numbers, and dates of contact for MBE/WBE/SDVE firms contacted for specific categories of work;

d. If project information, including plans and specifications, were provided to MBE/WBE/SDVE subcontractors;

e. Whether the Bidder made any attempts to follow-up with MBE, WBE or SDVE firms prior to bid;

f. Amount of bids received from any of the subcontractors and/or suppliers that the Bidder contacted;

g. The Bidder's stated reasons for rejecting any bids;

F. Contractor MBE/WBE/SDVE Obligations

1. If awarded a contract, the Bidder will be contractually required to subcontract with or obtain materials from the MBE, WBE, and SDVE firms listed in its bid, in amounts equal to or greater than the dollar amount in the bid, unless the amount is modified in writing by the Owner.

2. If the Contractor fails to meet or maintain the participation requirements contained in the Contractor's bid, the Contractor must satisfactorily explain to the Director why it cannot comply with the requirement and why failing meeting the requirement was beyond the Contractor's control. If the Director finds the Contractor's explanation unsatisfactory, the Director may take any appropriate action including, but not limited to:

   a. Declaring the Contractor ineligible to participate in any contracts with the Division for up to twelve (12) months (suspension); and/or

   b. Declaring the Contractor be nonresponsive to the Invitation for Bid, or in breach of contract and rejecting the bid or terminating the contract.

3. If the Contractor replaces an MBE, WBE, or SDVE during the course of the contract, the Contractor shall replace it with another MBE, WBE, or SDVE or make a good faith effort to do so. All MBE, WBE and SDVE substitutions must be approved by the Director in writing.

4. The Contractor shall provide the Owner with regular reports on its progress in meeting its MBE/WBE/SDVE obligations. At a minimum, the Contractor shall report the dollar-value of work completed by each MBE, WBE, or SDVE during the preceding month and the cumulative total of work completed by each MBE, WBE or SDVE to date with each monthly application for payment. The Contractor shall also make a final report, which shall include the total dollar-value of work completed by each MBE, WBE, and SDVE during the entire contract.

State of Missouri
Construction Contract

THIS AGREEMENT is made (DATE) by and between:

Contractor Name and Address

hereinafter called the "Contractor," and the **State of Missouri**, hereinafter called the **"Owner"**, represented by the Office of Administration, Division of Facilities Management, Design and Construction.

WITNESSETH, that the Contractor and the Owner, for the consideration stated herein agree as follows:

ARTICLE 1. STATEMENT OF WORK

The Contractor shall furnish all labor and materials and perform all work required for furnishing and installing all labor, materials, equipment and transportation and everything necessarily inferred from the general nature and tendency of the plans and specifications for the proper execution of the work for:

Project Name: **South Fountains Restoration**
Missouri State Capitol Building
Jefferson City, Missouri

Project Number: **O2204-01**

in strict accordance with the Contract Documents as enumerated in Article 7, all of which are made a part hereof.

ARTICLE 2. TIME OF COMPLETION

The contract completion date is **April 3, 2026**. This time includes ten (10) working days for the Contractor to receive, sign and return the contract form along with required bonding and insurance certificates. Failure of the Contractor to provide correct bonding and insurance within the ten (10) working days shall not be grounds for a time extension. Receipt of proper bonding and insurance is a condition precedent to the formation of the contract and if not timely received, may result in forfeiture of the Contractor's bid security. Work may not commence until the Owner issues a written Notice to Proceed and must commence within seven (7) working days thereafter.

ARTICLE 3. LIQUIDATED DAMAGES

Whenever time is mentioned in this contract, time shall be and is of the essence of this contract. The Owner would suffer a loss should the Contractor fail to have the work embraced in this contract fully completed on or before the time above specified. THEREFORE, the parties hereto realize in order to adjust satisfactorily the damages on account of such failure that it might be impossible to compute accurately or estimate the amount of such loss or damages which the Owner would sustain by reason of failure to complete fully said work within the time required by this contract. The Contractor hereby covenants and agrees to pay the Owner, as and for **liquidated damages, the sum of $1,000** per day for each and every day, Sunday and legal holidays excepted, during which the work remains incomplete and unfinished. Any sum which may be due the Owner for such damages shall be deducted and retained by the Owner from any balance which may be due the Contractor when said work shall have been finished and accepted. But such provisions shall not release the Bond of the Contractor from liability according to its terms. In case of failure to complete, the Owner will be under no obligation to show or prove any actual or specific loss or damage.

ARTICLE 4. CONTRACT SUM

The Owner shall pay the Contractor for the prompt, faithful and efficient performance of the conditions and undertakings of this contract, subject to additions, and deductions as provided herein, in current funds the sum of:

Base Bid: $

Alternate No. 1: $

Accepted Alternates, if applicable to the Project and accepted by the Owner.

TOTAL CONTRACT AMOUNT: ($CONTRACT AMOUNT)

ARTICLE 5. PREVAILING WAGE RATE

MISSOURI PREVAILING WAGE LAW (Sections 290.210 to 290.340, RSMo): The Contractor shall pay not less than the specified hourly rate of wages, as set out in the wage order attached to and made part of the specifications for work under this contract, to all workers performing work under the contract, in accordance with sections 290.210 to 290.340, RSMo. The Contractor shall forfeit a penalty to the Owner of one hundred dollars per day (or portion of a day) for each worker that is paid less than the specified rates for any work done under the contract by the Contractor or by any subcontractor, in accordance with section 290.250, RSMo.

DAVIS-BACON ACT: If this Project is financed in whole or in part from Federal funds (as indicated in the Instructions to Bidders or other bid or contract documents for this Project), then this contract shall be subject to all applicable federal labor statutes, rules and regulations, including provisions of the Davis-Bacon Act, 40 U.S.C. §3141 et seq., and the "Federal Labor Standards Provisions," as further set forth in Section 007333 – Supplementary General Conditions for Federally Funded/Assisted Construction Projects, which is incorporated into the contract by reference. Where the Missouri Prevailing Wage Law and the Davis-Bacon Act require payment of different wages for work performed under this contract, the Contractor and all Subcontractors shall pay the greater of the wages required under either law, on a classification-by-classification basis.

ARTICLE 6. MINORITY/WOMEN/SERVICE DISABLED VETERAN BUSINESS ENTERPRISE PARTICIPATION

The Contractor has been granted a waiver of the 0% MBE and 0% WBE and 3% SDVE participation goals. The Contractor agrees to secure the MBE/WBE/SDVE participation amounts for this project as follows: (OR)

The Contractor has met the MBE/WBE/SDVE participation goals and agrees to secure the MBE/WBE/SDVE participation amounts for this project as follows:

MBE/WBE/SDVE Firm: Subcontract Amt:$
MBE/WBE/SDVE Firm: Subcontract Amt:$
MBE/WBE/SDVE Firm: Subcontract Amt:$

Total $

MBE/WBE/SDVE assignments identified above shall not be changed without a contract change signed by the Owner.

The Director of the Division of Facilities Management, Design and Construction or his Designee shall be the final authority to resolve disputes and disagreements between the Contractor and the MBE/WBE/SDVE firms listed above when such disputes impact the subcontract amounts shown above.

ARTICLE 7. CONTRACT DOCUMENTS

The following documents are hereby incorporated into this contract by reference (all division/section numbers and titles are as utilized in the Project Manual published by the Owner for this Project):

1. Division 0 – Procurement and Contracting Information, including, but not limited to:
    a. Invitation for Bid (Section 001116)
    b. Instructions to Bidders (Section 002113)
    c. Supplementary Instructions to Bidders (if applicable) (Section 002213)
    d. The following documents as completed and executed by the Contractor and accepted by the Owner, if applicable:

i. Bid Form (Section 004113)
ii. Unit Prices (Section 004322)
iii. Proposed Contractors Form (Section 004336)
iv. MBE, WBE, SDVE Compliance Evaluation Form(s) (Section 004337)
v. MBE, WBE, SDVE Eligibility Determination Form for Joint Ventures (Section 004338)
vi. MBE, WBE, SDVE Good Faith Effort (GFE) Determination Form (Section 004339)
vii. Missouri Service Disabled Veteran Business Form (Section 004340)
viii. Affidavit of Work Authorization (Section 004541)
ix. Affidavit for Affirmative Action (Section 005414), if applicable

e. Performance and Payment Bond, completed and executed by the Contractor and surety (Section 006113)
f. General Conditions (Section 007213)
g. Supplementary Conditions (Section 007300)
h. Supplementary General Conditions for Federally Funded/Assisted Construction Projects (Section 007333), if applicable
i. Wage Rate(s) (Section 007346)

2. Division 1 – General Requirements
3. All Drawings identified in the Project Manual
4. All Technical Specifications included in the Project Manual
5. Addenda, if applicable

ARTICLE 8 – CERTIFICATION

By signing this contract, the Contractor hereby re-certifies compliance with all legal requirements set forth in Section 6.0, Bidder's Certifications of the Bid Form.

By signature below, the parties hereby execute this contract document.

APPROVED:

_____
Brian Yansen, Director
Division of Facilities Management,
Design and Construction

_____
Contractor's Authorized Signature

I, Corporate Secretary, certify that I am Secretary of the corporation named above and that (CONTRACTOR NAME), who signed said contract on behalf of the corporation, was then (TITLE) of said corporation and that said contract was duly signed for and in behalf of the corporation by authority of its governing body, and is within the scope of its corporate powers.

_____
Corporate Secretary

REQUEST FOR PRE-QUALIFICATION ("RFPQ")
HISTORIC MASONY RESTORATION SPECIALIST ("Specialists" or "Respondents")

OWNER: **State of Missouri**
Office of Administration,
Division of Facilities Management,
Design & Construction, ("OA-FMDC" or "Owner")
301 West High Street, Suite 730
Jefferson City, Missouri

PROJECT TITLE AND NUMBER: **Missouri State Capitol South Fountains Restoration**
Jefferson City, Missouri
Project No. O2204-01 ("Project")

MANDATORY PRE-QUALIFICATION SITE WALK THROUGH: See Section 3.4

SUBMISSION OF STATEMENTS OF QUALIFICATIONS:

Until: **1:30PM, May 13, 2025**

To: **State of Missouri**
Office of Administration
Division of Facilities Management,
Design & Construction
Attn: Becky Mitchell
301 West High Street, Room 730
Jefferson City, MO 65101

POINT OF CONTACTS:

RFPQ and Statements of Qualifications Inquiries:
Becky Mitchell, OA-FMDC Contracts Manager
Phone: (573) 751-8884
Email: Becky.Mitchell@oa.mo.gov

Project Specific and Technical Questions:
Andrew Friedmeyer, AIA Assoc.
OA-FMDC Project Manager,
Phone: (573) 536-8019
Email: Andrew.Friedmeyer@oa.mo.gov

Respondents must direct all contact and questions regarding this RFPQ and the Project to the point of contacts listed above. Respondents may not contact any other State employee or agency regarding this RFPQ or the Project, unless otherwise authorized by OA-FMDC.

Request for Pre-Qualifications (RFPQ) information, addenda and the actual bid package information may be obtained at no cost for electronic sets on the OA-FMDC website at: https://www.oafmdcplanroom.com/jobs/public or for a small fee at American Document Solutions, Phone 573-446-7768, Fax 573-355-5433.

1.0 GENERAL INFORMATION

The State of Missouri, Office of Administration, Division of Facilities Management, Design and Construction (referred to herein as "OA-FMDC" or "Owner") is requesting Statements of Qualifications (referred to herein as "SOQ") from qualified Historic Masonry Restoration Specialists (referred to herein as "Respondent" or "Specialists") for the restoration of the South Fountains on the Grounds of the Missouri State Capitol Building, Jefferson City, Missouri ("Project"). Because the work to be performed is highly specialized and requires specific expertise and experience, the Owner has determined that pre-qualification is necessary for this Project.

This pre-qualification process is limited to the **HISTORIC MASONRY RESTORATION** component of the Capitol South Fountains Restoration Project, as described herein and in the project drawings and specifications. Pre-Qualification is not required for the remaining scope of work, except for the Masonry Cleaning component of work.

Historic Masonry Restoration Specialist will be responsible for all masonry restoration and cleaning of the two historic fountains and will supervise and coordinate the work along with the General Contractor to be conducted by the Abrasive Cleaning of Historic Masonry Contractor.

A General Contractor may bid on this Project only by contracting with a pre-qualified Historic Masonry Restoration Specialist and a pre-qualified Historic Masonry Abrasive Cleaning Specialist. A pre-qualified Historic Masonry Restoration Specialist and a pre-qualified Masonry Cleaning Specialist may bid the job as a General Contractor if able to provide the other required services.

2.0 PROJECT DESCRIPTION

2.1 Overview: This Project primarily includes work on the South Fountains on the Grounds of the Missouri State Capitol Building. They are formally known as The Fountain of Arts and The Fountain of the Sciences and are referenced to as "Fountains" in the Project plans and specifications.

The scope of work includes, but is not limited to, providing for the historic masonry needs involved in the disassembly, restoration, cleaning, refinishing and reassembly/reconstruction of the Fountains on the South Lawn of the Missouri State Capitol.

The Fountains are to be cleaned, the masonry (limestone and granite) is to be restored/replaced and repointed, and all the sealant joints are to be replaced. The Fountain concrete basins are to be stripped, concrete repaired, and new waterproofing to be installed. The Fountains' equipment is to be completely restored/replaced. Repair of existing piping or insulation of new piping. Repair of the existing pump or installation of new pump. Installation of new filtration system. Installation of new chemical system. Installation of new valves and gaskets. Installation of new underwater LED lighting. Required electrical upgrades. The landscaping immediately surrounding the Fountains is to be fully removed and replaced, including installation of new irrigation. The scope of work is defined in more detail below and in the plans and specifications:

2.2 Scope of Work for Base Bid: Restoration of the Fountain basins and sculptures. Replacement of the Fountain pump, filtering, and treatment systems in the mechanical room (located in basement of the Capitol Building). Replacement of fittings in the Fountain basins. Removal and replacement of

landscaping at Fountain basins, along with irrigation.

2.3 Scope of Work for Alternate #1: Replacement of below-grade Fountain piping to basins from the mechanical room (located in the basement of the Capitol Building) - to each of the Fountains. Refer to drawing sheets M101 and M102.

3.0 PRE-QUALIFICATION PROCESS

3.1 Overview: Historic Masonry Restoration Specialists are required to be pre-qualified in order to perform any work on the Project as either a subcontractor or General Contractor. Following pre-qualification of the Historic Masonry Restoration Specialists, the selected firms will be notified and an addendum to the bid documents will be issued with a list of the pre-qualified firms. General Contractors who wish to bid can contact qualified specialty contractors to team with in the bid process. Qualified Historic Masonry Restoration Specialists are permitted to bid as a General Contractor, if they are able to perform the work of a General Contractor.

3.2 Evaluation Process: The Owner will assign an evaluation team comprised of representatives of the design team and the Owner's staff to evaluate and score the respondent's qualifications. The evaluation team will evaluate the respondent's statements of qualifications and assign points for each category identified below.

After the evaluation team has reviewed and scored the submittals, the Owner will notify respondents if their firm was approved for work on the project. The Owner will also issue an addendum containing the list of approved Historic Masonry Restoration Specialists in order to notify all potential General Contractor bidders.

3.3 Evaluation Criteria: All respondents will be evaluated based upon organizational experience of the firm and the firm's proposed project team with projects of similar size, construction type, schedule and scope, and the other information requested below.

3.3.1 Available Points and Scoring: A total of 100 points is possible. **A minimum of 80** points is required to be qualified for the list of approved Historic Masonry Restoration Specialists for this Project. The weighting of points for the pre-qualification evaluation will be as follows:

Section Reference	Statements of Qualification Requirement	Points Assigned
3.5.2.	Cover Letter of Interest	-
3.5.3.	Project Team Makeup and Experience	40
3.5.4.	Relevant Experience and Past Performance	50
3.5.4.	Past Performance Based on References Provided	10
	Available Points	**100**

3.3.2 Mandatory Requirements: Irrespective of any point totals, the respondent must meet the mandatory, minimum requirements for pre-qualification identified throughout using the words "must" or "shall". Firms not meeting these mandatory requirements will be deemed non-responsive and will not be pre-qualified.

3.4 Anticipated Procurement Timeline: The anticipated schedule for the pre-qualification and bid process is as follows:

Request for Pre-Qualification Released	4/16/2025
Mandatory Pre-Qualification/Pre-Bid site walk through Time: 1:00PM Location: Harry S. Truman State Office Building, Room 750A	5/6/2025
Statements of Qualifications due to the Owner	5/13/2025
Evaluation of SOQ – *(Historic Masonry Restoration Specialist and Historic Masonry Abrasive Cleaning Specialist)*	5/14/2025
Notifications to all Respondents to RFPQ and those Pre-Qualified Specialists	5/16/2025
Last Addendum issued to Bidding Package	5/27/2025
Anticipated Bid Date of Bidding Package	6/10/2025
Anticipated Intent to Award of Bidding Package	6/17/2025
Anticipated Notice to Proceed of Bidding Package	6/24/2025

3.5 Submission of Statements of Qualifications:

3.5.1. Each firm shall submit one electronic copy on a flash drive and (5) hard copies of Attachment A – Statement of Qualifications Requirements.

3.5.2. Tab 1: Cover Letter of Interest, including the following certification:
Each respondent shall include a brief statement of their interest in this project along with the following information:

a. Name and Address of Firm
b. Authorized Person (printed) along with a Signature
c. Title/Position
d. Telephone Number
e. E-mail address
f. Name, Telephone and E-mail of Primary Point of Contract regarding this RFPQ certification. (the text of the following certification must be included in the Cover Letter): "I certify that I am authorized to represent the Respondent named below and that the statements contained in this Letter of Interest and submitted SOQ are true and correct:"

3.5.3. Tab 2: Each Respondent must attach the completed forms direct from Section 4.0 STATEMENT OF QUALIFICATIONS REQUIREMENTS – ATTACMENT A. Handwritten responses to this section are acceptable.

3.5.4. Tab 3: Each Respondent must attach three (3) high-resolution photos for each of the refenced projects from Section 4.0 STATEMENT OF QUALIFICATIONS REQUIREMENTS – ATTACHMENT B.

4.0 STATEMENTS OF QUALIFICATIONS REQUIREMENTS: Submit hard copies following Section 3.5 above, along with the requested information provided in Section 4.0 Attachment A.

5.0 NOTICE OF LEGAL AND CONTRACTUAL REQUIREMENTS:

5.1 Due Date:
Statements of Qualifications shall be delivered to the address provided on the first page of this RFPQ by the date and time specified or as modified via written addenda only. The Respondent is solely responsible for submitting a response on time. Late responses will not be considered.

Late submissions will not be considered and will be deemed nonresponsive.

5.2 Responsibility of Respondent to Provide Clear Information:
It is the sole responsibility of the Respondent to provide clear and complete answers and descriptions of the requested information. The Respondent's qualifications shall be evaluated based solely on the information and materials provided by the Respondent in response to this RFPQ. Failure to provide all information requested or to provide clear answers may result in a proposal being rejected or may result in lower scoring.

5.3 Questions and Communications:
All questions, requests for clarifications, requests for modifications of this RFPQ, and project specific or technical questions must be submitted in writing to **all point of contacts**; Becky Mitchell at Becky.Mitchell@oa.mo.gov or Andrew Friedmeyer at Andrew.Friedmeyer@oa.mo.gov no later than the date specified in the Pre-Qualification schedule. Respondents must restrict all contact and questions regarding this RFPQ to the individuals above, unless otherwise authorized by OA-FMDC.

No verbal interpretation made to any Respondent regarding the meaning of the RFPQ shall be binding on OA-FMDC.

5.4 Confidentiality of Submittals:
OA-FMDC is a public governmental body. The Missouri Sunshine Law (Ch. 610, RSMo) provides that all records of a public governmental body are open unless they may be closed or are closed as otherwise provided by law. All materials submitted by the Respondent in conjunction with the RFPQ becomes the property of OA-FMDC and are subject to disclosure pursuant to the Missouri Sunshine Law. The Respondent may mark submitted material as containing confidential trade secrets; however, such label is not binding on OA-FMDC. Only information expressly permitted to be closed pursuant to the provisions of Missouri law, as determined by OA-FMDC's legal counsel or as required by a court, will be treated as a closed record by OA-FMDC and withheld from any public request for records. The Respondent should presume information provided to OA-FMDC in a proposal will be public following the award of the contract or after rejection of all proposals, and will be made available upon request in accordance with the provisions of state law.

5.5 State's Rights Reserved:

OA-FMDC reserves the right to do, but is not required to do, the following:

- reject all submissions and reissue this RFQ if the submissions received are not acceptable to OA-FMDC;
- waive clerical errors in this RFQ or any submission; or
- request additional information and data from any potential Firm.

Any request for information by OA-FMDC to the potential Firms is solely for the purpose of evaluating the statement of qualifications and understanding its terms. Such a request shall not be considered to constitute a binding agreement or commitment by OA-FMDC in any manner.

5.6 Modifications to RFPQ:

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5.7 Business Registration

To be awarded a contract, any Firm that operates as a legal entity in the State of Missouri must be appropriately registered with the Missouri Secretary of State's office, and such registration must be active and in good standing. If the successful Firm is doing business in the State of Missouri under a fictitious name, the Firm must have a current Registration of Fictitious Name. If the Firm is an entity formed in another State, the Firm must have a Certificate of Authority to do business in Missouri. The Owner will typically ascertain the Firm's standing with the Missouri Secretary of State from the information available on the Secretary of State's website. However, the Owner may, at its discretion, request proof of compliance with this paragraph from the selected Firm prior to award of a contract. The Firm shall provide a certified copy of its Certificate of Good Standing, Certificate of Authority and/or Registration of Fictitious name to the Owner upon request. If the Firm fails to provide such information upon request, the Owner shall not award a contract to the Firm, and the Owner will not be under any further obligation to the Firm.

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Preferences owed to Missouri businesses will be given consistent with Chapter 34 of the Revised Statutes of Missouri (RSMo).

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Transient employers subject to sections 285.230 and 285.234, RSMo (out-of-state employers who temporarily transact any business in the State of Missouri) may be required to file a bond with the Missouri Department of Revenue. The Owner may require the Firm to certify that it has complied with all applicable provisions of sections 285.230 and 285.234, RSMo before awarding a contract.

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5.11 Anti-Discrimination Against Israel Act

If selected, the Firm will be expected to provide a certification before being awarded a contract as follows:

- If the Designer meets the definition of a company as defined in section 34.600, RSMo, and has ten or more employees, the Designer shall not engage in a boycott of goods or services from the State of Israel; from companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel; or from persons or entities doing business in the State of Israel as defined in section 34.600, RSMo.

- If, at any time during the life of the Agreement, the Designer meets the definition of a company as defined in section 34.600, RSMo, and the Designer's company's employees increases to ten or more OR the Designer's business status changes to become a company as defined in section 34.600, RSMo, and the Designer's company has ten or more employees, then the Designer shall submit to the Division of Facilities Management, Design and Construction a completed Box C of the exhibit titled "Anti-Discrimination Against Israel Act Certification, and shall comply with the requirements of Box C.

5.12 Background checks and Photo ID

If awarded a contract, the Designer's employees, and the employees of all subconsultants who perform work on the project, will be required to undergo a background check and obtain a State of Missouri identification badge prior to commencement of work.

4.0 ATTACHMENT A - STATEMENTS OF QUALIFICATIONS REQUIREMENTS

4.1 Submit hard copies following Section 3.5 above, along with the requested information provided in this Attachment.
4.2 ALL INFORMATION MUST BE COMPLETED, OR THE FORM WILL NOT BE EVALUATED AND THE SOQ WILL BE DEEMED NON-RESPONSIVE AND REJECTED.
4.3 COMPLETE COMPANY INFORMATION BELOW:

HISTORIC MASONRY RESTORATION

Firm Name: _____

Contact Name: _____

Address: _____

City, State, Zip: _____

Company Federal ID: _____

How many years has your firm been in the historic masonry restoration business? (Must be at least 10 years)? _____

Has your business operated under a different name? _____

If so, list the name. _____

Have you ever failed to complete work awarded to you? _____

If yes, where and why? _____

_____

How many people are on your current payroll? _____

How many of these people are journeymen? _____

How many of these people are superintendents for foremen? _____
Have you worked on historic masonry restoration projects for the State of Missouri? If yes, please list project name, location, and approximate date the work was performed. _____

_____

_____

4.3. HISTORIC MASONRY RESTORATION EXPERIENCE

Provide 3 example projects of similar scope and scale to the historic fountain restoration your company has completed in the last 5 years where your contract was for a minimum of $200,000. (Experience installing standard unit masonry or new stone masonry is NOT sufficient experience for historic masonry restoration work)

Example Project #1 - Project Name: _____

Owner and Location: _____

Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

Example Project #2 - Project Name: _____

Owner and Location: _____

Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

Example Project #3 - Project Name: _____

Owner and Location: _____

Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

4.4 HISTORIC MASONRY RESTORATION CURRENT WORK

Provide example of historic masonry restoration projects your company currently has under contract for a minimum of $150,000. (Experience installing standard unit masonry or new stone masonry is NOT sufficient experience for historic masonry restoration work). (Must list a minimum of 2 projects).

Example Project #1 - Project Name: _____

Owner and Location: _____

Anticipated Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

Example Project #2 - Project Name: _____

Owner and Location: _____

Anticipated Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

Example Project #3 - Project Name: _____

Owner and Location: _____

Anticipated Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

4.5 JOB SUPERINTENDENT

Name the Job Superintendent you would place on this project and give at least 3 historic masonry restoration projects they have overseen with total masonry scope of work over $150,000. The Job Superintendent must have at least 7 years of experience in historic masonry restoration and be on the jobsite at all times there is masonry work and abrasive cleaning in progress.

Masonry Superintendent Name: _____

Years of Masonry Work Experience (must be at least 7): _____

COMPLETE ALL LINE ITEMS BELOW, EVEN IF THIS IS REPETITIVE FROM SECTIONS 4.3 AND 4.4 ABOVE.

Example Project #1 - Project Name: _____

Owner and Location: _____

Anticipated Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

Example Project #2 - Project Name: _____

Owner and Location: _____

Anticipated Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

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Client / General Contractor Reference (name and phone number): _____

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Example Project #3 - Project Name: _____

Owner and Location: _____

Anticipated Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

REQUEST FOR PRE-QUALIFICATION ("RFPQ")
HISTORIC MASONY ABRASIVE CLEANING SPECIALIST ("Specialists" or "Respondents")

OWNER: **State of Missouri**
Office of Administration,
Division of Facilities Management,
Design & Construction, ("OA-FMDC" or "Owner")
301 West High Street, Suite 730
Jefferson City, Missouri

PROJECT TITLE AND NUMBER: **Missouri State Capitol South Fountains Restoration**
Jefferson City, Missouri
Project No. O2204-01 ("Project")

MANDATORY PRE-QUALIFICATION SITE WALK THROUGH: See Section 3.4

SUBMISSION OF STATEMENTS OF QUALIFICATIONS:

Until: **1:30PM, May 13, 2025**

To: **State of Missouri**
Office of Administration
Division of Facilities Management,
Design & Construction
Attn: Becky Mitchell
301 West High Street, Room 730
Jefferson City, MO 65101

POINT OF CONTACTS:

RFPQ and Statements of Qualifications Inquiries:
Becky Mitchell, OA-FMDC Contracts Manager
Phone: (573) 751-8884
Email: Becky.Mitchell@oa.mo.gov

Project Specific and Technical Questions:
Andrew Friedmeyer, AIA Assoc.
OA-FMDC Project Manager,
Phone: (573) 536-8019
Email: Andrew.Friedmeyer@oa.mo.gov

Respondents must direct all contact and questions regarding this RFPQ and the Project to the point of contacts listed above. Respondents may not contact any other State employee or agency regarding this RFPQ or the Project, unless otherwise authorized by OA-FMDC.

Request for Pre-Qualifications (RFPQ) information, addenda and the actual bid package information may be obtained at no cost for electronic sets on the OA-FMDC website at: https://www.oafmdcplanroom.com/jobs/public or for a small fee at American Document Solutions, Phone 573-446-7768, Fax 573-355-5433.

1.0 GENERAL INFORMATION

The State of Missouri, Office of Administration, Division of Facilities Management, Design and Construction (referred to herein as "OA-FMDC" or "Owner") is requesting Statements of Qualifications (referred to herein as "SOQ") from qualified Historic Masonry Abrasive Cleaning Specialists (referred to herein as "Respondent" or "Specialists") for the restoration of the South Fountains on the Grounds of the Missouri State Capitol Building, Jefferson City, Missouri ("Project"). Because the work to be performed is highly specialized and requires specific expertise and experience, the Owner has determined that pre-qualification is necessary for this Project.

This pre-qualification process is limited to the **HISTORIC MASONRY ABRASIVE CLEANING** component of the Capitol South Fountains Restoration Project, as described herein and in the project drawings and specifications. Pre-Qualification is not required for the remaining scope of work, except for the Masonry Restoration component of work.

Historic Masonry Abrasive Cleaning Specialist will be responsible for all masonry restoration and cleaning of the two historic fountains and will supervise and coordinate the work along with the General Contractor to be conducted by the Restoration of Historic Masonry Contractor.

A General Contractor may bid on this Project only by contracting with a pre-qualified Historic Masonry Restoration Specialist and a pre-qualified Historic Masonry Abrasive Cleaning Specialist. A pre-qualified Historic Masonry Restoration Specialist and a pre-qualified Masonry Cleaning Specialist may bid the job as a General Contractor if able to provide the other required services.

2.0 PROJECT DESCRIPTION

2.1 Overview: This Project primarily includes work on the South Fountains on the Grounds of the Missouri State Capitol Building. They are formally known as The Fountain of Arts and The Fountain of the Sciences and are referenced to as "Fountains" in the Project plans and specifications.

The scope of work includes, but is not limited to, providing for the historic masonry needs involved in the disassembly, restoration, cleaning, refinishing and reassembly/reconstruction of the Fountains on the South Lawn of the Missouri State Capitol.

The Fountains are to be cleaned, the masonry (limestone and granite) is to be restored/replaced and repointed, and all the sealant joints are to be replaced. The Fountain concrete basins are to be stripped, concrete repaired, and new waterproofing to be installed. The Fountains' equipment is to be completely restored/replaced. Repair of existing piping or insulation of new piping. Repair of the existing pump or installation of new pump. Installation of new filtration system. Installation of new chemical system. Installation of new valves and gaskets. Installation of new underwater LED lighting. Required electrical upgrades. The landscaping immediately surrounding the Fountains is to be fully removed and replaced, including installation of new irrigation. The scope of work is defined in more detail below and in the plans and specifications:

2.2 Scope of Work for Base Bid: Restoration of the Fountain basins and sculptures. Replacement of the Fountain pump, filtering, and treatment systems in the mechanical room (located in basement of the Capitol Building). Replacement of fittings in the Fountain basins. Removal and replacement of

landscaping at Fountain basins, along with irrigation.

2.3 Scope of Work for Alternate #1: Replacement of below-grade Fountain piping to basins from the mechanical room (located in the basement of the Capitol Building) - to each of the Fountains. Refer to drawing sheets M101 and M102.

3.0 PRE-QUALIFICATION PROCESS

3.1 Overview: Historic Masonry Abrasive Cleaning Specialists are required to be pre-qualified in order to perform any work on the Project as either a subcontractor or General Contractor. Following pre-qualification of the Historic Masonry Abrasive Cleaning Specialists, the selected firms will be notified and an addendum to the bid documents will be issued with a list of the pre-qualified firms. General Contractors who wish to bid can contact qualified specialty contractors to team with in the bid process. Qualified Historic Masonry Abrasive Cleaning Specialists are permitted to bid as a General Contractor, if they are able to perform the work of a General Contractor.

3.2 Evaluation Process: The Owner will assign an evaluation team comprised of representatives of the design team and the Owner's staff to evaluate and score the respondent's qualifications. The evaluation team will evaluate the respondent's statements of qualifications and assign points for each category identified below.

After the evaluation team has reviewed and scored the submittals, the Owner will notify respondents if their firm was approved for work on the project. The Owner will also issue an addendum containing the list of approved Historic Masonry Abrasive Cleaning Specialists in order to notify all potential General Contractor bidders.

3.3 Evaluation Criteria: All respondents will be evaluated based upon organizational experience of the firm and the firm's proposed project team with projects of similar size, construction type, schedule and scope, and the other information requested below.

3.3.1 Available Points and Scoring: A total of 100 points is possible. **A minimum of 80** points is required to be qualified for the list of approved Historic Masonry Abrasive Cleaning Specialists for this Project. The weighting of points for the pre-qualification evaluation will be as follows:

Section Reference	Statements of Qualification Requirement	Points Assigned
3.5.2.	Cover Letter of Interest	-
3.5.3.	Project Team Makeup and Experience	40
3.5.4.	Relevant Experience and Past Performance	50
3.5.4.	Past Performance Based on References Provided	10
	Available Points	**100**

3.3.2 Mandatory Requirements: Irrespective of any point totals, the respondent must meet the mandatory, minimum requirements for pre-qualification identified throughout using the words "must" or "shall". Firms not meeting these mandatory requirements will be deemed non-responsive and will not be pre-qualified.

3.4 Anticipated Procurement Timeline: The anticipated schedule for the pre-qualification and bid process is as follows:

Request for Pre-Qualification Released	4/16/2025
Mandatory Pre-Qualification/Pre-Bid site walk through Time: 1:00PM Location: Harry S. Truman State Office Building, Room 750A	5/6/2025
Statements of Qualifications due to the Owner	5/13/2025
Evaluation of SOQ – *(Historic Masonry Restoration Specialists and Historic Masonry Abrasive Cleaning Specialists)*	5/14/2025
Notifications to all Respondents to RFPQ and those Pre-Qualified Specialists	5/16/2025
Last Addendum issued to Bidding Package	5/27/2025
Anticipated Bid Date of Bidding Package	6/10/2025
Anticipated Intent to Award of Bidding Package	6/17/2025
Anticipated Notice to Proceed of Bidding Package	6/24/2025

3.5 Submission of Statements of Qualifications:

3.5.1. Each firm shall submit one electronic copy on a flash drive and (5) hard copies of Attachment A – Statement of Qualifications Requirements.

3.5.2. Tab 1: Cover Letter of Interest, including the following certification:
Each respondent shall include a brief statement of their interest in this project along with the following information:

a. Name and Address of Firm
b. Authorized Person (printed) along with a Signature
c. Title/Position
d. Telephone Number
e. E-mail address
f. Name, Telephone and E-mail of Primary Point of Contract regarding this RFPQ certification. (the text of the following certification must be included in the Cover Letter): "I certify that I am authorized to represent the Respondent named below and that the statements contained in this Letter of Interest and submitted SOQ are true and correct:"

3.5.3. Tab 2: Each Respondent must attach the completed forms direct from Section 4.0 STATEMENT OF QUALIFICATIONS REQUIREMENTS – ATTACMENT A. Handwritten responses to this section are acceptable.

3.5.4. Tab 3: Each Respondent must attach three (3) high-resolution photos for each of the refenced projects from Section 4.0 STATEMENT OF QUALIFICATIONS REQUIREMENTS – ATTACHMENT B.

4.0 STATEMENTS OF QUALIFICATIONS REQUIREMENTS: Submit hard copies following Section 3.5 above, along with the requested information <u>provided in Section 4.0 Attachment A.</u>

5.0 NOTICE OF LEGAL AND CONTRACTUAL REQUIREMENTS:

5.1 Due Date:
Statements of Qualifications shall be delivered to the address provided on the first page of this RFPQ by the date and time specified or as modified via written addenda only. The Respondent is solely responsible for submitting a response on time. Late responses will not be considered.

Late submissions will not be considered and will be deemed nonresponsive.

5.2 Responsibility of Respondent to Provide Clear Information:
It is the sole responsibility of the Respondent to provide clear and complete answers and descriptions of the requested information. The Respondent's qualifications shall be evaluated based solely on the information and materials provided by the Respondent in response to this RFPQ. Failure to provide all information requested or to provide clear answers may result in a proposal being rejected or may result in lower scoring.

5.3 Questions and Communications:
All questions, requests for clarifications, requests for modifications of this RFPQ, and project specific or technical questions must be submitted in writing to **all point of contacts**; Becky Mitchell at Becky.Mitchell@oa.mo.gov or Andrew Friedmeyer at Andrew.Friedmeyer@oa.mo.gov no later than the date specified in the Pre-Qualification schedule. Respondents must restrict all contact and questions regarding this RFPQ to the individuals above, unless otherwise authorized by OA-FMDC.

No verbal interpretation made to any Respondent regarding the meaning of the RFPQ shall be binding on OA-FMDC.

5.4 Confidentiality of Submittals:
OA-FMDC is a public governmental body. The Missouri Sunshine Law (Ch. 610, RSMo) provides that all records of a public governmental body are open unless they may be closed or are closed as otherwise provided by law. All materials submitted by the Respondent in conjunction with the RFPQ becomes the property of OA-FMDC and are subject to disclosure pursuant to the Missouri Sunshine Law. The Respondent may mark submitted material as containing confidential trade secrets; however, such label is not binding on OA-FMDC. Only information expressly permitted to be closed pursuant to the provisions of Missouri law, as determined by OA-FMDC's legal counsel or as required by a court, will be treated as a closed record by OA-FMDC and withheld from any public request for records. The Respondent should presume information provided to OA-FMDC in a proposal will be public following the award of the contract or after rejection of all proposals, and will be made available upon request in accordance with the provisions of state law.

5.5 State's Rights Reserved:

OA-FMDC reserves the right to do, but is not required to do, the following:

- reject all submissions and reissue this RFQ if the submissions received are not acceptable to OA-FMDC;
- waive clerical errors in this RFQ or any submission; or
- request additional information and data from any potential Firm.

Any request for information by OA-FMDC to the potential Firms is solely for the purpose of evaluating the statement of qualifications and understanding its terms. Such a request shall not be considered to constitute a binding agreement or commitment by OA-FMDC in any manner.

5.6 Modifications to RFPQ:

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- If, at any time during the life of the Agreement, the Designer meets the definition of a company as defined in section 34.600, RSMo, and the Designer's company's employees increases to ten or more OR the Designer's business status changes to become a company as defined in section 34.600, RSMo, and the Designer's company has ten or more employees, then the Designer shall submit to the Division of Facilities Management, Design and Construction a completed Box C of the exhibit titled "Anti-Discrimination Against Israel Act Certification, and shall comply with the requirements of Box C.

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4.3 COMPLETE COMPANY INFORMATION BELOW:

HISTORIC MASONRY ABRASIVE CLEANING

Firm Name: _____

Contact Name: _____

Address: _____

City, State, Zip: _____

Company Federal ID: _____

How many years has your firm been in the historic masonry abrasive cleaning business? (Must be at least 10 years)? _____

Has your business operated under a different name? _____

If so, list the name. _____

Have you ever failed to complete work awarded to you? _____

If yes, where and why? _____

_____

How many people are on your current payroll? _____

How many of these people are journeymen? _____

How many of these people are superintendents for foremen? _____

Have you worked on historic masonry abrasive cleaning projects for the State of Missouri? If yes, please list project name, location, and approximate date the work was performed. _____

_____

_____

4.3. HISTORIC MASONRY CLEANING EXPERIENCE

Provide 3 example projects of similar scope and scale to the historic fountain abrasive cleaning your company has completed in the last 5 years where your contract was for a minimum of $200,000. (Experience cleaning standard unit masonry or new stone masonry is NOT sufficient experience for historic masonry abrasive cleaning work)

Example Project #1 - Project Name: _____

Owner and Location: _____

Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

Example Project #2 - Project Name: _____

Owner and Location: _____

Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

Example Project #3 - Project Name: _____

Owner and Location: _____

Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

4.4 HISTORIC MASONRY ABRASIVE CLEANING CURRENT WORK

Provide example of historic masonry abrasive cleaning projects your company currently has under contract for a minimum of $150,000. (Experience cleaning standard unit masonry or new stone masonry is NOT sufficient experience for historic masonry abrasive cleaning work). (Must list a minimum of 2 projects).

Example Project #1 - Project Name: _____

Owner and Location: _____

Anticipated Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

Example Project #2 - Project Name: _____

Owner and Location: _____

Anticipated Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

Example Project #3 - Project Name: _____

Owner and Location: _____

Anticipated Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

4.5 JOB SUPERINTENDENT

Name the Job Superintendent you would place on this project and give at least 3 historic masonry abrasive cleaning projects they have overseen with total masonry scope of work over $150,000. The Job Superintendent must have at least 7 years of experience in historic masonry abrasive cleaning and be on the jobsite at all times there is masonry work and abrasive cleaning in progress.

Masonry Superintendent Name: _____

Years of Masonry Work Experience (must be at least 7): _____

COMPLETE ALL LINE ITEMS BELOW, EVEN IF THIS IS REPETITIVE FROM SECTIONS 4.3 AND 4.4 ABOVE.

Example Project #1 - Project Name: _____

Owner and Location: _____

Anticipated Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

Example Project #2 - Project Name: _____

Owner and Location: _____

Anticipated Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

Example Project #3 - Project Name: _____

Owner and Location: _____

Anticipated Completion Date: _____

Masonry Budget: _____

Scope of Work (list masonry work): _____

_____

Client / General Contractor Reference (name and phone number): _____

_____

Bond No._____

SECTION 006113 - PERFORMANCE AND PAYMENT BOND FORM

KNOW ALL MEN BY THESE PRESENTS, THAT we _____

as principal, and _____

_____as Surety, are held and firmly bound unto the

STATE OF MISSOURI. in the sum of _____ Dollars ($)

for payment whereof the Principal and Surety bind themselves, their heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

WHEREAS, the Principal has, by means of a written agreement dated the _____

day of_____, 20_____, enter into a contract with the State of Missouri for

_____

_____

_____

(Insert Project Title and Number)

NOW, THEREFORE, if the Principal shall faithfully perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the State of Missouri, with or without notice to the Surety and during the life of any guaranty required under the contract; and shall also faithfully perform and fulfill all undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said contract that may hereafter be made with or without notice to the Surety; and shall also promptly make payment for materials incorporated, consumed or used in connection with the work set forth in the contract referred to above, and all insurance premiums, both compensation and all other kinds of insurance, on said work, and for all labor performed on such work, whether by subcontractor or otherwise, at not less than the prevailing hourly rate of wages for work of a similar character (exclusive of maintenance work) in the locality in which the work is performed and not less than the prevailing hourly rate of wages for legal holiday and overtime work (exclusive of maintenance work) in the locality in which the work is performed both as determined by the Department of Labor and Industrial Relations or determined by the Court of Appeal, as provided for in said contract and in any and all duly authorized modifications of said contract that may be hereafter made, with or without notice to the Surety, then, this obligation shall be void and of no effect, but it is expressly understood that if the Principal should make default in or should fail to strictly, faithfully and efficiently do, perform and comply with any or more of the covenants, agreements, stipulations, conditions, requirements or undertakings, as specified in or by the terms of said contract, and with the time therein named, then this obligation shall be valid and binding upon each of the parties hereto and this bond shall remain in full force and effect; and the same may be sued on at the instance of any material man, laborer, mechanic, subcontractor, individual, or otherwise to whom such payment is due, in the name of the State of Missouri, to the use of any such person.

AND, IT IS FURTHER specifically provided that any modifications which may hereinafter be made in the terms of the contract or in the work to be done under it or the giving by the Owner of any extension of the time for the performance of the contract or any other forbearance on the part of either the Owner or the Principal to the other, shall not in any way release the Principal and the Surety, or either or any of them, their heirs, executors, administrators and successors, from their liability hereunder, notice to the Surety of any such extension, modifications or forbearance being hereby waived.

IN WITNESS WHEREOF, the above bounden parties have executed the within instrument this _____ day of _____, 20 ____.

AS APPLICABLE:

AN INDIVIDUAL

Name: _____

Signature: _____

A PARTNERSHIP

Name of Partner: _____

Signature of Partner: _____

Name of Partner: _____

Signature of Partner: _____

CORPORATION

Firm Name: _____

Signature of President: _____

SURETY

Surety Name: _____

Attorney-in-Fact: _____

Address of Attorney-in-Fact: _____

_____

Telephone Number of Attorney-in-Fact: _____

Signature Attorney-in-Fact: _____

NOTE: Surety shall attach Power of Attorney

STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

PRODUCT SUBSTITUTION REQUEST

PROJECT NUMBER

PROJECT TITLE AND LOCATION

CHECK APPROPRIATE BOX

☐ SUBSTITUTION PRIOR TO BID OPENING
(Minimum of (5) working days prior to receipt of Bids as per Article 4 – Instructions to Bidders)

☐ SUBSTITUTION FOLLOWING AWARD
(Maximum of (20) working days from Notice to Proceed as per Article 3 – General Conditions)

FROM: BIDDER/CONTRACTOR (PRINT COMPANY NAME)

TO: ARCHITECT/ENGINEER (PRINT COMPANY NAME)

Bidder/Contractor hereby requests acceptance of the following product or systems as a substitution in accordance with provisions of Division One of the Bidding Documents:

SPECIFIED PRODUCT OR SYSTEM

SPECIFICATION SECTION NO.

SUPPORTING DATA

☐ Product data for proposed substitution is attached (include description of product, standards, performance, and test data)

☐ Sample ☐ Sample will be sent, if requested

QUALITY COMPARISON

	SPECIFIED PRODUCT	SUBSTITUTION REQUEST
NAME, BRAND		
CATALOG NO.		
MANUFACTURER		
VENDOR		

PREVIOUS INSTALLATIONS

PROJECT	ARCHITECT/ENGINEER	
LOCATION		DATE INSTALLED

SIGNIFICANT VARIATIONS FROM SPECIFIED PRODUCT

REASON FOR SUBSTITUTION

_____

_____

_____

_____

_____

_____

DOES PROPOSED SUBSTITUTION AFFECT OTHER PARTS OF WORK?

☐ YES ☐ NO

IF YES, EXPLAIN _____

_____

_____

_____

_____

_____

SUBSTITUTION REQUIRES DIMENSIONAL REVISION OR REDESIGN OF STRUCTURE OR A/E WORK

☐ YES ☐ NO

BIDDER'S/CONTRACTOR'S STATEMENT OF CONFORMANCE OF PROPOSED SUBSTITUTION TO CONTRACT REQUIREMENT:

We have investigated the proposed substitution. We believe that it is equal or superior in all respects to specified product, except as stated above; that it will provide the same Warranty as specified product; that we have included complete implications of the substitution; that we will pay redesign and other costs caused by the substitution which subsequently become apparent; and that we will pay costs to modify other parts of the Work as may be needed, to make all parts of the Work complete and functioning as a result of the substitution.

BIDDER/CONTRACTOR	DATE

REVIEW AND ACTION

☐ Resubmit Substitution Request with the following additional information:

_____

☐ Substitution is accepted.

☐ Substitution is accepted with the following comments:

_____

☐ Substitution is not accepted.

ARCHITECT/ENGINEER	DATE

STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

FINAL RECEIPT OF PAYMENT AND RELEASE

PROJECT NUMBER

KNOW ALL MEN BY THESE PRESENT THAT: hereinafter called "Subcontractor" who heretofore entered into an agreement with hereinafter called "Contractor", for the performance of work and/or furnishing of material for the construction of the project entitled

(PROJECT TITLE, PROJECT LOCATION, AND PROJECT NUMBER)

at

(ADDRESS OF PROJECT)

for the State of Missouri (Owner) which said subcontract is by this reference incorporated herein, in consideration of such final payment by Contractor.

DOES HEREBY:

1. ACKNOWLEDGE that they have been **PAID IN FULL** all sums due for work and materials contracted or done by their Subcontractors, Material Vendors, Equipment and Fixture Suppliers, Agents and Employees, or otherwise in the performance of the Work called for by the aforesaid Contract and all modifications or extras or additions thereto, for the construction of said project or otherwise.
2. RELEASE and fully, finally, and forever discharge the Owner from any and all suits, actions, claims, and demands for payment for work performed or materials supplied by Subcontractor in accordance with the requirements of the above referenced Contract.
1. REPRESENT that all of their Employees, Subcontractors, Material Vendors, Equipment and Fixture Suppliers, and everyone else has been **paid in full** all sums due them, or any of them, in connection with performance of said Work, or anything done or omitted by them, or any of them in connection with the construction of said improvements, or otherwise.

DATED this day of , 20 .

NAME OF SUBCONTRACTOR

BY (TYPED OR PRINTED NAME)

SIGNATURE

TITLE

ORIGINAL: FILE/Closeout Documents

STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT,
DESIGN AND CONSTRUCTION

PAY APP NO.	PROJECT NUMBER
CHECK IF FINAL ☐**FINAL**	DATE

MBE/WBE/SDVE PROGRESS REPORT

Remit with **ALL** Progress and Final Payments

(Please check appropriate box) ☐CONSULTANT ☐CONSTRUCTION

PROJECT TITLE	
PROJECT LOCATION	
FIRM	
ORIGINAL CONTRACT SUM (Same as Line Item 1. on Form A of Application for Payment) **$**	TOTAL CONTRACT SUM TO DATE (Same as Line Item 3. on Form A of Application for Payment) **$**

THE TOTAL MBE/WBE/SDVE PARTICIPATION DOLLAR AMOUNT OF THIS PROJECT AS INDICATED IN THE ORIGINAL CONTRACT: **$**

SELECT MBE, WBE, SDVE	ORIGINAL CONTRACT PARTICIPATION AMOUNT	PARTICIPATION AMOUNT PAID-TO-DATE (includes approved contract changes)	CONSULTANT/SUBCONSULTANT OR CONTRACTOR/SUBCONTRACTOR/SUPPLIER COMPANY NAME
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	

Revised 06/2023

INSTRUCTIONS FOR MBE/WBE/SDVE PROGRESS REPORT

CONTRACTOR OR CONSULTANT TO FILL OUT AND REMIT WITH EACH PAY APPLICATION:

The MBE/WBE/SDVE Progress Report for the project is issued with the contract comprising values reported in the consultant's Proposal or on the successful contractor's Section 004337 Compliance Evaluation Forms.

At Initial Pay Application fill in the following:

1. Pay App No. Start with 1.
2. Fill in the Project Number and Date.
3. Enter Project Title, Project Location, and Firm.
4. Fill in the "Original Contract Sum" and "Total Contract Sum To Date" (Reference applicable Line Items on Form A of Application for Payment).
5. Indicate the Total Participation Dollar Amount from the Original Contract.
6. Select MBE, WBE, or SDVE for each Consultant/Subconsultant or Contractor/Subcontractor/Supplier.
7. Enter the "Total Amount of Subcontract", "$ Amount (Paid-To-Date)", and Company Name.

For all subsequent Pay Applications fill in the following:

1. Pay App No.
2. If Final Pay App, check box.
3. Fill in the Project Number and Date.
4. Enter Project Title, Project Location, and Firm
5. At each Pay App fill in the "Original Contract Sum" and "Total Contract Sum To Date" (reference applicable Line Items on Form A of Application for Payment).
6. Indicate the Total Participation Dollar Amount from the Original Contract.
7. Select MBE, WBE, or SDVE for each Consultant/Subconsultant or Contractor/Subcontractor/Supplier
8. Enter the "Total Amount of Subcontract", "$ Amount (Paid-To-Date)", and Company Name.

STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION
AFFIDAVIT – COMPLIANCE WITH PREVAILING WAGE LAW

PROJECT NUMBER

Before me, the undersigned Notary Public, in and for the County of _____

State of _____ personally came and appeared _____
(NAME)

_____ of the _____
(POSITION) (NAME OF THE COMPANY)

(a corporation) (a partnership) (a proprietorship) and after being duly sworn did depose and say that all provisions and requirements set out in Chapter 290, Sections 290.210 through and including 290.340, Missouri Revised Statutes, pertaining to the payment of wages to workmen employed on public works project have been fully satisfied and there has been no exception to the full and completed compliance with said provisions and requirements and with Wage Determination No: _____ issued by the Department of Labor and Industrial Relations, State of Missouri on the _____ day of _____ 20 __ in carrying out the contract and working in connection with _____
(NAME OF PROJECT)

Located at _____ in _____ County
(NAME OF THE INSTITUTION)

Missouri, and completed on the _____ day of _____ 20 __

SIGNATURE

NOTARY INFORMATION

NOTARY PUBLIC EMBOSSER OR BLACK INK RUBBER STAMP SEAL	STATE		COUNTY (OR CITY OF ST. LOUIS)
	SUBSCRIBED AND SWORN BEFORE ME, THIS DAY OF YEAR		**USE RUBBER STAMP IN CLEAR AREA BELOW**
	NOTARY PUBLIC SIGNATURE	MY COMMISSION EXPIRES	
	NOTARY PUBLIC NAME (TYPED OR PRINTED)		

FILE: Closeout Documents

GENERAL CONDITIONS

INDEX

A. These General Conditions apply to each section of these specifications. The Contractor is subject to the provisions contained herein.

B. The General Conditions are intended to define the relationship of the Owner, the Designer and the Contractor thereby establishing certain rules and provisions governing the operation and performance of the work so that the work may be performed in a safe, orderly, expeditious and workmanlike manner.

ARTICLE 1 – GENERAL PROVISIONS

ARTICLE 1.1 - DEFINITIONS

As used in these contract documents, the following terms shall have the meanings and refer to the parties designated in these definitions.

1. **"COMMISSIONER":** The Commissioner of the Office of Administration.
2. **"CONSTRUCTION DOCUMENTS":** The "Construction Documents" shall consist of the Project Manual, Drawings and Addenda.
3. **"CONSTRUCTION REPRESENTATIVE:"** Whenever the term "Construction Representative" is used, it shall mean the Owner's Representative at the work site.
4. **"CONTRACTOR"**: Party or parties who have entered into a contract with the Owner to furnish work under these specifications and drawings.
5. **"DESIGNER"**: When the term "Designer" is used herein, it shall refer to the Architect, Engineer, or Consultant of Record specified and defined in Paragraph 2.0 of the Supplemental Conditions, or his duly authorized representative. The Designer may be either a consultant or state employee.
6. **"DIRECTOR"**: Whenever the term "Director" is used, it shall mean the Director of the Division of Facilities Management, Design and Construction or his Designee, representing the Office of Administration, State of Missouri. The Director is the agent of the Owner.
7. **"DIVISION":** Shall mean the Division of Facilities Management, Design and Construction, State of Missouri.
8. **"INCIDENTAL JOB BURDENS":** Shall mean those expenses relating to the cost of work, incurred either in the home office or on the job-site, which are necessary in the course of doing business but are incidental to the job. Such costs include office supplies and equipment, postage, courier services, telephone expenses including long distance, water and ice and other similar expenses.
9. **"JOINT VENTURE"**: An association of two (2) or more businesses to carry out a single business enterprise for profit for which purpose they combine their property, capital, efforts, skills and knowledge.
10. **"OWNER"**: Whenever the term "Owner" is used, it shall mean the State of Missouri. Acting by and through the Office of Administration, Division of Facilities Management, Design and Construction.
11. **"PROJECT"**: Wherever the term "Project" is used, it shall mean the work required to be completed by the construction contract.
12. **"PROJECT MANUAL"**: The "Project Manual" shall consist of Introductory Information, Invitation for Bid, Instructions to Bidders, Bid Documents, Additional Information, Standard Forms, General Conditions, Supplemental General Conditions, General Requirements and Technical Specifications.
13. **"SUBCONTRACTOR"**: Party or parties who contract under, or for the performance of part or this entire Contract between the Owner and Contractor. The subcontract may or may not be direct with the Contractor.
14. **"WORK"**: All supervision, labor, materials, tools, supplies, equipment, and any incidental operations and/or activities required by or reasonably inferable from the Contract Documents necessary to construct the Project and to produce the results intended by the Contract Documents in a safe, expeditious, orderly, and workmanlike manner so that the project shall be complete and finished in the best manner known to each respective trade.
15. "**WORKING DAYS**": are all calendar days except Saturdays, Sundays and the following holidays: New Year's Day, Martin Luther King, Jr. Day, Lincoln Day, Washington's Birthday (observed), Truman Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Columbus Day, Veterans Day (observed), Thanksgiving Day, Christmas Day.

ARTICLE 1.2 DRAWINGS AND SPECIFICATIONS

A. In case of discrepancy between drawings and specifications, specifications shall govern. Should discrepancies in architectural drawings, structural drawings and mechanical drawings occur, architectural drawings shall govern and, in case of conflict between structural and mechanical drawings, structural drawings shall govern.

B. Specifications are separated into titled divisions for convenience of reference only and to facilitate letting of contracts and subcontracts. The Contractor is responsible for establishing the scope of work for subcontractors, which may cross titled divisions. Neither the Owner nor Designer will establish limits and jurisdiction of subcontracts.

C. Figured dimensions take precedence over scaled measurements and details over smaller scale general drawings. In the event of conflict between any of the documents contained within the contract, the documents shall take precedence and be controlling in the following sequence: addenda, supplementary general conditions, general conditions, division 1 specifications, technical division specifications, drawings, bid form and instructions to bidders.

D. Anything shown on drawings and not mentioned in these specifications or vice versa, as well as any incidental work which is obviously necessary to complete the project within the limits established by the drawings and specifications, although not shown on or described therein, shall be performed by the Contractor at no additional cost as a part of his contract.

E. Upon encountering conditions differing materially from those indicated in the contract documents, the Contractor shall promptly notify the Designer and Construction Representative in writing before such conditions are disturbed. The Designer shall promptly investigate said conditions and report to the Owner, with a recommended course of action**.** If conditions do materially differ and cause an increase or decrease in contract cost or time required for completion of any portion of the work, a contract change will be initiated as outlined in Article 4 of these General Conditions.

E. Only work included in the contract documents is authorized, and the Contractor shall do no work other than that described therein or in accordance with appropriately authorized and approved contract changes.

ARTICLE 1.3 - COMPLIANCE WITH LAWS, PERMITS, REGULATIONS AND INSPECTIONS

A. Since the Owner is the State of Missouri, municipal or political subdivisions, zoning ordinances, construction codes (other than licensing of trades), and other like ordinances are not applicable to construction on Owner's property, and Contractor will not be required to submit drawings and specifications to any municipal or political subdivision, authority, obtain construction permits or any other licenses (other than licensing of trades) or permits from or submit to inspections by any municipality or political subdivision relating to the construction for this project. All permits or licenses required by municipality or political subdivision for operation on property not belonging to Owner shall be obtained by and paid for by Contractor. Each Contractor shall comply with all applicable laws, ordinances, rules and regulations that pertain to the work of this contract.

B. Contractors, subcontractors and their employees engaged in the businesses of electrical, mechanical, plumbing, carpentry, sprinkler system work, and other construction related trades shall be licensed to perform such work by the municipal or political subdivision where the project is located, if such licensure is required by local code. Local codes shall dictate the level (master, journeyman, and apprentice) and the number, type and ratio of licensed tradesmen required for this project within the jurisdiction of such municipal or political subdivision.

C. Equipment and controls manufacturers and their authorized service and installation technicians that do not maintain an office within the jurisdiction of the municipal or political subdivision but are a listed or specified contractor or subcontractor on this project are exempt from Paragraph 1.3 B above.

D. The Contractor shall post a copy of the wage determination issued for the project and included as a part of the contract documents, in a prominent and easily accessible location at the site of construction for the duration of the project.

E. Any contractor or subcontractor to such contractor at any tier signing a contract to work on this project shall provide a ten-hour Occupational Safety and Health Administration (OSHA) construction safety program for their on-site employees which includes a course in construction safety and health approved by OSHA or a similar program approved by the Department of Labor and Industrial Relations which is at least as stringent as an approved OSHA program. The contractor shall forfeit as a penalty to the public body on whose

behalf the contract is made or awarded, two thousand five hundred dollars plus one hundred dollars for each employee employed by the contractor or subcontractor, for each calendar day, or portion thereof, such employee is employed without the required training.

ARTICLE 1.4 - NONDISCRIMINATION IN EMPLOYMENT

A. The Contractor and his subcontractors will not discriminate against individuals based on race, color, religion, national origin, sex, disability, or age, but may use restrictions which relate to bona fide occupational qualifications. Specifically, the Contractor and his subcontractors shall not discriminate:

1. Against recipients of service on the basis of race, color, religion, national origin, sex, disability or age.
2. Against any employee or applicant, for employment on the basis of race, color, religion, national origin, sex or otherwise qualified disability status.
3. Against any applicant for employment or employee on the basis of age, where such applicant or employee is between ages 40 and 70 and where such Contractor employs at least 20 persons.
4. Against any applicant for employment or employee on the basis of that person's status as a disabled or Vietnam-era veteran.

The Contractor and his Subcontractors will ensure applicants for employment and employees are treated equally without regard to race, color, religion, national origin, sex, disability, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion and transfer; recruitment or recruitment advertising; and selection for training, including apprenticeship. The Contractor and his Subcontractors will give written notice of their commitments under this clause to any labor union with which they have bargaining or other agreements under this clause to any labor union with which they have bargaining or other agreements.

B. In the event of the Contractor's or his subcontractor's noncompliance with any provisions of this Article of the Contract, the Owner may cancel this contract in whole or in part or require the Contractor to terminate his contract with the subcontractor.

ARTICLE 1.5 - ANTI-KICKBACK

No employee of the division, shall have or acquire any pecuniary interest, whether direct or indirect, in this contract or in any part hereof. No officer, employee, designer, attorney, or administrator of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall have or acquire any pecuniary interest, whether direct or indirect, in this contract, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

ARTICLE 1.6 - PATENTS AND ROYALTIES

A. The Contractor shall hold and save the Owner and its officers, agents, servants, and employees harmless from liabilities of any nature or kind, including cost and expenses, for, or on account of, any patented or unpatented invention, process, article or appliance manufactured or used in the performance of this contract, including its use by the Owner, unless otherwise specifically stipulated in the contract documents.

B. If the Contractor uses any design, device or materials covered by letters, patent or copyright, the Contractor shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device or material. It is mutually agreed and understood, without exception, that the contract prices shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The Contractor and/or his sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract and shall indemnify the Owner for any cost, expense or damage it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

ARTICLE 1.7 - PREFERENCE FOR AMERICAN AND MISSOURI PRODUCTS AND SERVICES

A. By virtue of statutory authority a preference will be given to Missouri labor and to products of mines, forests and quarries of the state of Missouri when they are found in marketable quantities in the state, and all such materials shall be of the best quality and suitable character that can be obtained at reasonable market prices, all as provided for in Section 8.280, Missouri Revised Statutes and Cumulative Supplements.

B. Furthermore, pursuant to Section 34.076 Missouri Revised Statutes and Cumulative Supplements, a preference shall be given to those persons doing business as Missouri firms, corporations, or individuals, or which maintain Missouri offices or places of business, when the quality of performance promised is equal or better and the price quoted is the same or less. In addition, in order for a non-domiciliary bidder to be successful, his bid must be that same percentage lower than a domiciliary Missouri bidder's bid, as would be required for a Missouri bidder to successfully bid in the non-domiciliary state.

C In accordance with the Missouri Domestic Products Procurement Act Section 34.350 RSMo and Cumulative Supplements any manufactured goods or commodities used or supplied in the performance of this contract or any subcontract thereto shall be manufactured, assembled or produced in the United States, unless the specified products are not manufactured, assembled or produced in the United States in sufficient quantities to meet the agency's requirements or cannot be manufactured, assembled or produced in the United States within the necessary time in sufficient quantities to meet the contract requirements, or if obtaining the specified products manufactured, assembled or produced in the United States would increase the cost of this contract for purchase of the product by more than ten percent.

ARTICLE 1.8 - COMMUNICATIONS

A. All notices, requests, instructions, approvals, and claims must be in writing and shall be delivered to the Designer and copied to the Construction Representative for the project except as required by Article 1.12 Disputes and Disagreements, or as otherwise specified by the Owner in writing as stated in Section 012600. Any such notice shall be deemed to have been given as of the time of actual receipt.

B. The Contractor shall attend on-site progress and coordination meetings, as scheduled by the Construction Representative, no less than once a month.

C. The Contractor shall ensure that major subcontractors and suppliers shall attend monthly progress meetings as necessary to coordinate the work, and as specifically requested by the Construction Representative.

ARTICLE 1.9 - SEPARATE CONTRACTS AND COOPERATION

A. The Owner reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate his work with theirs.

B. The Contractor shall consult the drawings for all other contractors in connection with this work. Any work conflicting with the above shall be brought to the attention of the Owner’s Representative before the work is performed. If the Contractor fails to do this, and constructs any work which interferes with the work of another contractor, the Contractor shall remove any part so conflicting and rebuild same, as directed by the Owner’s Representative at no additional cost to the Owner.

C. Each contractor shall be required to coordinate his work with other contractors so as to afford others reasonable opportunity for execution of their work. No contractor shall delay any other contractor by neglecting to perform contract work at the proper time. If any contractor causes delay to another, they shall be liable directly to that contractor for such delay in addition to any liquidated damages which might be due the Owner.

D. Should the Contractor or project associated subcontractors refuse to cooperate with the instructions and reasonable requests of other Contractors or other subcontractors in the overall coordinating of the work, the Owner may take such appropriate action and issue directions, as required, to avoid unnecessary and unwarranted delays.

E. Each Contractor shall be responsible for damage done to Owner's or other Contractor's property by him/her or workers in his employ through their fault or negligence.

F. Should a Contractor sustain any damage through any act or omission of any other Contractor having a contract with the Owner, the Contractor so damaged shall have no claim or cause of action against the Owner for such damage, but shall have a claim or cause of action against the other Contractor to recover any and all damages sustained by reason of the acts or omissions of such Contractor. The phrase "acts or omissions" as used in this section shall be defined to include, but

not be limited to, any unreasonable delay on the part of any such contractors.

ARTICLE 1.10 - ASSIGNMENT OF CONTRACT

A. No assignment by Contractor of any amount or any part of this contract or of the funds to be received there under will be recognized unless such assignment has had the written approval of the Director and the surety has been given due notice of such assignment and has furnished written consent thereto. In addition to the usual recitals in assignment contracts, the following language must be set forth: "It is agreed that the funds to be paid to the assignee under this assignment are subject to performance by the Contractor of this contract and to claims or liens for services rendered or materials supplied for the performance of the work called for in said contract in favor of all persons, firms or corporations rendering such services or supplying such materials."

ARTICLE 1.11 - INDEMNIFICATION

A. Contractor agrees to indemnify and save harmless Owner and its respective commissioners, officers, officials, agents, consultants and employees and Designer, their agents, servants and employees, from and against any and all liability for damage arising from injuries to persons or damage to property occasioned by any acts or omissions of Contractor, any subcontractors, agents, servants or employees, including any and all expense, legal or otherwise, which may be incurred by Owner or Designer, its agents, servants or employees, in defense of any claim, action or suit.

B. The obligations of the Contractor under this paragraph shall not extend to the liability of the Designer, his agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, contract changes, design or specifications, or (2) giving of or the failure to give directions or instructions by the Designer, his agents or employees as required by this contract documents provided such giving or failure to give is the primary cause of the injury or damage.

ARTICLE 1.12 - DISPUTES AND DISAGREEMENTS

It is hereby expressly agreed and understood that in case any controversy or difference of opinion arises during construction, best efforts will be given to resolution at the field level. Should those efforts be unsuccessful, the Contractor has the right to appeal in writing, the decision of the Director's Designee to the Director at Room 730 Truman Building, P.O. Box 809, Jefferson City, Missouri 65102. The decision of the Director shall be final and binding on all parties.

ARTICLE 2 -- OWNER/DESIGNER RESPONSIBILITIES

A. The Owner shall give all orders and directions contemplated under this contract relative to the execution of the work. During progress of work the Owner will be represented at the project site by the Construction Representative and/or Designer, whose responsibilities are to see that this contract is properly fulfilled.

B. The Owner shall at all times have access to the work whenever it is in preparation or progress. The Contractors shall provide proper facilities for such access and for inspection and supervision.

C. All materials and workmanship used in the work shall be subject to the inspection of the Designer and Construction Representative, and any work which is deemed defective shall be removed, rebuilt or made good immediately upon notice. The cost of such correction shall be borne by the Contractor. Contractor shall not be entitled to an extension of the contract completion date in order to remedy defective work. All rejected materials shall be immediately removed from the site of the work.

D. If the Contractor fails to proceed at once with the correction of rejected defective materials or workmanship, the Owner may, by separate contract or otherwise, have the defects remedied or rejected. Materials removed from the site and charge the cost of the same against any monies which may be due the Contractor, without prejudice to any other rights or remedies of the Owner.

E. Failure or neglect on the part of Owner to observe faulty work, or work done which is not in accordance with the drawings and specifications shall not relieve the Contractor from responsibility for correcting such work without additional compensation.

F. The Owner shall have the right to direct the Contractor to uncover any completed work.

1. If the Contractor fails to adequately notify the Construction Representative and/or Designer of an inspection as required by the Contract Documents, the Contractor shall, upon written request, uncover the work. The Contractor shall bear all costs associated with uncovering and again covering the work exposed.

2. If the Contractor is directed to uncover work, which was not otherwise required by the Contract Documents to be inspected, and the work is found to be defective in any respect, no compensation shall be allowed for this work. If, however, such work is found to meet

the requirements of this contract, the actual cost of labor and material necessarily involved in the examination and replacement plus 10% shall be allowed the Contractor.

G. The Designer shall give all orders and directions contemplated under this contract relative to the scope of the work and shall give the initial interpretation of the contract documents.

H. The Owner may file a written notice to the Contractor to dismiss immediately any subcontractors, project managers, superintendents, foremen, workers, watchmen or other employees whom the Owner may deem incompetent, careless or a hindrance to proper or timely execution of the work. The Contractor shall comply with such notice as promptly as practicable without detriment to the work or its progress.

I. If in the Owner's judgment it becomes necessary at any time to accelerate work, when ordered by the Owner in writing, the Contractor shall redirect resources to such work items and execute such portions of the work as may be required to complete the work within the current approved contract schedule.

ARTICLE 3 -- CONTRACTOR RESPONSIBILITIES

The Contractor shall register and utilize the Owner's eBuilder digital project management system for submission of documents described in the following sections. This includes but is not limited to submittals as required by designer, payment applications, Request for Information (RFI), construction change orders, Request for Proposals (RFP), Designer Supplemental Instructions (DSI), etc.

ARTICLE 3.1 -- ACCEPTABLE SUBSTITUTIONS

A. The Contractor may request use of any article, device, product, material, fixture, form or type of construction which in the judgment of the Owner and Designer is equal in all respects to that named. Standard products of manufacturers other than those specified will be accepted when, prior to the ordering or use thereof, it is proven to the satisfaction of the Owner and Designer that they are equal in design, strength, durability, usefulness and convenience for the purpose intended.

B. Any changes required in the details and dimensions indicated on the drawings for the substitution of products other than those specified shall be properly made at the expense of the Contractor requesting the substitution or change.

C. The Contractor shall submit a request for such substitutions in writing to the Owner and Designer within twenty (20) working days after the date of the "Notice to Proceed." Thereafter no consideration will be given to alternate forms of accomplishing the work. This Article does not preclude the Owner from exercising the provisions of Article 4 hereof.

D. Any request for substitution by the Contractor shall be submitted in accordance with SECTION 002113 - INSTRUCTIONS TO BIDDERS.

E. When a material has been approved, no change in brand or make will be permitted unless:

1. Written verification is received from the manufacturer stating they cannot make delivery on the date previously agreed, or
2. Material delivered fails to comply with contract requirements.

ARTICLE 3.2 -- SUBMITTALS

A. The Contractor's submittals must be submitted with such promptness as to allow for review and approval so as not to cause delay in the work. The Contractor shall coordinate preparation and processing of submittals with performance of construction activities.

Coordinate each submittal with fabrication, = purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

Submit four (4) copies to the Designer and additional copies as required for the subcontractors and material suppliers. Also provide copies to meet the requirements for maintenance manuals.

B. All subcontractors' shop drawings and schedules shall be submitted by the Contractor and shall bear evidence that Contractor has received, reviewed, and approved them. Any shop drawings and schedules submitted without this evidence will be returned to the Contractor for resubmission.

C. The Contractor shall include with the shop drawing, a letter indicating any and all deviations from the drawings and/or specifications. Failure to notify the Designer of such deviations will be grounds for subsequent rejection of the related work or materials. If, in the opinion of the Designer, the deviations are not acceptable, the Contractor will be required to furnish the item as specified and indicated on the drawings.

D. The Designer shall check shop drawings and schedules with reasonable promptness and approve them only if they conform to the design concept of the project and comply with the information given in the contract documents. The approval shall not relieve the Contractor from the responsibility to comply with the drawings and specifications, unless the Contractor has called the Designer's attention to the deviation, in writing, at the time of

submission and the Designer has knowingly approved thereof. An approval of any such modification will be given only under the following conditions:

1. It is in the best interest of the Owner
2. It does not increase the contract sum and/or completion time
3. It does not deviate from the design intent
4. It is without prejudice to any and all rights under the surety bond.

E. No extension of time will be granted because of the Contractor's failure to submit shop drawings and schedules in ample time to allow for review, possible resubmission, and approval. Fabrication of work shall not commence until the Contractor has received approval. The Contractor shall furnish prints of approved shop drawings and schedules to all subcontractors whose work is in any way related to the work under this contract. Only prints bearing this approval will be allowed on the site of construction

F. The Contractor shall maintain a complete file on-site of approved shop drawings available for use by the Construction Representative.

ARTICLE 3.3 – AS-BUILT DRAWINGS

A. The Contractor shall update a complete set of the construction drawings, shop drawings and schedules of all work monthly by marking changes, and at the completion of their work (prior to submission of request for final payment) note all changes and turn the set over to the Construction Representative. The updates shall show all addenda, all field changes that were made to adapt to field conditions, changes resulting from contract changes or supplemental instructions, and all locations of structures, buried installations of piping, conduit, and utility services. All buried and concealed items both inside and outside shall be accurately located as to depth and referenced to permanent features such as interior or exterior wall faces and dimensions shall be given in a neat and legible manner in a contrasting colored pencil or ink. If approved by the Designer, an electronic file format may be provided.

ARTICLE 3.4 – GUARANTY AND WARRANTIES

A. General Guaranty

1. Neither the final certificate of payment nor any provision in the contract documents nor partial use or occupancy of the premises by the Owner shall constitute an acceptance of work not done in accordance with contract requirements.
2. The Contractor or surety shall remedy any defects in the work and pay for any damage to property resulting there from which shall appear within a period of one (1) year from the date of substantial completion unless a longer period is otherwise specified or a differing guaranty period has been established in the substantial completion certificate. The Owner will give notice of observed defects with reasonable promptness.
3. In case of default on the part of the Contractor in fulfilling this part of this contract, the Owner may correct the work or repair the damage and the cost and expense incurred in such event shall be paid by or recoverable from the Contractor or surety.
4. The work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's guaranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment

B. Extended Warranty

Manufacturer's certificates of warranty shall be obtained for all major equipment. Warranty shall be obtained for at least one year. Where a longer period is offered at no additional cost or called for in the specific equipment specifications, the longer period shall govern.

ARTICLE 3.5 -- OPERATION AND MAINTENANCE MANUALS

A. Immediately after equipment submittals are approved and no later than ten (10) working days prior to the substantial completion inspection, the Contractor shall provide to the Designer three (3) copies of operating instructions and service manuals, containing the following:

1. Start-up and Shut-down Procedures: Provide a step-by-step write up of all major equipment. When manufacturer’s printed start-up, trouble shooting and shut-down procedures are available; they may be incorporated into the operating manual for reference.

2. Operating Instructions: Written operating instructions shall be included for the efficient and safe operation of all equipment.

3. Equipment List: List of all major equipment as installed shall be prepared to include model number, capacities, flow rate, name place data, shop drawings and air and water balance reports.

4. Service Instructions: Provide the following information for all pieces of equipment.

   a. Recommended spare parts including catalog number and name of local supplier or factory representative.

   b. Belt sizes, types, and lengths.

   c. Wiring diagrams.

5. Manufacturer's Certificate of Warranty as described in Article 3.4.

6. Prior to the final payment, furnish to the Designer three (4) copies of parts catalogs for each piece of equipment furnished by him/her on the project with the components identified by number for replacement ordering.

B. Submission of operating instructions shall be done in the following manner.

1. Manuals shall be in quadruplicate, and all materials shall be bound into volumes of standard 8½" x 11" hard binders. Large drawings too bulky to be folded into 8½" x 11" shall be separately bound or folded and in envelopes, cross referenced and indexed with the manuals.

2. The manuals shall identify project name, project number, and include the name and address of the Contractor, subcontractors and manufacturers who were involved with the activity described in that particular manual.

3. Internally subdivide the binder contents with permanent page dividers, logically organized with tab titles clearly printed under reinforced laminated plastic tabs.

4. Contents: Prepare a Table of Contents for each volume, with each product or system description identified.

ARTICLE 3.6 – OTHER CONTRACTOR RESPONSIBILITIES

A. The Contractor shall keep on site, during progress of the work, a competent superintendent satisfactory to the Construction Representative. The superintendent shall represent the Contractor and all agreements made by the superintendent shall be binding. The superintendent shall carefully study and compare all drawings, specifications and other instructions and shall promptly notify the Construction Representative and Designer, in writing, any error, inconsistency or omission which may be discovered. The superintendent shall coordinate all work on the project. Any change of the superintendent shall be approved by the Construction Representative.

B. Contractor shall, at all times, enforce strict discipline and good order among his employees, and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him/her.

C. The Contractor shall supply sufficient labor, material, plant and equipment and pay when due any laborer, subcontractor or supplier for supplies furnished and otherwise prosecute the work with diligence to prevent work stoppage and ensure completion thereof within the time specified.

D. The Contractor and each of his subcontractors shall submit to the Construction Representative, through the Designer such schedules of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this contract.

E. The Contractor, subcontractors, and material suppliers shall upon written request, give the Owner access to all time cards, material invoices, payrolls, estimates, profit and loss statements, and all other direct or indirect costs related to this work.

F. The Contractor shall be responsible for laying out all contract work such as layout of architectural, structural, mechanical and electrical work, which shall be coordinated with layouts of subcontractors for general construction work. The Contractor is also responsible for unloading, uncrating and handling of all materials and equipment to be erected or placed by him/her, whether furnished by Contractor or others. No extra charges or compensation will be allowed as a result of failure to verify dimensions before ordering materials or fabricating items.

G. The Contractor must notify the Construction Representative at least one working day before placing concrete or burying underground utilities, pipelines, etc.

H. Contractors shall prearrange time with the Construction Representative for the interruption of any facility operation. Unless otherwise specified in these documents, all connections, alterations or relocations as well as all other portions of the work will be performed during normal working hours.

I. The Contractor shall coordinate all work so there will not be prolonged interruptions of existing equipment operation. Any existing plumbing, heating, ventilating, air conditioning or electrical disconnections necessary for the project, which affect portions of this construction or building or any other building must be scheduled with the Construction Representative to minimize or avoid any disruption of facility operations. In no case, unless previously approved in writing by the Construction Representative, shall utilities be left disconnected at the end of a work day or over a weekend. Any interruption of utilities either intentionally or accidentally shall not relieve the Contractor responsible for the interruption from the responsibility to repair and restore the utility to normal service. Repairs and restoration shall be made before the workers responsible for the repair and restoration leave the job.

J. Contractors shall limit operations and storage of materials to the area within the project, except as necessary to connect to existing utilities, and shall not encroach on neighboring property. The Contractor shall be responsible for repair of their damage to property on or off the project site occurring during construction of project. All such repairs shall be made to the satisfaction of the property owner.

K. Unless otherwise permitted, all materials shall be new and both workmanship and materials shall be of the best quality.

L. Unless otherwise provided and stipulated within these specifications, the Contractor shall furnish, construct, and/or install and pay for materials, devices, mechanisms, equipment, all necessary personnel, utilities including, but not limited to water, heat, light and electric power, transportation services, applicable taxes of every nature, and all other facilities necessary for the proper execution and completion of the work.

M. Contractor shall carefully examine the plans and drawings and shall be responsible for the proper fitting of his material, equipment and apparatus into the building.

N. The Contractor or subcontractors shall not overload, or permit others to overload, any part of any structure during the performance of this contract.

O. All temporary shoring, bracing, etc., required for the removal of existing work and/or for the installation of new work shall be included in this contract. The Contractor shall make good, at no cost to the Owner, any damage caused by improper support or failure of shoring in any respect. Each Contractor shall be responsible for shoring required to protect his work or adjacent property and improvements of Owner and shall be responsible for shoring or for giving written notice to adjacent property owners. Shoring shall be removed only after completion of permanent supports.

P. The Contractor shall provide at the proper time such material as is required for support of the work. If openings are required, whether shown on drawings or not, the Contractor shall see that they are properly constructed.

Q. During the performance of work the Contractor shall be responsible for providing and maintaining warning signs, lights, signal devices, barricades, guard rails, fences and other devices appropriately located on site which will give proper and understandable warning to all persons of danger of entry onto land, structure or equipment.

R. The Contractor shall be responsible for protection, including weather protection, and proper maintenance of all equipment and materials.

S. The Contractor shall be responsible for care of the finished work and shall protect same from damage or defacement until substantial completion by the Owner. If the work is damaged by any cause, the Contractor shall immediately begin to make repairs in accordance with the drawings and specifications. Contractor shall be liable for all damage or loss unless attributable to the acts or omissions of the Owner or Designer. Any claim for reimbursement shall be submitted in accordance with Article 4. After substantial completion the Contractor will only be responsible for damage resulting from acts or omissions of the Contractor or subcontractors through final warranty.

T. In the event the Contractor encounters an unforeseen hazardous material, the Contractor shall immediately stop work in the area affected and report the condition to the Owner and Designer in writing. The Contractor shall not be required, pursuant to Article 4, to perform, any work relating to hazardous materials.

U. In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 4.

V. Before commencing work, Contractors shall confer with the Construction Representative and facility representative and review any facility rules and regulations which may affect the conduct of the work.

W. Project signs will only be erected on major projects and only as described in the specifications. If no sign is specified, none shall be erected.

ARTICLE 3.7 -- SUBCONTRACTS

A. Subcontractor assignments as identified in the bid form shall not be changed without written approval of the Owner. The Owner will not approve changes of a listed subcontractor unless the Contractor documents, to the satisfaction of the Owner that the subcontractor cannot or will not perform the work as specified.

B. The Contractor is fully responsible to the Owner for the acts and omissions of all subcontractors and of persons either directly or indirectly employed by them.

C. Every subcontractor shall be bound by the applicable terms and provisions of these contract documents, but no contractual relationship shall exist between any subcontractor and the Owner unless the right of the Contractor to proceed with the work is suspended or this contract is terminated as herein provided, and the Owner in writing elects to assume the subcontract.

D. The Contractor shall upon receipt of "Notice to Proceed" and prior to submission of the first payment request, notify the Designer and Construction Representative in writing of the names of any subcontractors to be used in addition to those identified in the bid form and all major material suppliers proposed for all parts of the work.

ARTICLE 4 -- CHANGES IN THE WORK

4.1 CHANGES IN THE WORK

A. The Construction Representative, without giving notice to the surety and without invalidating this contract, may order extra work or make changes by altering, adding to or deducting from the work, this contract sum being adjusted accordingly. All such work shall be executed under the conditions of the original contract. A claim for extension of time caused by any change must be adjusted at the time of ordering such change. No future request for time will be considered.

B. Each Contract Change shall include all costs required to perform the work including all labor, material, equipment, overheads and profit, delay, disruptions, or other miscellaneous expenses. No subsequent requests for additional compensation including claims for delay, disruption, or reduced efficiency as a result of each change will be considered. Values from the Schedule of Values will not be binding as a basis for additions to or deductions from the contract price.

C. The amount of any adjustment in this contract price for authorized changes shall be agreed upon before such changes become effective and shall be determined, through submission of a request for proposal, as follows:

1. By an acceptable fixed price proposal from the Contractor. Breakdowns shall include all takeoff sheets of each Contractor and subcontractor. Breakdown shall include a listing of each item of material with unit prices and number of hours of labor for each task. Labor costs per hour shall be included with labor burden identified, which shall be not less than the prevailing wage rate, etc. Overhead and profit shall be shown separately for each subcontractor and the Contractor.

2. By a cost-plus-fixed-fee (time and material) basis with maximum price, total cost not to exceed said maximum. Breakdown shall include a listing of each item of material with unit prices and number of hours of labor for each task. Labor costs per hour shall be included with labor burden identified, which shall be not less than the prevailing wage rate, etc. Overhead and profit shall be shown separately for each subcontractor and the Contractor.

3. By unit prices contained in Contractor's original bid form and incorporated in the construction contract.

D. Overhead and Profit on Contract Changes shall be applied as follows:

1. The overhead and profit charge by the Contractor and all subcontractors shall be considered to include, but is not limited to: incidental job burdens, small truck (under 1 ton) expense, mileage, small hand tools, warranty costs, company benefits and general office overhead. Project supervision including field supervision and job site office expense shall be considered a part of overhead and profit unless a compensable time extension is granted.

2. The percentages for overhead and profit charged on Contract Changes shall be subject to the following limits: (a) the percentage mark-up for the Contractor shall be limited to the Contractor’s fee: (b) fifteen percent (15%) maximum for Work directly performed by employees of a subcontractor, or sub-subcontractor; (c) five percent (5%) maximum for the Work performed or passed through to the Owner by the Contractor; (d) five percent (5%) maximum subcontractor’s mark-up for

Work performed by a sub-subcontractor and passed through to the Owner by the subcontractor and Contractor; and (e) in no case shall the total overhead and profit paid by the Owner on any Contract Changes exceed twenty-five percent (25%) of the cost of materials, labor and equipment (exclusive of Contractor or any Subcontractor overhead and profit) necessary to put the contract change work in place.

3. The Contractor will be allowed to add the cost of Contractor's payment and performance bonding, builder's risk insurance, and general liability insurance to their cost of work. The above listed bonding and insurance cost shall not exceed two percent (2%) and shall be allowed on the total cost of the added work, including overhead and profit.

4. On proposals covering both increases and decreases in the amount of this contract, the application of overhead and profit shall be on the net change in the cost of the work.

5. The percentage(s) for overhead and profit to be credited to the Owner on Contract Changes that are solely decreases in the quantity of work or materials shall be the same as those for additive Contract Changes provided above.

E. No claim for an addition to this contract sum shall be valid unless authorized as aforesaid in writing by the Owner. In the event that none of the foregoing methods are agreed upon, the Owner may order the Contractor to perform work on a time and material basis. The cost of such work shall be determined by the Contractor's actual labor and material cost to perform the work plus overhead and profit as outlined herein. The Designer and Construction Representative shall approve the Contractor's daily time and material invoices for the work involved.

F. If the Contractor claims that any instructions involve extra cost under this contract, the Contractor shall give the Owner's Representative written notice thereof within a reasonable time after the receipt of such instructions, and in any event before proceeding to execute the work. No such claim shall be valid unless so made and authorized by the Owner, in writing.

G. In an emergency affecting the safety of life or of the structure or of adjoining property, the Contractor, without special instruction or authorization from the Construction Representative, is hereby permitted to act at their discretion to prevent such threatened loss or injury. The Contractor shall submit a claim for compensation for such emergency work in writing to the Owner's Representative.

ARTICLE 4.2 – CHANGES IN COMPLETION TIME

A. Extension of the number of work days stipulated in the Contract for completion of the work with compensation may be made when:

1. The contractor documents that proposed Changes in the work, as provided in Article 4.1, extends construction activities critical to contract completion date, OR

2. The Owner suspends all work for convenience of the Owner as provided in Article 7.3, OR

3. An Owner caused delay extends construction activities critical to contract completion (except as provided elsewhere in these General Conditions). The Contractor is to review the work activities yet to begin and evaluate the possibility of rescheduling the work to minimize the overall project delay.

B. Extension of the number of work days stipulated in the Contract for completion of the work <u>without</u> compensation may be made when:

1. Weather-related delays occur, subject to provisions for the inclusion of a specified number of "bad weather" days when provided for in Section 012100-Allowances, OR

2. Labor strikes or acts of God occur, OR

3. The work of the Contractor is delayed on account of conditions which were beyond the control of the Contractor, subcontractors or suppliers, and were not the result of their fault or negligence.

C. No time extension or compensation will be provided for delays caused by or within the control of the Contractor, subcontractors or suppliers and for concurrent delays caused by the Owner.

D. The Contractor shall notify the Owner promptly of any occurrence or conditions which in the Contractor's opinion results in a need for an extension of time. The notice shall be in writing and shall include all necessary supporting materials with details of any resultant costs and be submitted in time to permit full investigation and evaluation of the Contractor's claim. The Owner shall promptly acknowledge the Contractor's notice and, after recommendation from the Owner's Representative and/or Designer, shall provide a decision to the Contractor. Failure on the part of the Contractor to provide such notice and to detail the costs shall constitute a waiver by the Contractor of any claim. Requests for extensions of time shall be for working days only.

ARTICLE 5 - CONSTRUCTION AND COMPLETION

ARTICLE 5.1 – CONSTRUCTION COMMENCEMENT

A. Upon receipt of the "Intent to Award" letter, the Contractor must submit the following properly executed instruments to the Owner:

1. Contract;
2. Performance/payment bond as described in Article 6.1;
3. Certificates of Insurance, or the actual policies themselves, showing that the Contractor has obtained the insurance coverage required by Article 6.2.

Above referenced items must be received by the Owner within ten (10) working days after the effective date of the contract. If not received, the Owner may treat the failure to timely submit them as a refusal by the Contractor to accept a contract for this work and may retain as liquidated damages the Contractor's bid bond, cashier's check or certified check as provided in the Instructions to Bidders. Upon receipt the Owner will issue a "Notice to Proceed" with the work to the Contractor.

B. Within the time frame noted in Section 013200 - Schedules, following receipt of the "Notice to Proceed", the Contractor shall submit to the Owner a progress schedule and schedule of values, showing activities through the end of the contract period. Should the Contractor not receive written notification from the Owner of the disapproval of the schedule of values within fifteen (15) working days, the Contractor may consider it approved for purpose of determining when the first monthly Application and Certification for Payment may be submitted.

C. The Contractor may commence work upon receipt of the Division of Facilities Management, Design and Construction's "Notice to Proceed" letter. Contractor shall prosecute the work with faithfulness and energy, and shall complete the entire work on or before the completion time stated in the contract documents or pay to the Owner the damages resulting from the failure to timely complete the work as set out within Article 5.4.

ARTICLE 5.2 -- PROJECT CONSTRUCTION

A. Each Contractor shall submit for the Owner's approval, in reproducible form, a progress schedule showing the rate of progress and the order of the work proposed to carry on various phases of the project. The schedule shall be in conformance with the requirements outlined in Section 013200 – Schedules.

B. Contractor shall employ and supply a sufficient force of workers, material, and equipment and shall pay when due, any worker, subcontractor or supplier and otherwise prosecute the work with such diligence so as to maintain the rate of progress indicated on the progress schedule, prevent work stoppage, and insure completion of the project within the time specified.

ARTICLE 5.3 -- PROJECT COMPLETION

A. Substantial Completion. A Project is substantially complete when construction is essentially complete and work items remaining to be completed can be done without interfering with the Owner's ability to use the Project for its intended purpose.

1. Once the Contractor has reached what they believe is Substantial Completion, the Contractor shall notify the Designer and the Construction Representative of the following:
   a. That work is essentially complete with the exception of certain listed work items. The list shall be referred to as the "Contractor's Punch."
   b. That all Operation and Maintenance Manuals have been assembled and submitted in accordance with Article 3.5A.
   c. That the Work is ready for inspection by the Designer and Construction Representative. The Owner shall be entitled to a minimum of ten working days notice before the inspection shall be performed.
2. If the work is acceptable, the Owner shall issue a Certificate of Substantial Completion, which shall set forth the responsibilities of the Owner and the Contractor for utilities, security, maintenance, damage to the work and risk of loss. The Certificate shall also identify those remaining items of work to be performed by the Contractor. All such work items shall be complete within 30 working days of the date of the Certificate, unless the Certificate specifies a different time. If the Contractor shall be required to perform tests that must be delayed due to climatic conditions, it is understood that such tests and affected equipment will be identified on the Certificate and shall be accomplished by the Contractor at the earliest possible date. Performance of the tests may not be required before Substantial Completion can be issued. The date of the issuance of the Certificate of

Substantial Completion shall determine whether or not the work was completed within the contract time and whether or not Liquidated Damages are due.

3. If the work is not acceptable, and the Owner does not issue a Certificate of Substantial Completion, the Owner shall be entitled to charge the Contractor with the Designer's and Owner's costs of re-inspection, including time and travel.

B. Partial Occupancy. Contractor agrees that the Owner shall be permitted to occupy and use any completed or partially completed portions of the Project, when such occupancy and use is in the Owner's best interest. Owner shall notify Contractor of its desire and intention to take Partial Occupancy as soon as possible but at least ten (10) working days before the Owner intends to occupy. If the Contractor believes that the portion of the work the Owner intends to occupy is not ready for occupancy, the Contractor shall notify the Owner immediately. The Designer shall inspect the work in accordance with the procedures above. If the Contractor claims increased cost of the project or delay in completion as a result of the occupancy, he shall notify the Owner immediately but in all cases before occupancy occurs.

C. Final Completion. The Project is finally complete when the Certificate of Substantial Completion has been issued and all work items identified therein as incomplete have been completed, and when all administrative items required by the contract have been completed. Final Completion entitles the Contractor to payment of the outstanding balance of the contract amount including all change orders and retainage. Within five (5) working days of the date of the Certificate of Substantial Completion, the Contractor shall identify the cost to complete any outstanding items of work. The Designer shall review the Contractor's estimate and either approve it or provide an independent estimate for all such items. If the Contractor fails to complete the remaining items within the time specified in the Certificate, the Owner may terminate the contract and go to the surety for project completion in accordance with Article 7.2 or release the contract balance to the Contractor less 150% of the approved estimate to complete the outstanding items. Upon completion of the outstanding items, when a final cost has been established, any monies remaining shall be paid to the Contractor. Failure to complete items of work does not relieve the Contractor from the obligation to complete the administrative requirements of the contract, such as the provisions of Article 5.3 FAILURE TO COMPLETE ALL ITEMS OF WORK UNDER THE CONTRACT SHALL BE CONSIDERED A DEFAULT AND BE GROUNDS FOR CONTRACT TERMINATION AND DEBARMENT.

D. Liquidated Damages. Contractor agrees that the Owner may deduct from the contract price and retain as liquidated damages, and not as penalty or forfeiture, the sum stipulated in this contract for each work day after the Contract Completion Day on which work is not Substantially Complete. Assessment of Liquidated Damages shall not relieve the Contractor or the surety of any responsibility or obligation under the Contract. In addition, the Owner may, without prejudice to any other rights, claims, or remedies the Owner may have including the right to Liquidated Damages, charge the Contractor for all additional expenses incurred by the Owner and/or Designer as the result of the extended contract period through Final Completion. Additional Expenses shall include but not be limited to the costs of additional inspections.

E. Early Completion. The Contractor has the right to finish the work before the contract completion date; however, the Owner assumes no liability for any hindrances to the Contractor unless Owner caused delays result in a time extension to the contract completion date. The Contractor shall not be entitled to any claims for lost efficiencies or for delay if a Certificate of Substantial Completion is given on or before the Contract Completion Date.

ARTICLE 5.4 -- PAYMENT TO CONTRACTOR

A. Payments on account of this contract will be made monthly in proportion to the work which has been completed. Request for payment must be submitted on the Owner's forms. No other pay request will be processed. Supporting breakdowns must be in the same format as Owner's forms and must provide the same level of detail. The Designer will, within 5 working days from receipt of the contractor's request for payment either issue a Certificate for Payment to the Owner, for such amount as the Designer determines is properly due, or notify the Contractor in writing of reasons for withholding a Certificate. The Owner shall make payment within 30 calendar days after the "Application and Certification for Payment" has been received and certified by the Designer. The following items are to be attached to the contractor's pay request:

1. Updated construction schedule
2. Certified payrolls consisting of name, occupation and craft, number of hours worked and actual wages paid for each individual employee, of the Contractor and all subcontractors working on the project

B. The Owner shall retain 5 percent of the amount of each such payment application, except as allowed by Article 5.4, until final completion and acceptance of all work covered by this contract.

C. Each payment made to Contractor shall be on account of the total amount payable to Contractor and all material and work covered by paid partial payment shall thereupon become the sole property of Owner. This provision shall not be construed as relieving Contractor from sole responsibility for care and protection of materials and work upon which payments have been made or restoration of any damaged work or as a waiver of the right of Owner to require fulfillment of all terms of this contract.

D. Materials delivered to the work site and not incorporated in the work will be allowed in the Application and Certification for Payment on the basis of one hundred (100%) percent of value, subject to the 5% retainage providing that they are suitably stored on the site or in an approved warehouse in accordance with the following requirements:

1. Material has previously been approved through submittal and acceptance of shop drawings conforming to requirements of Article 3.2 of General Conditions.

2. Delivery is made in accordance with the time frame on the approved schedule.

3. Materials, equipment, etc., are properly stored and protected from damage and deterioration and remain so - if not, previously approved amounts will be deleted from subsequent pay applications.

4. The payment request is accompanied by a breakdown identifying the material equipment, etc. in sufficient detail to establish quantity and value.

E. The Contractor shall be allowed to include in the Application and Certification for Payment, one hundred (100%) of the value, subject to retainage, of major equipment and material stored off the site if all of the following conditions are met:

1. The request for consideration of payment for materials stored off site is made at least 15 working days prior to submittal of the Application for Payment including such material. Only materials inspected will be considered for inclusion on Application for Payment requests.

2. Materials stored in one location off site are valued in excess of $25,000.

3. That a Certificate of Insurance is provided indicating adequate protection from loss, theft conversion or damage for materials stored off site. This Certificate shall show the State of Missouri as an additional insured for this loss.

4. The materials are stored in a facility approved and inspected, by the Construction Representative.

5. Contractor shall be responsible for, Owner costs to inspect out of state facilities, and any delays in the completion of the work caused by damage to the material or for any other failure of the Contractor to have access to this material for the execution of the work.

F. The Owner shall determine the amount, quality and acceptability of the work and materials which are to be paid for under this contract. In the event any questions shall arise between the parties, relative to this contract or specifications, determination or decision of the Owner or the Construction Representative and the Designer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected in any manner or to any extent by such question.

G. Payments Withheld: The Owner may withhold or nullify in whole or part any certificate to such extent as may be necessary to protect the Owner from loss on account of:

1. Defective work not remedied. When a notice of noncompliance is issued on an item or items, corrective action shall be undertaken immediately. Until corrective action is completed, no monies will be paid and no additional time will be allowed for the item or items. The cost of corrective action(s) shall be borne by the Contractor.

2. A reasonable doubt that this contract can be completed for the unpaid balance.

3. Failure of the Contractor to update as-built drawings monthly for review by the Construction Representative.

4. Failure of the Contractor to update the construction schedule.

When the Construction Representative is satisfied the Contractor has remedied above deficiencies, payment shall be released.

H. Final Payment: Upon receipt of written notice from the Contractor to the Designer and Project Representative that the work is ready for final inspection and acceptance, the Designer and Project Representative, with the Contractor, shall promptly make such inspection. If the work is acceptable and the contract fully performed, the Construction Representative shall complete a final acceptance report and the Contractor will be

directed to submit a final Application and Certification for Payment. If the Owner approves the same, the entire balance shall be due and payable, with the exception of deductions as provided for under Article 5.4.

1. Where the specifications provide for the performance by the Contractor of (certain tests for the purpose of balancing and checking the air conditioning and heating equipment and the Contractor shall have furnished and installed all such equipment in accordance with the specifications, but said test cannot then be made because of climatic conditions, such test shall may be considered as required under the provisions of the specifications, Section 013300 and this contract may be substantial Full payment will not be made until the tests have been made and the equipment and system is finally accepted. If the tests are not completed when scheduled, the Owner may deduct 150% of the value of the tests from the final payment.
2. The final payment shall not become due until the Contractor delivers to the Construction Representative:

    a) A complete file of releases, on the standard form included in the contract documents as "Final Receipt of Payment and Release Form", from subcontractors and material suppliers evidencing payment in full for services, equipment and materials, as the case may require, if the Owner approves, or a consent from the Surety to final payment accepting liability for any unpaid amounts.

    b) An Affidavit of Compliance with Prevailing Wage Law, in the form as included in this contract specifications, properly executed by each subcontractor, and the Contractor

    c) Certified copies of all payrolls

    d) As-built drawings

3. If any claim remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such a claim including all costs and a reasonable attorney's fee.
4. Missouri statute requires prompt payment from the Owner to the Contractor within thirty calendar days and from the Contractor to his subcontractors within fifteen calendar days. Failure to make payments within the required time frame entitles the receiving party to charge interest at the rate of one and one half percent per month calculated from the expiration of the statutory time period until paid.
5. The value of all unused unit price allowances and/or 150% of the value of the outstanding work items, and/or liquidated damages may be deducted from the final pay request without executing a Contract Change. Any unit price items which exceed the number of units in the contract may be added by Contract Change.

ARTICLE 6 -- INSURANCE AND BONDS

ARTICLE 6.1 -- BOND

A. Contractor shall furnish a performance/payment bond in an amount equal to 100% of the contract price to guarantee faithful performance of the contract and 100% of the contract price to guarantee the payment of all persons performing labor on the project and furnishing materials in connection therewith under this contract as set forth in the standard form of performance and payment bond included in the contract documents. The surety on such bond shall be issued by a surety company authorized by the Missouri Department of Insurance to do business in the state of Missouri.

B. All Performance/Payment Bonds furnished in response to this provision shall be provided by a bonding company with a rating of B+ or higher as established by A.M. Best Company, Inc. in their most recent publication.

ARTICLE 6.2 – INSURANCE

A. The successful Contractor shall procure and maintain for the duration of the contract issued a policy or policies of insurance for the protection of both the Contractor and the Owner and their respective officers, officials, agents, consultants and employees. The Owner requires certification of insurance coverage from the Contractor prior to commencing work.

B. Minimum Scope and Extent of Coverage

1. General Liability

Commercial General Liability, ISO coverage form number or equivalent CG 00 01 ("occurrence" basis), or I-SO coverage form number CG 00 02, or ISO equivalent.

If ISO equivalent or manuscript general liability coverage forms are used, minimum coverage will be as follows: Premises/Operations; Independent Contractors; Products/Completed Operations; personal Injury; Broad Form Property Damage including Completed Operations; Broad Form Contractual Liability Coverage to include Contractor's obligations under Article 1.11 Indemnification and any other Special Hazards required by the work of the contract.

2. Automobile Liability

Business Automobile Liability Insurance, ISO Coverage form number or equivalent CA 00 01 covering automobile liability, code 1 "ANY AUTO".

3. Workers' Compensation and Employer's Liability

Statutory Workers' Compensation Insurance for Missouri and standard Employer's Liability Insurance, or the authorization to self-insure for such liability from the Missouri Division of Workers' Compensation.

4. Builder's Risk or Installation Floater Insurance

Insurance upon the work and all materials, equipment, supplies, temporary structures and similar items which may be incident to the performance of the work and located at or adjacent to the site, against loss or damage from fire and such other casualties as are included in extended coverage in broad "All Risk" form, including coverage for Flood and Earthquake, in an amount not less than the replacement cost of the work or this contact price, whichever is greater, with loss payable to Contractor and Owner as their respective interests may appear.

Contractor shall maintain sufficient insurance to cover the full value of the work and materials as the work progresses, and shall furnish Owner copies of all endorsements. If Builder's Risk Reporting- Form of Endorsement is used, Contractor shall make all reports as required therein so as to keep in force an amount of insurance which will equal the replacement cost of the work, materials, equipment, supplies, temporary structures, and other property covered thereby; and if, as a result of Contractor's failure to make any such report, the amount of insurance so recoverable shall be less than such replacement cost, Contractor's interest in the proceeds of such insurance, if any, shall be subordinated to Owner's interest to the end that Owner may receive full reimbursement for its loss.

C. Minimum Limits of Insurance

1. General Liability

Contractor

$2,000,000	combined single limit per occurrence for bodily injury, personal injury, and property damage
$2,000,000	annual aggregate

2. Automobile Liability

$2,000,000	combined single limit per occurrence for bodily injury and property damage

3. Workers' Compensation and Employers Liability

Workers' Compensation limits as required by applicable State Statutes (generally unlimited) and minimum of $1,000,000 limit per accident for Employer's Liability.

General Liability and Automobile Liability insurance may be arranged under individual policies for the full limits required or by a combination of underlying policies with the balance provided by a form-following Excess or Umbrella Liability policy.

D. Deductibles and Self-Insured Retentions

All deductibles, co-payment clauses, and self-insured retentions must be declared to and approved by the Owner. The Owner reserves the right to request the reduction or elimination of unacceptable deductibles or self-insured retentions, as they would apply to the Owner, and their respective officers, officials, agents, consultants and employees. Alternatively, the Owner may request Contractor to procure a bond guaranteeing

payment of losses and related investigations, claims administration, and defense expenses.

E. Other Insurance Provisions and Requirements

The respective insurance policies and coverage, as specified below, must contain, or be endorsed to contain the following conditions or provisions:

1. General Liability

The Owner, and its respective commissioners, officers, officials, agents, consultants and employees shall be endorsed as additional insured's by ISO form CG 20 26 Additional Insured - Designated Person or Organization. As additional insured's, they shall be covered as to work performed by or on behalf of the Contractor or as to liability which arises out of Contractor's activities or resulting from the performance of services or the delivery of goods called for by the Contract.

Contractor's insurance coverage shall be primary with respect to all additional insured's. Insurance of self-insurance programs maintained by the designated additional -insured's shall be excess of the Contractor's insurance and shall not contribute with it.

Additionally, the Contractor and Contractor's general liability insurer shall agree to waive all rights of subrogation against the Owner and any of their respective officers, officials, agents, consultants or employees for claims, losses, or expenses which arise out of Contractor's activities or result from the performance of services or the delivery of goods called for by the Contract.

Contractor's failure to comply with the terms and conditions of these insurance policies shall not affect or abridge coverage for the Owner, or for any of their officers, officials, agents, consultants or employees.

2. Automobile Insurance

The Owner, and their respective officers, officials, agents, consultants and employees shall be endorsed as additional insured's by ISO form CG 20 26 - Additional Insured Designated Person or Organization. As additional insured's, they shall be covered as to work performed by or on behalf of the Contractor or as to liability which arises out of Contractor's activities or resulting from the performance of services or the delivery of goods called for by the Contract.

Contractor's insurance coverage shall be primary with respect to all additional insured's. Insurance or self-insurance programs maintained by the designated additional insured's shall be in excess of the Contractor's insurance and shall not contribute with it.

Additionally, the Contractor and Contractor's automobile insurer shall agree to waive all rights of subrogation against the Owner and any of their respective officers, officials, agents, consultants or employees for claims, losses, or expenses which arise out of Contractor's activities or result from the performance of services or the delivery of goods called for by the Contract.

Contractor's failure to comply with the terms and conditions of these insurance policies shall not affect or abridge coverage for the Owner or for any of its officers, officials, agents, consultants or employees.

3. Workers' Compensation/Employer's Liability

Contractor's workers' compensation insurance shall be endorsed with NCCI form WC 00 03 01 A - Alternative Employer Endorsement. The Alternative Employer Endorsement shall designate the Owner as "alternate employers."

4. All Coverages

Each insurance policy required by this section of the Contract shall contain a stipulation, endorsed if necessary, that the Owner will receive a minimum of a thirty (30) calendar day advance notice of any policy cancellation. Ten (10) calendar days advance notice is required for policy cancellation due to non-payment of premium.

F. Insurer Qualifications and Acceptability

Insurance required hereunder shall be issued by an A.M. Best, "B+" rated, Class IX insurance company approved to conduct insurance business in the state of Missouri.

G. Verification of Insurance Coverage

Prior to Owner issuing a Notice to Proceed, the Contractor-shall furnish the Owner with Certificate(s) of Insurance and with any applicable original endorsements evidencing the required insurance coverage. The insurance certificates and endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. All certificates and endorsements received by the Owner are subject to review and approval by the Owner. The Owner reserves the right to require certified copies of all required policies at any time. If the scope of this contract will exceed one (1) year - or, if any of Contractor's applicable insurance coverage expires prior to completion of the work or services required under this contract -

the Contractor will provide a renewal or replacement certificate before continuing work or services hereunder. If the Contractor fails to provide documentation of required insurance coverage, the Owner may issue a stop work order and no additional contract completion time and/or compensation shall be granted as a result thereof.

ARTICLE 7 – SUSPENSION OR TERMINATION OF CONTRACT

ARTICLE 7.1 - FOR SITE CONDITIONS

When conditions at the site of the proposed work are considered by the Owner to be unsatisfactory for prosecution of the work, the Contractor may be ordered in writing to suspend the work or any part thereof until reasonable conditions exist. When such suspension is not due to fault or negligence of the Contractor, time allowed for completion of such suspended work will be extended by a period of time equal to that lost due to delay occasioned by ordered suspension. This will be a no cost time extension.

ARTICLE 7.2 - FOR CAUSE

A. Termination or Suspension for Cause:

1. If the Contractor shall file for bankruptcy, or should make a general assignment for the benefit of the creditors, or if a receiver should be appointed on account of insolvency, or if the contractor should persistently or repeatedly refuse or fail to supply enough properly skilled workers or proper materials, or if the contractor should fail to make prompt payment to subcontractors or for material or labor, or persistently disregard laws, ordinances or the instructions of the Owner, or otherwise be guilty of a substantial violation of any provision of this contract, then the Owner may serve notice on the Contractor and the surety setting forth the violations and demanding compliance with this contract. Unless within ten (10) consecutive calendar days after serving such notice, such violations shall cease and satisfactory arrangements for correction be made, the Owner may suspend the Contractor's right to proceed with the work or terminate this contract.

2. In the event the Owner suspends Contractor's right to proceed with the work or terminates the contract, the Owner may demand that the Contractor's surety take over and complete the work on this contract, after the surety submits a written proposal to the Owner and receives written approval and upon the surety's failure or refusal to do so within ten (10) consecutive calendar days after demand therefore, the Owner may take over the work and prosecute the same to completion by bid or negotiated contract, or the Owner may elect to take possession of and utilize in completing the work such materials, supplies, appliances and plant as may be on the site of the work, and all subcontractors, if the Owner elects, shall be bound to perform their contracts.

B. The Contractor and its surety shall be and remain liable to the Owner for any excess cost or damages occasioned to the Owner as a result of the actions above set forth.

C. The Contractor in the event of such suspension or termination shall not be entitled to receive any further payments under this contract until the work is wholly finished. Then if the unpaid balance under this contract shall exceed all expenses of the Owner as certified by the Director, such excess shall be paid to the Contractor; but, if such expenses shall exceed the unpaid balance as certified by the Director, the Contractor and their surety shall be liable for and shall pay the difference and any damages to the Owner.

D. In exercising Owner's right to secure completion of the work under any of the provisions hereof, the Director shall have the right to exercise Owner's sole discretion as to the manner, methods and reasonableness of costs of completing the work.

E. The rights of the Owner to suspend or terminate as herein provided shall be cumulative and not exclusive and shall be in addition to any other remedy provided by law.

F. The Contractor in the event of such suspension or termination may be declared ineligible for Owner contracts for a minimal period of twelve (12) months. Further, no contract will be awarded to any Contractor who lists in their bid form any subcontractor whose prior performance has contributed, as determined by the Owner, to a breach of a contract. In order to be considered for state-awarded contracts after this period, the Contractor/subcontractor will be required to forward acceptance reports to the Owner regarding successful completion of non-state projects during the intervening twelve (12) months from the date of default. No contracts will be awarded to a subcontractor/Contractor until the ability to perform responsibly in the private sector has been proven to the Owner.

ARTICLE 7.3 -- FOR CONVENIENCE

A. The Owner may terminate or suspend the Contract or any portion of the Work without cause at any time, and at the Owner's convenience. Notification of a termination or suspension shall be in writing

and shall be given to the Contractor and their surety. If the Contract is suspended, the notice will contain the anticipated duration of the suspension or the conditions under which work will be permitted to resume. If appropriate, the Contractor will be requested to demobilize and re-mobilize and will be reimbursed time and costs associated with the suspension.

B. Upon receipt of notification, the Contractor shall:

1. Cease operations when directed.

2. Take actions to protect the work and any stored materials.

3. Place no further subcontracts or orders for material, supplies, services or facilities except as may be necessary to complete the portion of the Contract that has not been terminated. No claim for payment of materials or supplies ordered after the termination date shall be considered.

4. Terminate all existing subcontracts, rentals, material, and equipment orders.

5. Settle all outstanding liabilities arising from termination with subcontractors and suppliers.

6. Transfer title and deliver to the Owner, work in progress, completed work, supplies and other material produced or acquire for the work terminated, and completed or partially completed plans, drawings information and other property that, if the Contract had been completed, would be required to be furnished to the Owner.

C. For termination without cause and at the Owner's convenience, in addition to payment for work completed prior to date of termination, the Contractor may be entitled to payment of other documented costs directly associated with the early termination of the contract. Payment for anticipated profit and unapplied overhead will not be allowed.

SECTION 007300 - SUPPLEMENTARY CONDITIONS

1.0 GENERAL:

A. These Supplementary General Conditions clarify, add, delete, or otherwise modify standard terms and conditions of DIVISION 0, BIDDING AND CONTRACTING REQUIREMENTS.

2.0 CONTACTS:

Designer:
Jeff Bartley
Waters Edge Aquatic Design
1153 Southwest Blvd., Ste. 202
Kansas City, KS 66103
Telephone: (91) 438-4338
Email: jbartley@wedesignpools.com

Construction Representative:
Robert Rehagen
Division of Facilities Management, Design and Construction
301 West High Street, Room 730
Jefferson City, MO 65101
Telephone: (573) 616-6307
Email: robert.rehagen@oa.mo.gov

Project Manager:
Andrew Friedmeyer
Division of Facilities Management, Design and Construction
301 West High Street, Room 730
Jefferson City, Missouri 65101
Telephone: (573) 536-8019
Email: andrew.friedmeyer@oa.mo.gov

Contract Specialist:
Paul Girouard
Division of Facilities Management, Design and Construction
301 West High Street, Room 730
Jefferson City, Missouri 65101
Telephone: (573) 751-4797
Email: paul.girouard@oa.mo.gov

3.0 NOTICE: ALL BID MATERIALS ARE DUE AT THE TIME OF BID SUBMITTAL. THERE IS NO SECOND SUBMITTAL FOR THIS PROJECT.

4.0 FURNISHING CONSTRUCTION DOCUMENTS:

A. The Owner will furnish the Contractor with approximately 4 complete sets of drawings and specifications at no charge.

B. The Owner will furnish the Contractor with approximately 4 sets of explanatory or change drawings at no charge.

C. The Contractor may make copies of the documents as needed with no additional cost to the Owner.

5.0 SAFETY REQUIREMENTS

Contractor and subcontractors at any tier shall comply with RSMo 292.675 and Article 1.3, E, of Section 007213, General Conditions.

Missouri
Division of Labor Standards
WAGE AND HOUR SECTION

MICHAEL L. PARSON, Governor

Annual Wage Order No. 31

Section 026
COLE COUNTY

In accordance with Section 290.262 RSMo 2000, within thirty (30) days after a certified copy of this Annual Wage Order has been filed with the Secretary of State as indicated below, any person who may be affected by this Annual Wage Order may object by filing an objection in triplicate with the Labor and Industrial Relations Commission, P.O. Box 599, Jefferson City, MO 65102-0599. Such objections must set forth in writing the specific grounds of objection. Each objection shall certify that a copy has been furnished to the Division of Labor Standards, P.O. Box 449, Jefferson City, MO 65102-0449 pursuant to 8 CSR 20-5.010(1). A certified copy of the Annual Wage Order has been filed with the Secretary of State of Missouri.

Original Signed by
Todd Smith, Director
Division of Labor Standards

Filed With Secretary of State: **March 8, 2024**

Last Date Objections May Be Filed: **April 8, 2024**

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	$62.47
Boilermaker	$30.53*
Bricklayer-Stone Mason	$54.17
Carpenter	$50.84
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	$43.74
Plasterer	
Communication Technician	$57.89
Electrician (Inside Wireman)	$58.31
Electrician Outside Lineman	$30.53*
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	$30.53*
Glazier	$56.48
Ironworker	$68.93
Laborer	$43.22
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	$30.53*
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	$67.64
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	$42.11
Plumber	$70.54
Pipe Fitter	
Roofer	$54.75
Sheet Metal Worker	$57.54
Sprinkler Fitter	$52.79
Truck Driver	$30.53*
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. The public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.
**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title as defined in RSMo Section 290.210.

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	$55.19
Millwright	
Pile Driver	
Electrician (Outside Lineman)	$80.11
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	$48.42
General Laborer	
Skilled Laborer	
Operating Engineer	$63.82
Group I	
Group II	
Group III	
Group IV	
Truck Driver	$48.68
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

Use Heavy Construction Rates on Highway and Heavy construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(3).

Use Building Construction Rates on Building construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(2).

If a worker is performing work on a heavy construction project within an occupational title that is not listed on the Heavy Construction Rate Sheet, use the rate for that occupational title as shown on the Building Construction Rate Sheet.

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. Public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.

**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title.

OVERTIME
and
HOLIDAYS

OVERTIME

For all work performed on a Sunday or a holiday, not less than twice (2x) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work.

For all overtime work performed, not less than one and one-half (1½) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work or contractual obligation. For purposes of this subdivision, **"overtime work"** shall include work that exceeds ten hours in one day and work in excess of forty hours in one calendar week; and

A thirty-minute lunch period on each calendar day shall be allowed for each worker on a public works project, provided that such time shall not be considered as time worked.

HOLIDAYS

January first;
The last Monday in May;
July fourth;
The first Monday in September;
November eleventh;
The fourth Thursday in November; and
December twenty-fifth;

If any holiday falls on a Sunday, the following Monday shall be considered a holiday.

SECTION 011000 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract including General and Supplementary Conditions and Division 1 Specification Sections apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The Project consists of the complete restoration of two large historic fountains and related mechanical and landscape work.

1. Project Location: Missouri State Capitol Building, 201 West Capitol Avenue, Jefferson City, MO 65101

2. Owner: State of Missouri, Office of Administration, Division of Facilities Management, Design and Construction, Harry S Truman State Office Building, Post Office Box 809, 301 West High Street, Jefferson City, Missouri 65102.

B. Contract Documents, dated **May 6, 2024** were prepared for the Project by **Waters Edge Aquatic Design** and their consultants.

C. The Work consists of the restoration of two large, historic fountains and related mechanical and landscape work on the South Lawn of the Missouri State Capitol Building.

1. The Work includes: masonry restoration and cleaning, including repointing; masonry cleaning by media blasting (under the direction of the preservation masonry contractor); masonry replacement; waterproofing fountain basin coating; concrete repairs; sealants; new fountain grate and fixtures within basin; new fountain equipment and piping; underwater lighting in fountain basin; fountain systems testing for pressure and leakage (fountain piping, water supply, other piping) and new landscape and irrigation.

2. The Alternate Work includes: replacement of below-grade fountain piping.

D. The Work will be constructed under a single prime contract.

1.3 WORK SEQUENCE

A. The Work will be conducted in **two (2) phases.**

1. **Phase 1: Exterior Work**

Masonry restoration and cleaning, including repointing; masonry cleaning by media blasting (under the direction of the preservation masonry contractor); masonry replacement; waterproofing fountain basin coating; concrete repairs; sealants; new fountain grate and fixtures within basin; new fountain equipment and piping; underwater lighting in fountain basins and new landscape and irrigation.

Work on Phase 1 to be completed prior to <u>November 14, 2025</u>.

2. **Phase 2: Fountains Systems Testing**

Fountains systems startup, testing for pressure and leakage (fountain piping, water supply, other piping), and water loss testing.

Work on Phase 2 to be completed prior to <u>April 3, 2026</u>.

1.4 CONTRACTOR USE OF PREMISES

A. General: During the construction period the Contractor shall have full use of the premises within the project area, as defined on Sheet A-100 for construction operations.

B. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.

1. Owner Occupancy: Allow for Owner occupancy and use by the public.
2. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Use of the Existing Building: Maintain the existing building in a weathertight condition throughout the construction period. Repair damage cause by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.

1.5 OCCUPANCY REQUIREMENTS

A. Full Owner Occupancy: The Owner will occupy the adjacent site and existing building during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate owner usage. Perform the Work so as not to interfere with the Owner's operations.

PART 2 - PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 011000

SECTION 012100 – ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements governing allowances.

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:

1. Weather allowances
2. Facility interruption allowances

C. Related Sections include the following:

1. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders for allowances.
2. Division 1 Section "Unit Prices" for procedures for using unit prices.

1.3 WEATHER ALLOWANCE

A. Included within the completion period for this project are a specified number of “bad weather” days (see Schedule of Allowances).

B. The Contractor’s progress schedule shall clearly indicate the bad weather day allowance as an “activity” or “activities”. In the event weather conditions preclude performance of critical work activities for 50% or more of the Contractor’s scheduled workday, that day shall be declared unavailable for work due to weather (a “bad weather” day) and charged against the above allowance. Critical work activities will be determined by review of the Contractor’s current progress schedule.

C. The Contractor’s Representative and the Construction Representative shall agree monthly on the number of “bad weather” days to be charged against the allowance. This determination will be documented in writing and be signed by the Contractor and the Construction Representatives. If there is a failure to agree on all or part of the “bad weather” days for a particular month, that disagreement shall be noted on this written document and signed by each party’s representative. Failure of the Contractor’s representative to sign the “bad weather” day documentation after it is presented, with or without the notes of disagreement, shall constitute agreement with the “bad weather” day determination contained in that document.

D. There will be no modification to the time of contract performance due solely to the failure to deplete the “bad weather” day allowance.

E. Once this allowance is depleted, a no cost Change Order time extension will be executed for "bad weather" days, as defined above, encountered during the remainder of the Project.

1.4 FACILITY INTERRUPTION DAYS

A. Included within the completion period for this project are a specified number of facility interruption days (see Schedule of Allowances)\

B. In the event the State stops work without cause for 50% or more of the Contractor's scheduled workday, that day shall be declared unavailable for work (a facility interruption day) and charged against the above allowance. Critical work activities will be determined by review of the Contractor's current progress schedule.

C. The Contractor's Representative and the Construction Representative shall agree monthly on the number of facility interruption days to be charged against the allowance. This determination will be documented in writing and signed by the Contractor and Construction representatives using the practices conforming to 013115 project management communications. If there is a failure to agree on all or part of the facility interruption days for a particular month, that disagreement shall be noted in the submitted documents and signed by each party's representative. Failure of the Contractor's representative to submit or sign the facility interruption day documentation after is presented, with or without the notes of the disagreement, shall constitute agreement with the facility interruption day determination contained in that document.

D. There will be no modification to the time of contract performance due solely to the failure to deplete the facility interruption day allowance.

E. Once this allowance is depleted, a no cost Change Order time extension will be executed for facility interruption days, as defined above, encountered during remainder of the project as agreed upon by the Construction Representative.

1.5 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Weather Allowance: Included within the completion period for this Project 10 "bad weather" days.

B. Facility Allowance: Included within the completion period for this Project is 5 "facility interruption" days.

END OF SECTION 012100

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Bid Form and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements governing Alternates.

1.3 DEFINITIONS

A. Definition: An alternate is an amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents..

1. The cost for each alternate is the net addition to the Contract Sum to incorporate the Alternate into the Work. No other adjustments are made to the Contract Sum.

B. No additional time will be allowed for alternate work unless the number of work days is so stated on the bid form.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent Work as necessary to completely and fully integrate the Alternate Work into the Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.

B. Notification: The award of the Contract will indicate whether alternates have been accepted or rejected.

C. Execute accepted alternates under the same conditions as other Work of this Contract.

D. Schedule: A “Schedule of Alternates” is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials necessary to achieve the Work described under each alternate.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1: *Replace below-grade fountain piping located in south lawn of Capitol Building grounds. See Drawing Sheets M101 – Fountain Site Piping Plan and Drawing Sheet M102 – Fountain Site Drainage Plan.*

END OF SECTION 012300

SECTION 012600 – CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract Modifications.

B. Related Sections include the following:

1. Division 1, Section 012100 "Allowances" for procedural requirements for handling and processing Allowances.
2. Division 1, Section 012200 "Unit Prices" for administrative requirements for using Unit Prices.
3. Division 1, Section 013115 “Project Management Communications” for administrative requirements for communications.
4. Division 0, Section 007213, Article 3.1 "Acceptable Substitutions" for administrative procedures for handling Requests for Substitutions made after Contract award.
5. Division 0, Section 007213, Article 4.0 "Changes in the Work" for Change Order requirements.

1.3 REQUESTS FOR INFORMATION

A. In the event that the Contractor or Subcontractor, at any tier, determines that some portion of the Drawings, Specifications, or other Contract Documents requires clarification or interpretation, the Contractor shall submit a “Request for Information” (RFI) in writing to the Designer. A RFI may only be submitted by the Contractor and shall only be submitted on the RFI forms provided by the Owner. The Contractor shall clearly and concisely set forth the issue for which clarification or interpretation is sought and why a response is needed. In the RFI, the Contractor shall set forth an interpretation or understanding of the requirement along with reasons why such an understanding was reached.

B. Responses to RFI shall be issued within ten (10) working days of receipt of the Request from the Contractor unless the Designer determines that a longer time is necessary to provide an adequate response. If a longer time is determined necessary by the Designer, the Designer will, within five (5) working days of receipt of the request, notify the Contractor of the anticipated response time. If the Contactor submits a RFI on a time sensitive activity on the current project schedule, the Contractor shall not be entitled to any time extension due to the time it takes the Designer to respond to the request provided that the Designer responds within the ten (10) working days set forth above.

C. Responses from the Designer will not change any requirement of the Contract Documents. In the event the Contractor believes that a response to a RFI will cause a change to the requirements of the Contract Document, the Contractor shall give written

notice to the Designer requesting a Change Order for the work. Failure to give such written notice within ten (10) working days, shall waive the Contractor's right to seek additional time or cost under Article 4, "Changes in the Work" of the General Conditions.

1.4 MINOR CHANGES IN THE WORK

A. Designer will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Amount or the Contract Time, on "Designer's Supplemental Instructions" (DSI).

1.5 PROPOSAL REQUESTS

A. The Designer or Owner Representative will issue a detailed description of proposed Changes in the Work that may require adjustment to the Contract Amount or the Contract Time. The proposed Change Description will be issued using the "Request for Proposal" (RFP) form. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by the Designer or Owner Representative are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.

2. Within ten (10) working days after receipt of Proposal Request, submit a proposal for the cost adjustments to the Contract Amount and the Contract Time necessary to execute the Change. The Contractor shall submit his proposal on the appropriate Change Order Detailed Breakdown form. Subcontractors may use the appropriate Change Order Detailed Breakdown form or submit their proposal on their letterhead provided the same level of detail is included. All proposals shall include:

   a. A detailed breakdown of costs per Article 4.1 of the General Conditions.

   b. If requesting additional time per Article 4.2 of the General Conditions, include an updated Contractor's Construction Schedule that indicates the effect of the Change including, but not limited to, changes in activity duration, start and finish times, and activity relationship.

1.6 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, the Designer or Owner Representative will issue a Change Order for signatures of Owner and Contractor on the "Change Order" form.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 013100 – COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Projects including, but not limited to, the following:

1. Coordination Drawings.
2. Administrative and supervisory personnel.
3. Project meetings.

B. Each Contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific Contractor.

C. Related Sections include the following:

1. Division 1, Section 013200 "Schedules" for preparing and submitting Contractor's Construction Schedule.
2. Articles 1.8.B and 1.8.C of Section 007213 "General Conditions" for coordinating meetings onsite.
3. Article 5.4.H of Section 007213 "General Conditions" for coordinating Closeout of the Contract.

1.3 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections, which depend on each other for proper installation, connection, and operation.

B. Coordination: Each Contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each Contractor shall coordinate its operations with operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other Contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required

maintenance, service, and repair of all components including mechanical and electrical.

C. Prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate Contractors if coordination of their Work is required.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other Contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Startup and adjustment of systems.
8. Project Closeout activities.

E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.4 SUBMITTALS

A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

B. Key Personnel Names: Within ten (10) work days of starting construction operations, submit a list of key personnel assignments including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.5 PROJECT MEETINGS

A. The Owner’s Construction Representative will schedule a Pre-Construction Meeting prior to beginning of construction. The date, time, and exact place of this meeting will be determined after Contract Award and notification of all interested parties. The

Contractor shall arrange to have the Job Superintendent and all prime Subcontractors present at the meeting. During the Pre-Construction Meeting, the construction procedures and information necessary for submitting payment requests will be discussed and materials distributed along with any other pertinent information.

1. Minutes: Designer will record and distribute meeting minutes.

B. Progress Meetings: The Owner's Construction Representative will conduct Monthly Progress Meetings as stated in Articles 1.8.B and 1.8.C of Section 007213 "General Conditions".

1. Minutes: Designer will record and distribute to Contractor the meeting minutes.

C. Preinstallation Conferences: Contractor shall conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of Manufacturers and Fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Designer and Construction Representative of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration including requirements for the following:

a. Contract Documents

b. Options

c. Related RFIs

d. Related Change Orders

e. Purchases

f. Deliveries

g. Submittals

h. Review of mockups

i. Possible conflicts

j. Compatibility problems

k. Time schedules

l. Weather limitations

m. Manufacturer's written recommendations

n. Warranty requirements

o. Compatibility of materials

p. Acceptability of substrates

q. Temporary facilities and controls

r. Space and access limitations

s. Regulations of authorities having jurisdiction

t. Testing and inspecting requirements

u. Installation procedures

v. Coordination with other Work

w. Required performance results

x. Protection of adjacent Work

y. Protection of construction and personnel

3. Contractor shall record significant conference discussions, agreements, and disagreements including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

6. Revise paragraph below if Project requires holding progress meetings at different intervals. Insert special intervals such as "every third Tuesday" to suit special circumstances.

7. Project name

8. Name and address of Contractor

9. Name and address of Designer

10. RFI number including RFIs that were dropped and not submitted

11. RFI description

12. Date the RFI was submitted

13. Date Designer's response was received

14. Identification of related DSI or Proposal Request, as appropriate

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013115 - PROJECT MANAGEMENT COMMUNICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract including General and Supplementary Conditions, Bid Form, and other Division 1 Specification Sections apply to this Section.

B. Division 1, Section 013300 - Submittals

C. Division 1, Section 012600 – Contract Modification Procedures

1.2 SUMMARY

A. Project Management Communications: The Contractor shall use the Internet web based project management communications tool, E-Builder® ASP software, and protocols included in that software during this project. The use of project management communications as herein described does not replace or change any contractual responsibilities of the participants.
   1. Project management communications is available through E-Builder® as provided by "e-Builder®" in the form and manner required by the Owner.
   2. The project communications database is on-line and fully functional. User registration, electronic and computer equipment, and Internet connections are the responsibility of each project participant. The sharing of user accounts is prohibited

B. Support: E-Builder® will provide on-going support through on-line help files.

C. Copyrights and Ownership: Nothing in this specification or the subsequent communications supersedes the parties' obligations and rights for copyright or document ownership as established by the Contract Documents. The use of CAD files, processes or design information distributed in this system is intended only for the project specified herein.

D. Purpose: The intent of using E-Builder® is to improve project work efforts by promoting timely initial communications and responses. Secondly, to reduce the number of paper documents while providing improved record keeping by creation of electronic document files

E. Authorized Users: Access to the web site will be by individuals who are authorized users.
   1. Individuals shall complete the E-Builder New Company/User Request Form located at the following web site: https://oa.mo.gov/facilities/vendor-links/contractor-forms.

Completed forms shall be emailed to the following email address: OA.FMDCE-BuilderSupport@oa.mo.gov.

2. Authorized users will be contacted directly and assigned a temporary user password.
3. Individuals shall be responsible for the proper use of their passwords and access to data as agents of the company in which they are employed.

F. Administrative Users: Administrative users have access and control of user licenses and all posted items. DO NOT POST PRIVATE OR YOUR COMPANY CONFIDENTIAL ITEMS IN THE DATABASE! Improper or abusive language toward any party or repeated posting of items intended to deceive or disrupt the work of the project will not be tolerated and will result in deletion of the offensive items and revocation of user license at the sole discretion of the Administrative User(s).

G. Communications: The use of fax, email and courier communication for this project is discouraged in favor of using E-Builder® to send messages. Communication functions are as follows:
1. Document Integrity and Revisions:
   a. Documents, comments, drawings and other records posted to the system shall remain for the project record. The authorship time and date shall be recorded for each document submitted to the system. Submitting a new document or record with a unique ID, authorship, and time stamp shall be the method used to make modifications or corrections.
   b. The system shall make it easy to identify revised or superseded documents and their predecessors.
   c. Server or Client side software enhancements during the life of the project shall not alter or restrict the content of data published by the system. System upgrades shall not affect access to older documents or software.
2. Document Security:
   a. The system shall provide a method for communication of documents. Documents shall allow security group assignment to respect the contractual parties communication except for Administrative Users. DO NOT POST PRIVATE OR YOUR COMPANY CONFIDENTIAL ITEMS IN THE DATABASE!
3. Document Integration:
   a. Documents of various types shall be logically related to one another and discoverable. For example, requests for information, daily field reports, supplemental sketches and photographs shall be capable of reference as related records.
4. Reporting:
   a. The system shall be capable of generating reports for work in progress, and logs for each document type. Summary reports generated by the system shall be available for team members.
5. Notifications and Distribution:
   a. Document distribution to project members shall be accomplished both within the extranet system and via email as appropriate. Project document distribution to parties outside of the project communication system shall be

accomplished by secure email of outgoing documents and attachments, readable by a standard email client.

6. Required Document Types:
    a. RFI, Request for Information.
    b. Submittals, including record numbering by drawing and specification section.
    c. Transmittals, including record of documents and materials delivered in hard copy.
    d. Meeting Minutes.
    e. Application for Payments (Draft or Pencil).
    f. Review Comments.
    g. Field Reports.
    h. Construction Photographs.
    i. Drawings.
    j. Supplemental Sketches.
    k. Schedules.
    l. Specifications.
    m. Request for Proposals
    n. Designer's Supplemental Instructions
    o. Punch Lists

H. Record Keeping: Except for paper documents, which require original signatures and large format documents (greater than 8½ x 11 inches), all other 8½ x 11 inches documents shall be submitted by transmission in electronic form to the E-Builder® web site by licensed users.
    a. The Owner and his representatives, the Designer and his consultants, and the Contractor and his Sub Contractors and suppliers at every tier shall respond to documents received in electronic form on the web site, and consider them as if received in paper document form.
    b. The Owner and his representatives, the Designer and his consultants, and the Contractor and his Sub Contractors and suppliers at every tier reserves the right to and shall reply or respond by transmissions in electronic form on the web site to documents actually received in paper document form.
    c. The Owner and his representatives, the Designer and his consultants, and the Contractor and his Sub Contractors and suppliers at every tier reserves the right to and shall copy any paper document into electronic form and make same available on the web site.

I. Minimum Equipment and Internet Connection: In addition to other requirements specified in this Section, the Owner and his representatives, the Construction Manager and his representatives, the Architect and his consultants, and the Contractor and his sub-contractors and suppliers at every tier required to have a user license(s) shall be responsible for the following:

1. Providing suitable computer systems for each licensed user at the users normal work location[1] with high-speed Internet access, i.e. DSL, local cable company's Internet connection, or T1 connection.
2. Each of the above referenced computer systems shall have the following minimum system[2] and software requirements:
    a. Desktop configuration (Laptop configurations are similar and should be equal to or exceed desktop system.)
        1) Operating System: Windows XP or newer
        2) Internet Browser: Internet Explorer 6.01SP2+ (Recommend IE7.0+)
        3) Minimum Recommend Connection Speed: 256K or above
        4) Processor Speed: 1 Gigahertz and above
        5) RAM: 512 mb
        6) Operating system and software shall be properly licensed.
        7) Internet Explorer version 7 (current version is a free distribution for download). This specification is not intended to restrict the host server or client computers provided that industry standard HTTP clients may access the published content.
        8) Adobe Acrobat Reader (current version is a free distribution for download).
        9) Users should have the standard Microsoft Office Suite (current version must be purchased) or the equivalent.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable.)

END OF SECTION 013115

[1] The normal work location is the place where the user is assigned for more than one-half of his time working on this project.
[2] The minimum system herein will not be sufficient for many tasks and may not be able to process all documents and files stored in the E-Builder® Documents area.

SECTION 013200 – SCHEDULE – BAR CHART

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract including General and Supplementary Conditions, Bid Form, and other Division 1 Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section includes requirements for a Bar Chart Schedule for the project construction activities, schedule of submittals, and schedule for testing.

PART 2 - PRODUCTS – (Not Applicable)

PART 3 - EXECUTION

3.1 SUBMITTAL PROCEDURES

A. The Contractor shall submit to the Designer, within ten (10) working days following the Notice to Proceed, a Progress Schedule including Schedule of Values showing the rate of progress the Contractor agrees to maintain and the order in which he proposed to carry out the various phases of Work. No payments shall be made to the Contractor until the Progress Schedule has been approved by the Owner.

1. The Schedule of Values must have the following line items included with the value of the item as indicated below:

    a. O&M's (Owner's Manual)

        1) $1,000,000.00 (One million) and under – 2% of the total contract amount

        2) Over $1,000,000.00 (One million) – 1% of the total contract amount

    b. Close Out Documents

        1) $1,000,000.00 (One million) and under – 2% of the total contract amount

        2) Over $1,000,000.00 (One million) – 1% of the total contract amount

    c. General Conditions

        1) No more than 10%

B. The Contractor shall submit an updated Schedule for presentation at each Monthly Progress Meeting. The Schedule shall be updated by the Contractor as necessary to reflect the current Schedule and its relationship to the original Schedule. The updated Schedule shall reflect any changes in the logic, sequence, durations, or completion date. Payments to the Contractor shall be suspended if the Progress Schedule is not adequately updated to reflect actual conditions.

C. The Contractor shall submit Progress Schedules to Subcontractors to permit coordinating their Progress Schedules to the general construction Work. The Contractor shall coordinate preparation and processing of Schedules and reports with performance of other construction activities.

3.2 CONSTRUCTION PROGRESS SCHEDULE – BAR CHART SCHEDULE

A. Bar-Chart Schedule: The Contractor shall prepare a comprehensive, fully developed, horizontal bar chart-type Contractor's Construction Schedule. The Contractor for general construction shall prepare the Construction Schedule for the entire Project. The Schedule shall show the percentage of work to be completed at any time, anticipated monthly payments by Owner, as well as significant dates (such as completion of excavation, concrete foundation work, underground lines, superstructure, rough-ins, enclosure, hanging of fixtures, etc.) which shall serve as check points to determine compliance with the approved Schedule. The Schedule shall also include an activity for the number of "bad" weather days specified in Section 012100 – Allowances.

1. The Contractor shall provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week.

    a. If practical, use the same Schedule of Values breakdown for schedule time bars.

2. The Contractor shall provide a base activity time bar showing duration for each construction activity. Each bar is to indicate start and completion dates for the activity. The Contractor is to place a contrasting bar below each original schedule activity time for indicating actual progress and planned remaining duration for the activity.

3. The Contractor shall prepare the Schedule on a minimal number of separate sheets to readily show the data for the entire construction period.

4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on schedule with other construction activities. Include minor elements involved in the overall sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.

5. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other required schedules and reports.

6. Indicate the Intent to Award and the Contract Substantial Completion dates on the schedule.

B. Phasing: Provide notations on the schedule to show how the sequence of the Work is affected by the following:

1. Requirement for Phased completion

2. Work by separate Contractors

3. Work by the Owner

4. Pre-purchased materials

5. Coordination with existing construction

6. Limitations of continued occupancies

7. Un-interruptible services
8. Partial Occupancy prior to Substantial Completion
9. Site restrictions
10. Provisions for future construction
11. Seasonal variations
12. Environmental control

C. Work Stages: Use crosshatched bars to indicate important stages of construction for each major portion of the Work. Such stages include, but are not necessarily limited to, the following:

1. Subcontract awards
2. Submittals
3. Purchases
4. Mockups
5. Fabrication
6. Sample testing
7. Deliveries
8. Installation
9. Testing
10. Adjusting
11. Curing
12. Startup and placement into final use and operation

D. Area Separations: Provide a separate time bar to identify each major area of construction for each major portion of the Work. For the purposes of this Article, a "major area" is a story of construction, a separate building, or a similar significant construction element.

1. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
    a. Structural completion.
    b. Permanent space enclosure
    c. Completion of mechanical installation
    d. Completion of the electrical portion of the Work
    e. Substantial Completion

3.3 SCHEDULE OF SUBMITTALS

A. Upon acceptance of the Construction Progress Schedule, prepare and submit a complete schedule of submittals. Coordinate the submittal schedule with Section 013300 SUBMITTALS, the approved Construction Progress Schedule, list of subcontracts, Schedule of Values and the list of products.

B. Prepare the schedule in chronological order. Provide the following information

1. Scheduled date for the first submittal
2. Related Section number
3. Submittal category
4. Name of the Subcontractor
5. Description of the part of the Work covered
6. Scheduled date for resubmittal
7. Scheduled date for the Designer's final release or approval

C. Distribution: Following the Designer's response to the initial submittal schedule, print and distribute copies to the Designer, Owner, subcontractors, and other parties required to comply with submittal dates indicated.

1. Post copies in the Project meeting room and temporary field office.
2. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned part of the Work and are no longer involved in construction activities.

D. Schedule Updating: Revise the schedule after each meeting or other activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

3.4 SCHEDULE OF INSPECTIONS AND TESTS

A. Prepare a schedule of inspections, tests, and similar services required by the Contract Documents. Submit the schedule with (15) days of the date established for commencement of the Contract Work. The Contractor is to notify the testing agency at least (5) working days in advance of the required tests unless otherwise specified.

B. Form: This schedule shall be in tabular form and shall include, but not be limited to, the following:

1. Specification Section number
2. Description of the test
3. Identification of applicable standards
4. Identification of test methods
5. Number of tests required
6. Time schedule or time span for tests
7. Entity responsible for performing tests
8. Requirements for taking samples
9. Unique characteristics of each service

C. Distribution: Distribute the schedule to the Owner, Architect, and each party involved in performance of portions of the Work where inspections and tests are required.

END OF SECTION 013200

SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Preconstruction photographs.
2. Periodic construction photographs.
3. Final completion construction photographs.

B. Related Requirements:

1. Section 017700 "Closeout Procedures" for submitting photographic documentation as Project Record Documents at Project closeout.
2. Section 024296 "Historic Removal and Dismantling" for photographic documentation before selective deconstruction and demolition operations commence.

1.2 INFORMATIONAL SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

B. Digital Photographs: Submit image files within five days of taking photographs.

1. Submit photos by uploading to web-based project software site. Include copy of key plan indicating each photograph's location and direction.
2. Identification: Provide the following information with each image description in web-based project software site:

a. Name of Project.
b. Name and contact information for photographer.
c. Name of Architect.
d. Name of Contractor.
e. Date photograph was taken.
f. Description of location, vantage point, and direction.
g. Unique sequential identifier keyed to accompanying key plan.

1.3 QUALITY ASSURANCE

A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

1.4 FORMATS AND MEDIA

A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 3200 by

2400 pixels, and with vibration-reduction technology. Use flash in low light levels or backlit conditions.

B. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

C. Metadata: Record accurate date and time and GPS location data from camera.

D. File Names: Name media files with date and sequential numbering suffix.

1.5 CONSTRUCTION PHOTOGRAPHS

A. Photographer: Engage a qualified photographer to take construction photographs.

B. General: Take photographs with maximum depth of field and in focus.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

C. Preconstruction Photographs: Before starting demolition or construction, take photographs of Project site and fountains, interior of fountain equipment rooms inside the Capitol, and all routes to get to the interior fountain rooms, including existing items to remain during construction, from different vantage points, as directed by Architect and Owner.

1. Take photographs in quantity necessary to show existing conditions before starting the Work. Minimally, 200 photographs.

D. Process Photographs: Take photographs as required to properly document the restoration and treatment of the fountains.

E. Periodic Construction Photographs: Take 50 photographs weekly coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

F. Final Completion Construction Photographs: Take 50 photographs after date of Substantial Completion for submission as Project Record Documents. Architect and Owner will inform photographer of desired vantage points.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013233

SECTION 013300 – SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract including General and Supplementary Conditions, Bid Form, and other Division 1 Specification Sections apply to this Section.

B. Division 1, Section 013115 “Project Management Communications” for administrative requirements for communications.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submittals required for performance of the Work including the following:

1. Shop Drawings
2. Product Data
3. Samples
4. Quality Assurance Submittals
5. Construction Photographs
6. Operating and Maintenance Manuals
7. Warranties

B. Administrative Submittals: Refer to General and Supplementary Conditions other applicable Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:

1. Construction Progress Schedule including Schedule of Values
2. Performance and Payment Bonds
3. Insurance Certificates
4. Applications for Payment
5. Certified Payroll Reports
6. Partial and Final Receipt of Payment and Release Forms
7. Affidavit – Compliance with Prevailing Wage Law
8. Record Drawings
9. Notifications, Permits, etc.

C. The Contractor is obliged and responsible to check all shop drawings and schedules to assure compliance with contract plans and specifications. The Contractor is responsible for the content of the shop drawings and coordination with other contract work. Shop drawings and schedules shall indicate, in detail, all parts of an Item or Work including erection and setting instructions and integration with the Work of other trades.

D. The Contractor shall at all times make a copy, of all approved submittals, available on site to the Construction Representative.

1.3 SUBMITTAL PROCEDURES

A. The Contractor shall comply with the General and Supplementary Conditions and other applicable sections of the Contract Documents. The Contractor shall submit, with such promptness as to cause no delay in his work or in that of any other contractors, all required submittals indicated in Part 3.1 of this section and elsewhere in the Contract Documents. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

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 elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
    a. The Designer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

B. Each drawing and/or series of drawings submitted must be accompanied by a letter of transmittal giving a list of the titles and numbers of the drawings. Each series shall be numbered consecutively for ready reference and each drawing shall be marked with the following information:

1. Date of Submission
2. Name of Project
3. Location
4. Section Number of Specification
5. State Project Number
6. Name of Submitting Contractor
7. Name of Subcontractor
8. Indicate if Item is submitted as specified or as a substitution

1.4 SHOP DRAWINGS

A. Comply with the General Conditions, Article 3.2.

B. The Contractor shall submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.

C. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings including the following information:

1. Dimensions
2. Identification of products and materials included by sheet and detail number
3. Compliance with specified standards
4. Notation of coordination requirements

5. Notation of dimensions established by field measurement

6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8½"x11" but no larger than 36"x48".

1.5 PRODUCT DATA

A. The Contractor shall comply with the General Conditions, Article 3.2.

B. The Contractor shall collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information including the following information:

a. Manufacturer's printed recommendations

b. Compliance with Trade Association standards

c. Compliance with recognized Testing Agency standards

d. Application of Testing Agency labels and seals

e. Notation of dimensions verified by field measurement

f. Notation of coordination requirements

2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

1.6 SAMPLES

A. The Contractor shall comply with the General Conditions, Article 3.2.

B. The Contractor shall submit full-size, fully fabricated samples, cured and finished as specified, and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.

1. The Contractor shall mount or display samples in the manner to facilitate review of qualities indicated. Prepare samples to match the Designer's sample including the following:

a. Specification Section number and reference

b. Generic description of the Sample

c. Sample source

d. Product name or name of the Manufacturer

e. Compliance with recognized standards

f. Availability and delivery time

2. The Contractor shall submit samples for review of size, kind, color, pattern, and texture. Submit samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least three (3) multiple units that show approximate limits of the variations.

b. Refer to other Specification Sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

c. Refer to other Sections for samples to be returned to the Contractor for incorporation in the Work. Such samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of sample submittals.

d. Samples not incorporated into the Work, or otherwise designated as the Owner's property, are the property of the Contractor and shall be removed from the site prior to Substantial Completion.

3. Field samples are full-size examples erected onsite to illustrate finishes, coatings, or finish materials and to establish the Project standard.

a. The Contractor shall comply with submittal requirements to the fullest extent possible. The Contractor shall process transmittal forms to provide a record of activity.

1.7 QUALITY ASSURANCE DOCUMENTS

A. The Contractor shall comply with the General Conditions, Article 3.2

B. The Contractor shall submit quality control submittals including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.

C. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the Manufacturer certifying compliance with specified requirements.

1. Signature: Certification shall be signed by an officer of the Manufacturer or other individual authorized to contractually bind the Company.

D. Inspection and Test Reports: The Contractor shall submit the required inspection and test reports from independent testing agencies as specified in this Section and in other Sections of the Contract Documents.

E. Construction Photographs: The Contractor shall submit record construction photographs as specified in this Section and in other Sections of the Contract Documents.

1. The Contractor shall submit digital photographs. The Construction Administrator shall determine the quantity and naming convention at the preconstruction meeting.

2. The Contractor shall identify each photograph with project name, location, number, date, time, and orientation.

3. The Contractor shall submit progress photographs monthly unless specified otherwise. Photographs shall be taken one (1) week prior to submitting.

4. The Contractor shall take four (4) site photographs from differing directions and a minimum of five (5) interior photographs indicating the relative progress of the Work.

1.8 OPERATING AND MAINTENANCE MANUALS AND WARRANTIES

A. The Contractor shall submit all required manufacturer's operating instructions, maintenance/service manuals, and warranties in accordance with the General Conditions, Article 3.5, and Supplementary Conditions along with this and other Sections of the Contract Documents.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 REQUIRED SUBMITTALS

A. Contractor shall submit the following information for materials and equipment to be provided under this contract.

SPEC SECTION	TITLE	CATEGORY
013200	Schedules INCLUDING (as noted in each submittal): Preinstallation Conferences, Mockups	Construction Schedule
013200	Schedules	Schedule of Values
013200	Schedules	List of Subcontractors
013200	Schedules	Major Material Suppliers
013233	Photographic Documentation	As-Builts
013591	Historic Treatment Procedures	
013591	*1.4.A - Historic Treatment Subschedule*	Construction Schedule
013591	*1.7.B - Preconstruction Documentation*	Construction Schedule
013591	*1.7.C - Historic Treatment Program*	Construction Schedule
013591	*1.7.D - Fire Prevention Plan*	Construction Schedule
013591	*1.8.C - Lead-safe Certifications*	Certification
017900	1.4 Demonstration and Training	As-Builts
024100	Demolition	Shop Drawings
024926	Historic Removal And Dismantling *1.5 - Items to Be Salvaged*	Shop Drawings
033005	Cast in Place Concrete	Shop Drawings
040110	Masonry Cleaning & Treatment *1.7.A. Chemical Cleaner Manufacturer* Applicator Qualifications	Certification
040110	Masonry Cleaning & Treatment *1.8.B. Applicator Qualifications*	Certification
040110	Masonry Cleaning & Treatment *1.8.C.Cleaning Program*	Product Data
040110	Masonry Cleaning & Treatment *1.8.C. Mockups - Cleaning: Chemical, Detergent*	Mock up
040111	Masonry And Concrete Abrasive Cleaning *1.8.A - Material Descriptions And Test Data*	Product Data

040111	Masonry And Concrete Abrasive Cleaning *1.10.B - Cleaning Program*	Product Data
040111	Masonry And Concrete Abrasive Cleaning *1.10.C - Mockups - Limestone, Granite, Basin*	Mock up
040120	Masonry Rehabilitation *1.3.A - Custom Mortar Mix - Multiple Per Spec*	Mock up
040120	Masonry Rehabilitation *1.3.A.3 - Accessories*	Product Data
040120	Masonry Rehabilitation *1.3.A.4 - Replacement Stone Unit Samples - Multiple Per Spec*	Mock up
040120	Masonry Rehabilitation *1.3.B - Shop Drawings And Replacement Stone - Multiple Per Spec*	Shop Drawings
040120	Masonry Rehabilitation *1.3 - Mock-Up Replacement Stone And Dutchman Repairs - Multiple Per Spec*	Mock up
040120	Masonry Rehabilitation *1.3.C - Mock-Up Pointing And Patching Mortars - Multiple Per Spec*	Mock up
071613	Polymer Modified Cementitious Waterproofing	Product Data
071613	Polymer Modified Cementitious Waterproofing *1.6.A - Contractor Qualifications*	Certification
079200	Joint Sealants - Product Data and Schedule for Each Joint Sealant	Product Data
131163	Misc. Metals for Fountains - V-wire screen for fountain basin	Shop Drawings
131185	Fountain Equipment	Shop Drawings
131187	Chemical Controller	Shop Drawings
131190	Fountain Piping, Valves, and Related	Shop Drawings
131190	Fountain Piping, Valves, and Related 3.6 - Pressure and leakage testing reports	Test Report
131194	Fountain Mechanical Identification	Shop Drawings
260500	*Specs 260500 thru 262726:* Electrical Conduit, wiring, etc	Shop Drawings
260923	Lighting control devices	Shop Drawings
265600	Exterior lighting	Shop Drawings
328400	Planting Irrigation	Product Data
328400	Planting Irrigation	Shop Drawings
328400	Planting Irrigation	Certifications
328400	Planting Irrigation	Operations & Maintenance Manual
328400	Planting Irrigation	Warranty & As-Builts
329113	Soil Preparation	Product Data
329113	Soil Preparation	Test Report
329113	Soil Preparation - Samples	Mock up
329300	Plants	Product Data
329300	Plants	Shop Drawings

329300	Plants	Certifications
329300	Plants	Operations & Maintenance Manual
329300	Plants	Warranty & As-Builts
330507	Horizontal Directional Drilling	Shop Drawings
330507	Horizontal Directional Drilling *1.4.A - Qualifications of horizontal drilling contractor*	Certification

END OF SECTION 013300

SECTION 013513.10 - SITE SECURITY AND HEALTH REQUIREMENTS (OA)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract including General and Supplementary Conditions, Bid Form, and other Division 1 Specification Sections apply to this Section.

1.2 SUBMITTALS

A. List of required submittals:

1. Materials Safety Data Sheets for all hazardous materials to be brought onsite.
2. Schedule of proposed shutdowns, if applicable.
3. A list of the names of all employees who will submit fingerprints for a background check, and the signed privacy documents identified below for each employee.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 ACCESS TO THE SITE

A. The Contractor shall arrange with Facility Representatives to establish procedures for the controlled entry of workers and materials into the work areas at the Facility.

B. The Contractor shall establish regular working hours with Facility Representatives. The Contractor must report changes in working hours or overtime to Facility Representatives and obtain approval twenty-four (24) hours ahead of time. The Contractor shall report emergency overtime to Facility Representatives as soon as it is evident that overtime is needed. The Contractor must obtain approval from Facility Representatives for all work performed after dark.

C. The Contractor shall provide the name and phone number of the Contractor’s employee or agent who is in charge onsite; this individual must be able to be contacted in case of emergency. The Contractor must be able to furnish names and address of all employees upon request.

D. All construction personnel shall visibly display issued identification cards.

3.2 FIRE PROTECTION, SAFETY, AND HEALTH CONTROLS

A. The Contractor shall take all necessary precautions to guard against and eliminate possible fire hazards.

1. Onsite burning is prohibited.
2. The Contractor shall store all flammable or hazardous materials in proper containers

located outside the buildings or offsite, if possible.

3. The Contractor shall provide and maintain, in good order, during construction fire extinguishers as required by the National Fire Protection Association. In areas of flammable liquids, asphalt, or electrical hazards, 15-pound carbon dioxide or 20-pound dry chemical extinguishers shall be provided.

B. The Contractor shall not obstruct streets or walks without permission from the Owner's Construction Representative and Facility Representatives.

C. The Contractor's personnel shall not exceed the speed limit of 15 mph while at the Facility unless otherwise posted.

D. The Contractor shall take all necessary, reasonable measures to reduce air and water pollution by any material or equipment used during construction. The Contractor shall keep volatile wastes in covered containers, and shall not dispose of volatile wastes or oils in storm or sanitary drains.

E. The Contractor shall keep the project site neat, orderly, and in a safe condition at all times. The Contractor shall immediately remove all hazardous waste, and shall not allow rubbish to accumulate. The Contractor shall provide onsite containers for collection of rubbish and shall dispose of it at frequent intervals during the progress of the Work.

F. Fire exits, alarm systems, and sprinkler systems shall remain fully operational at all times, unless written approval is received from the Owner's Construction Representative and the appropriate Facility Representative at least twenty-four (24) hours in advance. The Contractor shall submit a written time schedule for any proposed shutdowns.

G. For all hazardous materials brought onsite, Material Safety Data Sheets shall be on site and readily available upon request at least a day before delivery.

H. Alcoholic beverages or illegal substances shall not be brought upon the Facility premises. The Contractor's workers shall not be under the influence of any intoxicating substances while on the Facility premises.

3.3 SECURITY CLEARANCES AND RESTRICTIONS

A. FMDC CONTRACTOR BACKGROUND AND ID BADGE PROCESS

1. All employees of an OA/FDMC contractor (or subcontractor performing work under an OA/FMDC contract) are required to submit a fingerprint check through the Missouri State Highway Patrol (MSHP) and the FBI enabling OA/FMDC to obtain state and national criminal background checks on the employees, unless stated otherwise in the Contractor's contract.
2. FMDC reserves the right to prohibit any employee of the Contractor from performing work in or on the premises of any facility owned, operated, or utilized by the State of Missouri for any reason.
3. The Contractor shall ensure all of its employees submit fingerprints to the Missouri State Highway Patrol and pay for the cost of such background checks. The Contractor shall submit to FMDC via email to FMDCSecurity@oa.mo.gov a list of the names of the Contractor's employees who will be fingerprinted and a signed OA/FMDC Authorization

for Release of Information Confidentiality Oath for each employee. All employees of the Contractor approved by FMDC to work at a State facility must obtain a contractor ID badge from FMDC prior to beginning work on-site, unless the Director of FMDC, at the Director's discretion, waives the requirement for a contractor ID badge. The Contractor and its employees must comply with the process for background checks and contractor ID badges found on FMDC's website at: https://oa.mo.gov/facilities/facilities-operations/security-information/fmdc-contractor-background-and-id-badge

4. Fingerprints and Authorization for Release of Information Confidentiality Oath form are valid for one (1) year and must be renewed annually. Changing or adding locations may result in additional required documentation. Certain employees may be required to be fingerprinted more frequently. OA/FMDC reserves the right to request additional background checks at any time for any reason.
5. The Contractor shall notify FMDC via email to FMDCSecurity@oa.mo.gov within 48 hours of anyone severing employment with their company.

3.4 DISRUPTION OF UTILITIES

A. The Contractor shall give a minimum of seventy-two (72) hours written notice to the Construction Representative and the Facility Representative before disconnecting electric, gas, water, fire protection, or sewer service to any building.

B. The Contractor shall give a minimum of seventy-two (72) hours written notice to the Construction Representative and Facility Representative before closing any access drives, and shall make temporary access available, if possible. The Contractor shall not obstruct streets, walks, or parking.

3.5 PROTECTION OF PERSONS AND PROPERTY

A. SAFETY PRECAUTIONS AND PROGRAMS

1. The Contractor shall at all times conduct operations under this Contract in a manner to avoid the risk of bodily harm to persons or risk of damage to any property. The Contractor shall promptly take precautions which are necessary and adequate against conditions created during the progress of the Contractor's activities hereunder which involve a risk of bodily harm to persons or a risk of damage to property. The Contractor shall continuously inspect Work, materials, and equipment to discover and determine any such conditions and shall be solely responsible for discovery, determination, and correction of any such conditions. The Contractor shall comply with applicable safety laws, standards, codes, and regulations in the jurisdiction where the Work is being performed, specifically, but without limiting the generality of the foregoing, with rules regulations, and standards adopted pursuant to the Williams-Steiger Occupational Safety and Health Act of 1970 and applicable amendments.
2. All contractors, subcontractors and workers on this project are subject to the Construction Safety Training provisions 292.675 RSMo.
3. In the event the Contractor encounters on the site, material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), lead, mercury, or other material known to be hazardous, which has not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the Owner's Representative and the Architect in writing. The Work in the affected area shall not thereafter be resumed except

by written agreement of the Owner's Representative and Contractor if in fact the material is asbestos or polychlorinated biphenyl (PCB) and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of asbestos or polychlorinated biphenyl (PCB), or when it has been rendered harmless by written agreement of the Owner's Representative and the Contractor. “Rendered Harmless” shall mean that levels of such materials are less than any applicable exposure standards, including but limited to OSHA regulations.

B. SAFETY OF PERSONS AND PROPERTY

1. The Contractor shall take reasonable precautions for safety of, and shall provide protection to prevent damage, injury, or loss to:

    a. clients, staff, the public, construction personnel, and other persons who may be affected thereby;
    b. the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor or the Contractor's Subcontractors of any tier; and
    c. other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

2. The Contractor shall give notices and comply with applicable laws, standards, codes, ordinances, rules, regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury, or loss.
3. The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, safeguards for safety and protection, including, but not limited to, posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent sites and utilities.
4. When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise the highest degree of care and carry on such activities under supervision of properly qualified personnel.
5. The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in this Section caused in whole or in part by the Contractor, a Subcontractor of any tier, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable, and for which the Contractor is responsible under this Section, except damage or loss attributable solely to acts or omissions of Owner or the Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's other obligations stated elsewhere in the Contract.
6. The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents, and the maintaining, enforcing and supervising of safety precautions and programs. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner's Representative and Architect. The Contractor shall hold regularly scheduled safety meetings to instruct Contractor personnel on safety practices, accident avoidance and prevention, and the Project Safety Program. The Contractor shall furnish safety equipment and enforce the use of such equipment by its employees and its subcontractors

of any tier.

7. The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.
8. The Contractor shall promptly report in writing to the Owner all accidents arising out of or in connection with the Work which cause death, lost time injury, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious property damages are caused, the accident shall be reported immediately.
9. The Contractor shall promptly notify in writing to the Owner of any claims for injury or damage to personal property related to the work, either by or against the Contractor.
10. The Owner assumes no responsibility or liability for the physical condition or safety of the Work site or any improvements located on the Work site. The Contractor shall be solely responsible for providing a safe place for the performance of the Work. The Owner shall not be required to make any adjustment in either the Contract Sum or Contract Time concerning any failure by the Contractor or any Subcontractor to comply with the requirements of this Paragraph.
11. In no event shall the Owner have control over, charge of, or any responsibility for construction means, methods, techniques, sequences or procedures or for safety precautions and programs in connection with the Work, notwithstanding any of the rights and authority granted the Owner in the Contract Documents.
12. The Contractor shall maintain at his own cost and expense, adequate, safe and sufficient walkways, platforms, scaffolds, ladders, hoists and all necessary, proper, and adequate equipment, apparatus, and appliances useful in carrying on the Work and which are necessary to make the place of Work safe and free from avoidable danger for clients, staff, the public and construction personnel, and as may be required by safety provisions of applicable laws, ordinances, rules regulations and building and construction codes.

END OF SECTION 013513.10

SECTION 013591 - HISTORIC TREATMENT PROCEDURES

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 treatment procedures for historic spaces, areas, rooms, and surfaces in Project.

B. The Missouri State Capitol Building and grounds are listed in the National Register of Historic Places.

C. Great care shall be taken to preserve all existing historic materials and finishes. It should be assumed that all finishes, millwork, flooring, wallcoverings, decorative painting, fixtures, and other finishes are historic or important to presenting the historic story of the building and are to be protected throughout construction.

D. All work must meet the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. The standards may be found here https://www.nps.gov/tps/standards.htm

E. The removal of historic materials or alteration of historic finishes or features and spaces will not be permitted. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of deteriorated features must be approved by the Construction Representative and Designer.

F. Related Requirements:

1. Section 015000 "Construction Facilities and Temporary Controls"

2. Section 024296 "Historic Removal and Dismantling" for selective demolition for historic materials.

3. All other Sections 2-49.

1.3 DEFINITIONS

A. Consolidate: To strengthen loose or deteriorated materials in place.

B. Design Reference Sample: A sample that represents Architect's prebid selection of work to be matched; it may be existing work or work specially produced for Project.

C. Dismantle: To disassemble or detach a historic item from a surface, or a nonhistoric item from a historic surface, using gentle methods and equipment to prevent damage to historic items and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

D. Historic: Spaces, areas, rooms, surfaces, materials, finishes, and overall appearance that are important to the successful preservation, rehabilitation, restoration, and reconstruction as determined by Architect. Designated historic areas and surfaces are indicated on Drawings.

E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.

F. Preserve: Act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property.

G. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.

H. Reinstall: To protect removed or dismantled item, repair and clean it as indicated for reuse, and reinstall it in original position, or where indicated.

I. Remove: To take down or detach a nonhistoric item located within a historic space, area, or room, using methods and equipment to prevent damage to historic items and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

J. Repair: To correct damage and defects, retaining existing materials, features, and finishes while employing as little new material as possible. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.

K. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.

L. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.

M. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.

N. Restore: To consolidate, replicate, reproduce, repair, and refinish as required to achieve the indicated results.

O. Retain: To keep existing items that are not to be removed or dismantled.

P. Reversible: New construction work, treatments, or processes that can be removed or undone in the future without damaging historic materials unless otherwise indicated.

Q. Salvage: To protect removed or dismantled items and deliver them to Owner ready for reuse.

R. Stabilize: To provide structural reinforcement of unsafe or deteriorated items while maintaining the essential form as it exists at present; also, to reestablish a weather-resistant enclosure.

S. Strip: To remove existing finish down to base material unless otherwise indicated.

1.4 COORDINATION

A. Historic Treatment Subschedule: In conjunction with the overall project schedule, Contractor shall provide a construction schedule coordinating the sequencing and scheduling of historic treatment work for entire Project, including each activity to be performed in historic spaces, areas, and rooms, and on historic surfaces; and based on Contractor's Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for historic treatment work.

1. Schedule construction operations in sequence required to obtain best historic treatment results.
2. Coordinate sequence of historic treatment work activities to accommodate the following:

    a. Owner's continuing occupancy of portions of existing building.
    b. Owner's partial occupancy of completed Work.
    c. Other known work in progress.
    d. Tests and inspections.

3. Detail sequence of historic treatment work, with start and end dates.
4. Utility Services: Indicate how long utility services will be interrupted. Coordinate shutoff, capping, and continuation of utility services.
5. Use of elevator and stairs.
6. Equipment Data: List gross loaded weight, axle-load distribution, and wheel-base dimension data for mobile and heavy equipment proposed for use. Do not use such equipment without certification from Contractor's professional engineer that the structure can support the imposed loadings without damage.

B. Pedestrian and Vehicular Circulation: Coordinate historic treatment work with circulation patterns within the Capitol site. Some work is near circulation patterns. Circulation patterns cannot be closed off entirely, and in places can be only temporarily redirected around small areas of work. Plan and execute the Work accordingly. The property is gated and will continue to be gated throughout the entire project.

1.5 PROJECT MEETINGS FOR HISTORIC TREATMENT

A. Preliminary Historic Treatment Conference: Before starting historic treatment work, conduct conference at Project site.

1. Attendees: In addition to representatives of Owner, Architect, and Contractor, testing service representative, historic treatment specialists (plaster, decorative and plain painting, millwork, etc.), specialty manufacturer(s) (storefront, alarm, and security), and installers whose work interfaces with or affects historic treatment shall be represented at the meeting (mechanical, plumbing, and electrical subcontractors).
2. Agenda: Discuss items of significance that could affect progress of historic treatment work, including review of the following:

    a. Historic Treatment Subschedule: Discuss and finalize; verify availability of materials, historic treatment specialists' personnel, equipment, and facilities needed to make progress and avoid delays.
    b. Fire-prevention plan.
    c. Governing regulations.
    d. Areas where existing construction is to remain and the required protection.
    e. Hauling routes.

f. Sequence of historic treatment work operations.
g. Storage, protection, and accounting for salvaged and specially fabricated items.
h. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
i. Qualifications of personnel assigned to historic treatment work and assigned duties.
j. Requirements for extent and quality of work, tolerances, and required clearances.
k. Methods and procedures related to historic treatments, including product manufacturers' written instructions and precautions regarding historic treatment procedures and their effects on materials, components, and vegetation.
l. Embedded work such as flashings and lintels, special details, collection of wastes, protection of occupants and the public, and condition of other construction that affect the Work or will affect the work.

B. Coordination Meetings: Conduct specifically for historic treatment work in conjunction with regularly scheduled progress meetings. Designate a specific part of the meeting agenda to address historic concerns, include updating Historic Treatment Subschedule and any required upcoming Historic Treatment Conferences.
1. Agenda: Review and correct or approve minutes of previous coordination meeting. Review other items of significance that could affect progress of historic treatment work. Include topics for discussion as appropriate to status of Project.

a. Historic Treatment Subschedule: Review progress since last coordination meeting. Determine whether each schedule item is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited with retention of quality; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities are completed within the Contract Time.
b. Schedule Updating: Revise Contractor's Historic Treatment Subschedule after each coordination meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
c. Review present and future needs of each entity present, including review items listed in the "Preliminary Historic Treatment Conference" Paragraph in this article and the following:

1) Interface requirements of historic treatment work with other Project Work.
2) Status of submittals for historic treatment work.
3) Access to historic treatment work.
4) Effectiveness of fire-prevention plan.
5) Quality and work standards of historic treatment work.

1.6 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered or uncovered during the Work, regardless of whether they were previously documented, remain Owner's property.

1. Dismantle and salvage each item or object and protect it from damage, then promptly deliver it to Owner where directed at Project site.
2. Coordinate with Owner's Construction Representative who will establish special procedures for dismantling and salvaging.

1.7 INFORMATIONAL SUBMITTALS

A. Historic Treatment Subschedule:

1. Submit historic treatment subschedule within seven days of date established for commencement of historic treatment work.

B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by Contractor's historic treatment operations. Coordinate with Photographic Documentation requirements in General Conditions.

C. Historic Treatment Program: Submit 30 days before work begins.

D. Fire-Prevention Plan: Submit 30 days before work begins.

1.8 QUALITY ASSURANCE

A. Historic Treatment Specialist Qualifications (Masonry): An experienced firm regularly engaged in historic treatments similar in nature, materials, design, and extent to the work as specified in the Division 4 specifications.

1. Field Supervisor Qualifications: Full-time supervisors experienced in historic treatment work similar in nature, material, design, and extent to that indicated for this Project. Supervisors shall be on site when historic treatment work begins and during its progress. Supervisors shall not be changed during Project except for causes beyond control of the specialist firm.

a. Construct new mockups of required work whenever a supervisor is replaced.

B. Each firm conducting activities that disturb painted surfaces shall be a "Lead-Safe Certified Firm" and use only workers that are trained in lead-safe work practices, as required by the State of Missouri.

C. Historic Treatment Program: Prepare a written plan for historic treatment for whole Project, including each phase or process and protection of surrounding materials during operations. Describe in detail the materials, methods, and equipment to be used for each phase of work, including the direct, qualified supervisor for specific portions of work. Show compliance with indicated methods and procedures specified in this and other Sections. Coordinate this whole-Project historic treatment program with specific requirements of programs required in other historic treatment Sections.

1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions coordinated with continuing on-site operations and other known work in progress.
2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.
3. Indicate methods for
   a. Installation of flooring protection throughout the building to the work area.
   b. Installation of historic surface protections on the building interior and at the fountains.
   c. Plan to completely and carefully protect and work around furnishings remaining in the basement work area.

D. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.

E. Safety and Health Standard: ANSI/ASSE A10.6.

1.9 STORAGE AND HANDLING OF HISTORIC MATERIALS

A. Salvaged Historic Materials:

1. Clean loose dirt and debris from salvaged historic items unless more extensive cleaning is indicated.
2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

B. Historic Materials for Reinstallation:

1. Repair and clean historic items for reuse as indicated.
2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.

C. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after historic treatment and construction work in the vicinity is complete.

D. Storage: Catalog and store historic items in the same condition where they are currently installed.

1. Identify each item with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
2. Secure stored materials to protect from theft.

1.10 FIELD CONDITIONS

A. Size Limitations in Historic Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by 12 inches (300 mm) or more.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from historic treatment procedures.

1. Use only proven protection methods, appropriate to each area and surface being protected.
2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where historic treatment work is being performed.
3. Erect temporary barriers to form and maintain fire-egress routes.
4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during historic treatment work.
5. Contain dust and debris generated by historic treatment work, and prevent it from reaching the public or adjacent surfaces.
6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
8. Provide supplemental sound-control treatment to isolate removal and dismantling work from other areas of the building.

B. Temporary Protection of Historic Materials:

1. Protect existing historic materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
2. Do not attach temporary protection to historic surfaces except as indicated as part of the historic treatment program and approved by Architect.

C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

D. Utility and Communications Services:

1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by historic treatment work before commencing operations.
2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for historic treatment work.
3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Owner immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.

1. Prevent solids such as stone or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from historic treatment work.
2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.2 PROTECTION FROM FIRE

A. Follow fire-prevention plan and the following:

1. Comply with NFPA 241 requirements unless otherwise indicated. Perform duties titled "Owner's Responsibility for Fire Protection."
2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.

    a. If combustible material cannot be removed, provide fire blankets to cover such materials.

3. Prohibit smoking by all persons within Project work and staging areas.

B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:

1. Obtain Owner's approval for operations involving use of open-flame or welding or other high-heat equipment. Notify Owner at least 24 hours before each occurrence, indicating location of such work.
2. As far as practicable, restrict heat-generating equipment to shop areas or outside the building.
3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that area is safe.
4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:

    a. Train each fire watch in proper operation of fire-control equipment and alarms.
    b. Prohibit fire-watch personnel from other work that would distract from fire-watch duties.
    c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
    d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
    e. Maintain fire-watch personnel at each area of Project site until two hours after conclusion of daily work.

C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for type of fire risk in each work area. Ensure that nearby personnel and fire-watch personnel are trained in fire-extinguisher and blanket use.

3.3 PROTECTION DURING APPLICATION OF CHEMICALS

A. Provide complete enclosure during cleaning and media blasting to prevent debris and dust from becoming airborne outside of the immediate fountain area, per Section 015000.

B. Protect motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.

C. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in historic treatment program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.

D. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.

E. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.

F. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

3.4 GENERAL HISTORIC TREATMENT

A. Have historic treatment work performed only by qualified historic treatment specialists.

B. Ensure that supervisory personnel are present when historic treatment work begins and during its progress.

C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs or video recordings.

D. Perform regular, but no less than daily, inspections of Project site as the Work progresses to detect hazards resulting from historic treatment procedures.

E. Follow the procedures in subparagraphs below and procedures approved in historic treatment program unless otherwise indicated:

1. Retain as much existing material as possible; repair and consolidate rather than replace.
2. Use additional material or structure to reinforce, strengthen, prop, tie, and support existing material or structure.
3. Use reversible processes wherever possible.
4. Use historically accurate repair and replacement materials and techniques unless otherwise indicated.

5. Record existing work before each procedure (preconstruction) and progress during the work with digital preconstruction documentation photographs or video recordings.

F. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect.

G. Where missing features are indicated to be repaired or replaced, provide work with appearance based on accurate duplications rather than on conjecture, subject to approval of Architect.

H. Where work requires existing features to be removed or dismantled and reinstalled, perform these operations without damage to the material itself, to adjacent materials, or to the substrate.

I. Identify new and replacement materials and features with permanent marks hidden in the completed Work to distinguish them from original materials. Record a legend of identification marks and the locations of the items on record Drawings.

END OF SECTION 013591

SECTION 015000 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract including General and Supplementary Conditions, Bid Form, and other Division 1 Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section includes requirements for construction facilities and temporary controls including temporary utilities, support facilities, security, and protection.

B. Temporary utilities include, but are not limited to, the following:

1. Water service and distribution
2. Temporary electric power and light
3. Temporary heat
4. Ventilation
5. Telephone service
6. Sanitary facilities, including drinking water
7. Storm and sanitary sewer

C. Support facilities include, but are not limited to, the following:

1. Field offices and storage sheds
2. Temporary roads and paving
3. Dewatering facilities and drains
4. Temporary enclosures
5. Hoists and temporary elevator use
6. Temporary project identification signs and bulletin boards
7. Waste disposal services
8. Rodent and pest control
9. Construction aids and miscellaneous services and facilities

D. Security and protection facilities include, but are not limited to, to following:

1. Temporary fire protection
2. Barricades, warning signs, and lights
3. Sidewalk bridge or enclosure fence for the site
4. Environmental protection

1.3 SUBMITTALS

A. Temporary Utilities: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.

B. Implementation and Termination Schedule: Within (15) days of the date established for commencement of the Work, submit a schedule indicating implementation and termination of each temporary utility.

1.4 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations including, but not limited to, the following:

1. Building code requirements
2. Health and safety regulations
3. Utility company regulations
4. Police, fire department, and rescue squad rules
5. Environmental protection regulations

B. Standards: Comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations". ANSI A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities".

1. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 "National Electric Code".

C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist onsite.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials. If acceptable to the Designer, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.

B. Lumber and Plywood: Comply with requirements in Division 6 Section "Rough Carpentry".

1. For signs and directory boards, provide exterior-type, Grade B-B high-density concrete form overlay plywood of sized and thicknesses indicated.

2. For fences and vision barriers, provide minimum 3/9" (9.5mm) thick exterior plywood.

3. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8" (16mm) thick exterior plywood.

C. Paint: Comply with requirements of Division 9 Section "Painting".

1. For sign panels and applying graphics, provide exterior-grade alkyd gloss enamel over exterior primer.

D. Water: Provide potable water approved by local health authorities.

E. Open-Mesh Fencing: Provide 0.120" (3mm) thick, galvanized 2" (50mm) chainlink fabric fencing 6' (2m) high with galvanized steel pipe posts, 1½" (38mm) ID for line posts and 2½" (64mm) ID for corner posts.

2.2 EQUIPMENT

A. General: Provide new equipment. If acceptable to the Designer, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.

B. Water Hoses: Provide ¾" (19mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100' (30m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

C. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110 to 120V plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.

D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage rating.

E. Provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers, or a combination of extinguishers of NFPA-recommended classes for the exposures.

1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each Facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.

1. Arrange with company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services.

2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.

3. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.

4. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Designer. Neither the Owner nor Designer will accept cost or use charges as a basis of claims for Change Order.

B. Temporary Water Service: The Owner will provide water for construction purposes from the existing building system. All required temporary extensions shall be provided and removed by the Contractor. Connection points and methods of connection shall be designated and approved by the Construction Representative.

C. Temporary Electric Power Service: The Owner will provide electric power for construction lighting and power tools. Contractors using such services shall pay all costs of temporary services, circuits, outlet, extensions, etc.

D. Temporary Toilets: The Owner will provide toilets and associated facilities within the building. All construction personnel will be allowed access only to those specific facilities designated by the Construction Representative.

E. Wash Facilities: The Owner will provide wash facilities within the building. All construction personnel will be allowed access only to those specific facilities designated by the Construction Representative.

F. Drinking-Water Facilities: The Owner will provide drinking water facilities within the building. All construction personnel will be allowed access only to those specific facilities designated by the Construction Representative.

G. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

3.3 SUPPORT FACILITIES INSTALLATION

A. Storage Facilities: Limited areas for storage of building materials are available onsite. Available storage areas are shown on the drawings. The Contractor shall provide his own security. Specific locations for storage and craning operations will be discussed at the Pre-Bid Meeting and the Pre-Construction Meeting.

B. Storage Facilities: No areas for storage of building materials can be made available onsite. The Contractor shall provide for all storage offsite. All off-site storage locations shall be approved by the Construction Representative. The Contractor shall provide his

own security as he finds necessary. The Construction Representative shall have access to the off-site storage at all times.

C. Temporary Paving: Construct and maintain temporary roads and paving to support the indicated loading adequately and to withstand exposure to traffic during the construction period. Locate temporary paving for roads, storage areas, and parking where the same permanent facilities will be located. Review proposed modifications to permanent paving with the Designer.

1. Coordinate temporary paving development with subgrade grading, compaction, installation and stabilization of subbase, and installation of base and finish courses of permanent paving.

2. Install temporary paving to minimize the need to rework the installations and to result in permanent roads and paved areas without damage or deterioration when occupied by the Owner.

3. Delay installation of the final course of permanent asphalt concrete paving until immediately before Substantial Completion. Coordinate with weather conditions to avoid unsatisfactory results.

4. Extend temporary paving in and around the construction area as necessary to accommodate delivery and storage of materials, equipment usage, administration, and supervision.

D. Construction Parking: Contractors must be prepared to discuss their storage and parking needs at the Pre-Bid Meeting. Parking for construction personnel cannot be provided onsite. All parking will be offsite. The Contractor will have to park on the street, in city-owned lots, or in commercial lots. Under no circumstances will any vehicle be parked in a fire lane. Parking on lawns shall be prohibited.

E. Temporary Lifts and Hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered “tools and equipment” and not temporary facilities.

F. Temporary Elevator Use: The Owner will allow use of elevators within the building. All construction personnel will be allowed access only to those specific elevators designated by the Construction Representative.

G. Project Identification and Temporary Signs: Prepare project identification and other signs of size indicated. Install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative-treated wood or steel. Do not permit installation of unauthorized signs.

1. Project Identification Signs: Engage an experienced sign painter to apply graphics. Comply with details indicated.

2. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.

H. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than seven (7) days during normal weather or three (3) days when the temperature is expected to rise above 80°F (27°C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting including flashing red or amber lights.

B. Enclosure Fence: Before excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated, or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering the site, except by the entrance gates.

1. Provide open-mesh, chainlink fencing with posts set in a compacted mixture of gravel and earth.

C. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

D. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.5 OPERATION, TERMINATION AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

1. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

C. Termination and Removal: Unless the Designer requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the Contractor's property. The Owner reserves the right to take possession of project identification signs.

2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth

of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at the temporary entrances as required by the governing authority.

3. At Substantial Completion, clean and renovate permanent facilities used during the construction period including, but not limited to, the following:

   a. Replace significantly worn parts and parts subject to unusual operating conditions.

END OF SECTION 015000

SECTION 017000 - GENERAL REQUIREMENTS FOR FOUNTAIN SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Responsibility of cost of pool fill water and pool chemicals.

B. Water loss testing.

C. Demonstration and instruction of Owner personnel.

D. Operation.

E. Winterization requirements.

1.2 RELATED SECTIONS

A. Division 1 - General Requirements.

PART 2 PRODUCTS

2.1 POOL FILL WATER AND POOL CHEMICALS

A. Cost of Fill Water: By Owner.

B. Cost of chemicals required for start-up and operation: By Owner.

PART 3 EXECUTION

3.1 WATER LOSS TESTING

A. After the system has been filled and is operational, perform a water loss test on all water holding structures and piping systems. All testing shall be performed in company with the Owner and/or Engineer.

B. Testing procedures shall be as follows:

1. Run the pump system under normal operating conditions.

2. Where exposed for viewing, check all water holding structures and piping systems for visible leaks. Report any leaks along with recommended repair procedures to the Engineer for review and approval. Upon approval, make the necessary repairs.

3. Turn off all water make-up systems.

4. Place a five-gallon bucket, partially filled with water to offset it's buoyancy, within the fountain basin such that the rim is above water level (this could be placed on a step, placed on or supported from the pool bottom, or somehow supported from above).

5. Fill the bucket with water to the exact level of the surrounding basin water. (The purpose of the water filled bucket is to measure losses due to evaporation. Water loss in the pool greater than that observed in the bucket indicates losses in excess of evaporation and so it can be concluded that leakage exists.)

6. Mark the inside and outside of the bucket with a permanent marker at the water level.

7. Run the pump system under normal operating conditions for a 24-hour period with the bucket in place.

8. Compare the water level in the bucket with the basin water level. Report these values to the Engineer. If the water level in the bucket and the basin water level are the same, then the test passed. If the basin water level is significantly below the level of the water in the bucket, the test failed and a leak is present.

C. If testing indicates water loss or leakage, locate the source of water loss and report the source(s) and recommended repair procedures to the Engineer for review and approval. Once the repair procedures are approved, make the necessary repairs and perform the water loss testing procedures again.

3.2 DEMONSTRATION AND INSTRUCTION

A. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

B. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.

3.3 OPERATION

A. For a period of 15 days after substantial completion, operate the fountain pump system, filtration, and chemical feed systems.

B. Maintain appropriate operating records.

3.4 WINTERIZATION

A. Provide a qualified person who is knowledgeable about the Project to perform winterization and instruction of owner personnel.

B. Winterize the facility for the first season and instruct the Owner's personnel on the winterization of all equipment and piping systems. Provide written instructions on winterizing all facilities, including pools and bathhouse, and provide training of staff on winterizing procedures.

END OF SECTION

SECTION 017400 – CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract including General and Supplementary Conditions, Bid Form, and other Division 1 Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for cleaning during the Project.

B. Environmental Requirements: Conduct cleaning and waste-disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and anti-pollution regulations.

1. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

2. Burning or burying of debris, rubbish, or other waste material on the premises is not permitted.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by the manufacturer or fabricator for 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 PROGRESS CLEANING

A. General

1. Retain all stored items in an orderly arrangement allowing maximum access, not impending drainage or traffic, and providing the required protection of materials.

2. Do not allow the accumulation of scrap, debris, waste material, and other items not required for construction of this Work.

3. At least <once><twice> each month, and more often if necessary, completely remove all scrap, debris, and waste material from the jobsite.

4. Provide adequate storage for all items awaiting removal from the jobsite, observing all requirements for fire protection and protection of the ecology.

B. Site

1. Daily, inspect the site and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.

2. Weekly, inspect all arrangements of materials stored onsite. Re-stack, tidy, or otherwise service all material arrangements.

3. Maintain the site in a neat and orderly condition at all times.

C. Structures

1. Daily, inspect the structures and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.

2. Weekly, sweep all interior spaces clean. "Clean" for the purposes of this paragraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and handheld broom.

3. In preparation for installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using all equipment and materials required to achieve the required cleanliness.

4. Following the installation of finish floor materials, clean the finish floor daily while work is being performed in the space in which finish materials have been installed. "Clean" for the purposes of this subparagraph, shall be interpreted as meaning free from all foreign material which, in the opinion of the Construction Representative, may be injurious to the finish of the finish floor material.

3.2 FINAL CLEANING

A. General: Provide final cleaning operations when indicated. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for the entire Project or a portion of the Project.

1. Clean the Project Site, yard and grounds, in areas disturbed by construction activities including landscape development areas, of rubbish, waste material, litter, and foreign substances.

2. Sweep paved areas broom clean. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

3. Remove petrochemical spills, stains, and other foreign deposits.

4. Remove tools, construction equipment, machinery, and surplus material from the site.

5. Remove snow and ice to provide safe access to the building.

6. 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.

7. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

8. Broom clean concrete floors in unoccupied spaces.

9. Vacuum clean carpet and similar soft surfaces removing debris and excess nap. Shampoo, if required.

10. Clean transparent material, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-

obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

11. Remove labels that are not permanent labels.

12. 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.

13. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

14. Clean plumbing fixtures to a sanitary condition free of stains, including stains resulting from water exposure.

15. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

16. Clean ducts, blowers, and coils if units were operated without filters during construction

17. Clean food-service equipment to a sanitary condition, ready and acceptable for its intended use.

18. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs and defective and noisy starters in fluorescent and mercury vapor fixtures.

19. Leave the Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid the Project of rodents, insects, and other pests. Comply with regulations of local authorities.

D. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.

E. Compliances: Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the site and dispose of lawfully.

1. Where extra materials of value remain after Final Acceptance by the Owner, they become the Owner's property.

END OF SECTION 017400

SECTION 017900 - DEMONSTRATION AND TRAINING

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 administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and training video recordings.

1.3 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

B. Attendance Record: For each training module, submit list of participants and length of instruction time.

C. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.4 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings and Documentation: Submit two copies within seven days of end of each training module.

1. Identification: On each copy, provide an applied label with the following information:

a. Name of Project.
b. Name and address of videographer.
c. Name of Architect.
d. Name of Construction Manager.
e. Name of Contractor.
f. Date of video recording.

2. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
3. At completion of training, submit complete training manual(s) for Owner's use in PDF electronic file format on compact disc.
4. Provide laminated instructions and mount to wall adjacent to fountain mechanical equipment.

1.5 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative experienced in operation and maintenance procedures and training.

C. Pre-instruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Coordination". Review methods and procedures related to demonstration and training including, but not limited to, the following:

1. Inspect and discuss locations and other facilities required for instruction.
2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.6 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

a. System, subsystem, and equipment descriptions.
b. Performance and design criteria if Contractor is delegated design responsibility.
c. Operating standards.
d. Regulatory requirements.
e. Equipment function.
f. Operating characteristics.
g. Limiting conditions.

h. Performance curves.

2. Documentation: Review the following items in detail:

   a. Emergency manuals.
   b. Operations manuals.
   c. Maintenance manuals.
   d. Project record documents.
   e. Identification systems.
   f. Warranties and bonds.
   g. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

   a. Instructions on meaning of warnings, trouble indications, and error messages.
   b. Instructions on stopping.
   c. Shutdown instructions for each type of emergency.
   d. Operating instructions for conditions outside of normal operating limits.
   e. Sequences for electric or electronic systems.
   f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions, including but not limited to
      1) Normal filtering and operating sequences
      2) Filter cleaning
      3) Water treatment and balance
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Instructions on stopping.
   h. Normal shutdown instructions.
   i. Operating procedures for emergencies.
   j. Operating procedures for system, subsystem, or equipment failure.
   k. Seasonal and weekend operating instructions.
   l. Required sequences for electric or electronic systems.
   m. Special operating instructions and procedures.

5. Adjustments: Include the following:

   a. Alignments.
   b. Checking adjustments.
   c. Noise and vibration adjustments.
   d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:

   a. Diagnostic instructions.
   b. Test and inspection procedures.

7. Maintenance: Include the following:

   a. Inspection procedures.

b. Types of cleaning agents to be used and methods of cleaning.
c. List of cleaning agents and methods of cleaning detrimental to product.
d. Procedures for routine cleaning
e. Procedures for preventive maintenance.
f. Procedures for routine maintenance.
g. Instruction on use of special tools.

8. Repairs: Include the following:

a. Diagnosis instructions.
b. Repair instructions.
c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
d. Instructions for identifying parts and components.
e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 007213 "General Conditions".

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Contractor to furnish an instructor to describe system, operational requirements, criteria, and regulatory requirements.
2. Engineer will assist Contractor in describing basis of design and regulatory requirements.
3. Owner will furnish an instructor to describe Owner's operational philosophy.
4. Owner will furnish Contractor with names and positions of participants.

B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner with at least seven days' advance notice.

C. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

D. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.

1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Video: Provide minimum 640 x 480 video resolution converted to format file type acceptable to Owner, on electronic media.

1. Electronic Media: Read-only format compact disc acceptable to Owner, with commercial-grade graphic label.
2. File Hierarchy: Organize folder structure and file locations according to project manual table of contents. Provide complete screen-based menu.
3. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project specifications.
4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training DVD that describes the following for each Contractor involved on the Project, arranged according to Project table of contents:

a. Name of Contractor/Installer.
b. Business address.
c. Business phone number.
d. Point of contact.
e. E-mail address.

C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.

1. Film training session(s) in segments not to exceed 15 minutes.

a. Produce segments to present a single significant piece of equipment per segment.
b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.

D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.

1. Furnish additional portable lighting as required.

E. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.

F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.

G. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

END OF SECTION 017900

SECTION 024100 - DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.

B. Selective demolition of built site elements.

C. Selective demolition of building elements for alteration purposes.

D. Abandonment and removal of existing utilities and utility structures.

1.2 RELATED REQUIREMENTS

A. DIVISION 1 - GENERAL REQUIREMENTS

1.3 REFERENCE STANDARDS

1.4 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.

1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.

2. Identify demolition firm and submit qualifications.

C. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.1 SCOPE

A. Remove other items indicated, for salvage and relocation.

B. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 312200.

C. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

3.2 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Obtain required permits.

2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.

3. Provide, erect, and maintain temporary barriers and security devices.

4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.

5. Do not close or obstruct roadways or sidewalks without permit.

6. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Protect existing structures and other elements that are not to be removed.

1. Provide bracing and shoring.

2. Prevent movement or settlement of adjacent structures.

3. Stop work immediately if adjacent structures appear to be in danger.

3.3 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.4 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.

1. Verify that construction and utility arrangements are as indicated.

2. Report discrepancies to Engineer before disturbing existing installation.

3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Remove existing work as indicated and as required to accomplish new work.

1. Remove items indicated on drawings.

C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.

1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.

2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.

3. Verify that abandoned services serve only abandoned facilities before removal.

4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

D. Protect existing work to remain.

1. Prevent movement of structure; provide shoring and bracing if necessary.

2. Perform cutting to accomplish removals neatly and as specified for cutting new work.

3. Repair adjacent construction and finishes damaged during removal work.

4. Patch as specified for patching new work.

3.5 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 024100

SECTION 024296 - HISTORIC REMOVAL AND DISMANTLING

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 historic treatment procedures in the form of special types of selective demolition work for historic spaces, areas, rooms, and surfaces and the following specific work:

1. Removal and dismantling of indicated portions of building or structure and debris hauling.
2. Removal and dismantling of indicated site elements and debris hauling.
3. Salvage of existing items to be reused or recycled.

B. Related Requirements:

1. Section 013591 "Historic Treatment Procedures" for general historic treatment requirements.

1.3 DEFINITIONS

A. Dismantle: To disassemble or detach a historic item from a surface, or a nonhistoric item from a historic surface, using gentle methods and equipment to prevent damage to historic items and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

B. Existing to Remain: Existing items that are not to be removed or dismantled, except to the degree indicated for performing required Work.

C. Remove: To take down or detach a nonhistoric item located within a historic space, area, or room, using methods and equipment to prevent damage to historic items and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

D. Preserve or Retain: To keep existing items that are not to be removed or dismantled.

E. Salvage: To protect removed or dismantled items and deliver them to Owner ready for reuse.

1.4 PRECONSTRUCTION MEETINGS

A. Preconstruction Conference(s): Conduct conference(s) at Project site.

1. Review minutes of Preliminary Historic Treatment Conference that pertain to removal and dismantling procedures and protection of historic areas and surfaces.
2. Review list of items indicated to be salvaged.
3. Verify qualifications of personnel assigned to perform removal and dismantling.
4. Inspect and discuss condition of each construction type to be removed or dismantled.

5. Review requirements of other work that depends on condition of substrates exposed by removal and dismantling work.
6. Review methods and procedures related to removal and dismantling work, including, but not limited to, the following:
    a. Historic removal and dismantling specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
    b. Materials, material application, sequencing, tolerances, and required clearances.
    c. Fire prevention.
    d. Coordination with building occupants.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For historic mason responsible for removal and dismantling specialist and historic removal and dismantling specialist's field supervisors.

B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by Contractor's removal and dismantling operations.

C. Removal and Dismantling Historic Treatment Program (Include in Section 013591 Historic Treatment Program): Submit 15 days before work begins.

D. List of Items Indicated to Be Salvaged: Prepare a list of items indicated on Drawings to be salvaged for Owner's use or for reinstallation. Submit 15 days before preconstruction conference.

E. Inventory of Salvaged Items: After removal or dismantling work is complete, submit a list of items that have been salvaged.

1. Include item description, item condition, number of items if more than one of a type, and tag number. Include photo of item in original location.
2. As work proceeds, include on the inventory items that were indicated to be salvaged and items of historic importance discovered during the work. Document reasons, if any, why an item indicated to be salvaged was not salvaged.

1.6 QUALITY ASSURANCE

A. Historic Removal and Dismantling Specialist Qualifications: A qualified historic masonry treatment specialist. General selective demolition experience is insufficient experience for historic removal and dismantling work.

B. Removal and Dismantling Historic Treatment Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of removal and dismantling work, including protection of surrounding and substrate materials and Project site.

1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.
2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.

C. Mockups: Prepare mockups of specific historic removal and dismantling procedures specified in this Section to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

D. Regulatory Requirements: Comply with notification regulations of authorities having jurisdiction before beginning removal and dismantling work. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.7 FIELD CONDITIONS

A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.

C. Hazardous Materials: Hazardous materials are present in construction affected by removal and dismantling work.

1. Hazardous material remediation is specified elsewhere in the Contract Documents.
2. Do not disturb hazardous materials or items suspected of containing hazardous materials, except under procedures specified elsewhere in the Contract Documents.
3. If unanticipated asbestos is suspected, stop work in the area of potential hazard, shut off fans and other air handlers ventilating the area, and rope off area until the questionable material is identified. Resume work in the area of concern after safe working conditions are verified.

D. Storage or sale of removed or dismantled items on-site is not permitted unless otherwise indicated.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 HISTORIC REMOVAL AND DISMANTLING EQUIPMENT

A. Dismantling Equipment: Use manual, hand-held tools, except as follows or otherwise approved by Architect on a case-by-case basis:

1. Hand-held power tools and cutting torches are permitted only as submitted in the historic treatment program. They must be adjustable so as to penetrate or cut only the thickness of material being removed.
2. Pry bars more than 18 inches (450 mm) long and hammers weighing more than 2 lb (0.9 kg) are not permitted for dismantling work.

3.2 EXAMINATION

A. Preparation for Removal and Dismantling: Examine construction to be removed or dismantled to determine best methods to safely and effectively perform removal and dismantling work. Examine adjacent work to determine what protective measures are necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed or dismantled and location of utilities and services to remain that may be hidden by construction that is to be removed or dismantled.

1. Verify that affected utilities are disconnected and capped.
2. Inventory and record the condition of items to be removed and dismantled for reinstallation or salvage. Enter this information on the submittal of inventory of salvaged items.
3. Before removal or dismantling of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

B. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs and preconstruction video recordings.

1. Comply with requirements specified in Section 013233 "Photographic Documentation."

C. Perform surveys as the Work progresses to detect hazards resulting from historic removal and dismantling procedures.

3.3 HISTORIC REMOVAL AND DISMANTLING

A. General: Have removal and dismantling work performed by a qualified historic removal and dismantling specialist. Ensure that historic removal and dismantling specialist's field supervisors are present when removal and dismantling work begins and during its progress.

B. Perform work according to the historic treatment program and approved mockup(s).

1. Perform removal and dismantling to the limits indicated.
2. Provide supports or reinforcement for existing construction that becomes temporarily weakened by removal and dismantling work, until the Project Work is completed unless otherwise indicated.
3. Perform cutting by hand or with small power tools wherever possible. Cut holes and slots neatly to size required, with minimum disturbance of adjacent work.
4. Do not operate air compressors inside building unless approved by Architect in each case.
5. Do not drill or cut columns, beams, joints, girders, structural slabs, or other structural supporting elements, without having Contractor's professional engineer's written approval for each location before such work is begun.
6. Dispose of removed and dismantled items off-site unless indicated to be salvaged or reinstalled.

C. Water-Mist Sprinkling: Use water-mist sprinkling and other wet methods to control dust only with adequate, approved procedures and equipment according to the historic treatment program to ensure that such water does not create a hazard or adversely affect other building areas or materials.

D. Unacceptable Equipment: Keep equipment that is not permitted for historic removal or dismantling work away from the vicinity where such work is being performed.

E. Removing and Dismantling Items on or Near Historic Surfaces:

1. Use only dismantling equipment and procedures within 12 inches (300 mm) of historic surface. Do not use pry bars. Protect historic surface from contact with or damage by tools.
2. Unfasten items in the opposite order from which they were installed.
3. Support each item as it becomes loosened to prevent stress and damage to the historic surface.
4. Dismantle anchorages.

F. Masonry:

1. Remove masonry carefully, and erect temporary bracing and supports as needed to fully support and prevent collapse or breakage of materials being removed.
2. Stop removal work and immediately inform Owner if any structural elements above or adjacent to the work show signs of distress or dislocation during any phase of removal work.
3. Remove individual, full stone units.
4. During removal, maintain the stability of the remaining wall. Notify Architect of the condition of temporary bracing for wall if work is temporarily stopped during the wall's removal.

G. Anchorages:

1. Remove anchorages associated with removed items.
2. Dismantle anchorages associated with dismantled items.
3. In nonhistoric surfaces, patch holes created by anchorage removal or dismantling according to the requirements for new work.
4. In historic surfaces, patch or repair holes created by anchorage removal or dismantling according to Section that is specific to the historic surface being patched.

END OF SECTION 024296

SECTION 033005 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Concrete for water-containing structures, sidewalks, decks, building structures, drives, and paving.

B. Concrete formwork.

C. Elevated concrete slabs.

D. Floors and slabs on grade.

E. Concrete pavements and curb and gutters.

F. Concrete reinforcement.

G. Joint devices associated with concrete work.

H. Miscellaneous concrete elements, including equipment pads, light pole bases, thrust blocks, and manholes.

I. Concrete curing.

1.2 REFERENCE STANDARDS

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; American Concrete Institute International (except as modified by more stringent requirements in the project specifications and/or drawings); 2010.

B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2002).

C. ACI 224R - Control of Cracking in Concrete Structures; 2001.

D. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2010.

E. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (errata 2007).

F. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.

G. ACI 304.2R - Placing Concrete by Pumping Methods; 1991.

H. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).

I. ACI 309R - Guide for Consolidation of Concrete; American Concrete Institute International; 1987.

J. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2011.

K. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2012.

L. ASTM C 31 - Making and Curing Concrete Test Specimens in the Field; 2000.

M. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2011a.

N. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2012.

O. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2010a.

P. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.

Q. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2010b.

R. ASTM C 231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method; 1997.

S. ASTM C 1064 - Test Method for Temperature of Freshly Mixed Portland Cement Concrete; 1999.

T. PS 1 - Construction and Industrial Plywood; National Institute of Standards and Technology (Department of Commerce); 1995.

1.3 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Product Data:

1. Submit data on formwork, reinforcing, and reinforcing accessories.

2. Submit data on all concrete materials including cement and fine and coarse aggregates. Testing shall be completed by an independent testing agency and shall be less than 12 months old. The costs for material tests shall be paid for by the Contractor.

3. Submit data on all admixtures and concrete accessories.

4. Submit concrete mix design.

C. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.

D. Fabrication details of the tool proposed to be used to form the top pool gutter wall and lip including written instructions, descriptions, and/or illustrations showing how the tool will be used and how the vertical and horizontal dimensions will be controlled.

1.4 DESIGN OF FORMWORK

A. Design and engineering of formwork, as well as its construction shall be the responsibility of the CONTRACTOR and shall comply with chapters 2 and 3 of ACI-347, and applicable requirements of the controlling local building code.

1.5 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

B. Acquire cement from same source and aggregate from same source for entire project.

C. Cold Weather Concreting: Cold weather concreting shall comply with ACI 306R.

1. The temperature of concrete at the time of placement shall be as follows:

a. Section size (minimum dimension) less than 12 inches: 55 to 75 degrees F.

b. Section size (minimum dimension) 12 to 36 inches: 50 to 70 degrees F.

2. The concrete temperature shall be maintained above the minimum identified above for a period of 6 days after placement.

D. Hot Weather Concreting: Except as modified herein, hot weather concreting shall comply with ACI 305R.

1. At air temperatures of 90 degrees F or above, concrete shall be kept as cool as possible during placement and curing. The temperature of the concrete when placed in the work shall not exceed 90 degrees F.

2. Plastic shrinkage cracking due to rapid evaporation of moisture shall be prevented. Concrete shall not be placed when the evaporation rate (actual or anticipated) equals or exceeds 0.2 pound per square foot per hour, as determined by Figure 2.1.5 in ACI 305R.

E. Concrete materials shall be selected and concrete shall be proportioned, handled, placed, and cured in a manner that will minimize shrinkage and cracking in accordance with Chapters 3 and 8 of ACI 224R. Concrete temperatures shall be controlled both before and after placement to minimize cracking. Any rise in concrete temperature caused by environmental conditions that will be conductive to excessive shrinkage shall be controlled with blankets or other acceptable means of insulation.

1.6 MOCK-UP

A. Construct a mock-up panel for each type of concrete surface finish for review and acceptance by Engineer.

1. Panel Size: Sufficient to illustrate finish required.

2. Mock-up panels shall include, but not necessary limited to, illustrating the following:

a. Pool bottom including roughened construction joint, keyway placement, horizontal and vertical waterstop placement, placement of reinforcing, and broom finish.

b. Pool deck and sidewalk broom finish.

c. Pool bathhouse and filter building floor finish.

d. Pool gutter wall including reinforcing placement, waterstop placement, horizontal and vertical control methods for construction of the top of gutter, repair of tie holes, and grout cleaned finish including sandblasting and rubbing.

B. Accepted mock-up panel is considered basis of quality for the finished work. Keep mock-up exposed to view for duration of concrete work.

C. Mock-up shall not remain as part of the Work.

PART 2 PRODUCTS

2.1 FORMWORK

A. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.

2. Prefabricated: Simplex "Industrial Steel Frame Forms", Symons "Steel Ply", or Universal "Uni-form".

3. Plywood: Product Standard PS 1, waterproof, resin-bonded, exterior type Douglas fir, Panel Grade Designation B-B (concrete form), Class I.

4. Fiberboard: ANSI/AHA A135.4, Class 1, tempered, water-resistant, concrete form hardboard.

5. Lumber: Straight, uniform width and thickness, and free from knots, offsets, holes, dents, and other surface defects.

6. Chamfer Strips: Clear white pine, surface against concrete planed or Vinylex Corporation chamfer strips made from plastic material.

7. Radius Formers: Vinylex Corporation radius formers made from plastic material.

8. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.

   a. Burke "Spectrum Release Agent", L&M Chemical "Debond", Master Builders "Pro Cote", Nox-Crete "Chembeton", or Symons "Thrift Kote".

9. Form Tie:

   a. Walls adjacent to fill or air - Cone snap type, with 1 inch long cone, that will leave no metal within 1 inches of concrete surface.

   b. Walls adjacent to water - Cone snap type, with 1-1/2 inch long cone and waterproofing washer, that will leave no metal within 1-1/2 inches of concrete surface.

2.2 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M Grade 60 (420).

1. Deformed billet-steel bars. Use plain billet-steel bars only where indicated on the drawings.

2. Finish: Unfinished, unless otherwise indicated.

B. Reinforcement Accessories:

1. Tie Wire: Annealed, minimum 16 gage.

2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

3. Precast Concrete Reinforcement Supports: Concrete supports that are not less than 4 inches square having a compressive strength equal to or greater than the specified compressive strength of the concrete being placed may be used for supporting reinforcing from the ground per ACI 301.

4. Provide stainless steel or all-plastic (no plastic-tipped components allowed) components for placement within 1-1/2 inches of surfaces exposed to weather or water.

2.3 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I - Normal Portland type.

1. Acquire all cement for entire project from same source.

B. Fly Ash: Shall not be allowed.

C. Fine and Coarse Aggregates: ASTM C 33, unless modified herein.

1. Acquire all aggregates for entire project from same source.

2. Fine Aggregate:

a. Clean natural sand. Artificial or manufactured sand will not be acceptable.

b. Shall not contain any materials that are deleteriously reactive with the alkalines in the cement.

c. Sulfate Soundness Test: ASTM C 88.

1) Fine aggregate subjected to five cycles of the soundness test shall have a weighted average loss not greater than 10 percent when sodium sulfate is used or 15 percent when magnesium sulfate is used.

d. Organic Impurities Test: ASTM C 40.

1) Fine aggregate shall be free of injurious amounts of organic impurities.

2) Aggregates subjected to the test for organic impurities and producing a color darker than the standard shall be rejected.

e. Limits for Deleterious Substances:

1) Clay lumps and friable particle, ASTM C 142: 3.0 percent.

2) Materials finer than No. 200 sieve, ASTM C 117: 5.0 percent.

3) Coal and lignite, ASTM C 123: 0.2 percent.

f. Sieve Analysis (percent passing), ASTM C 136:

1) 3/8 inch: 100

2) No. 4: 95 to 100

3) No. 8: 80 to 100

4) No. 16: 50 to 85

5) No. 30: 25 to 60

6) No. 50: 15 to 30

7) No. 100: 3 to 10

g. Fineness Modulus, ASTM C 136: Shall not be less than 2.3 nor more than 3.1.

3. Coarse Aggregate:

   a. Crushed rock, washed gravel, or other inert granular material, having ASTM C 33 Class Designation 5S and as modified herein.

   b. Shall not contain any materials that are deleteriously reactive with the alkalies in the cement.

   c. Upper Limits for Deleterious Substances and Physical Property Requirements:

      1) Clay lumps and friable particles, ASTM C 142: 2.0 percent.

      2) Chert (less than 2.40 sp gr SSD), ASTM C 123: 0.5 percent.

      3) Material finer than No. 200 sieve, ASTM C 117: 1.0 percent.

      4) Coal and lignite, ASTM C 123: 0.2 percent.

      5) Abrasion, ASTM C 131: 50.

      6) Soundness Test, ASTM C 88:

         (a) Magnesium sulfate (5 cycles): 18 percent.

         (b) Sodium sulfate: 12 percent.

   d. Grading Requirements:

      1) Type A Concrete Mix Design: ASTM C 33, Table 2 Size Number: 67, which has the following gradation (percent passing):

         (a) 1 inch: 100

         (b) 3/4 inch: 90 to 100

         (c) 3/8 inch: 20 to 55

         (d) No. 4: 0 to 10

         (e) No. 8: 0 to 5

      2) Type B Concrete Mix Design: ASTM C 33, Table 2 Size Number: 8, which has the following gradation (percent passing):

         (a) 1/2 inch: 100

         (b) 3/8 inch: 85 to 100

         (c) No. 4: 10 to 30

         (d) No. 8: 0 to 10

(e) No. 16: 0 to 5

4. Percentage of Fine to Total Aggregates: The ratio of fine to total aggregates, based on solid volumes (not weights), multiplied by 100 shall be based upon the following coarse aggregate sizes:

a. For 1 inch maximum coarse aggregate size: Ratio of fine to total aggregates is 30% to 46%.

b. For 1/2 inch maximum coarse aggregate size: Ratio of fine to total aggregates is 40% to 55%.

D. Water: Clean and not detrimental to concrete.

2.4 CHEMICAL ADMIXTURES

A. No calcium chloride or admixture containing chloride from sources other than impurities in admixture ingredients will be acceptable. Admixtures classified as Class 1 or Class 2 in ACI 212R or containing any lignosulfonic acids ("lignins") or their salts will not be acceptable.

B. Air Entrainment Admixture: ASTM C 260.

1. Products:

a. Grace "Daravair" or "Darex".

b. BASF "MB-VR" or "MB-AE 90".

c. Sika Chemical "AER".

2. An air-entraining admixture shall be included in all concrete.

C. Chemical Admixtures: ASTM C 494/C 494M, Type A - Water Reducing, Type B - Retarding, and Type D - Water Reducing and Retarding.

1. Provide products manufactured by Grace, BASF, or Sika.

2. A water reducing admixture shall be included in all concrete.

3. A retarding admixture may be used only when approved by Engineer.

2.5 BONDING AND JOINTING PRODUCTS

A. Joint Filler: As specified in Section 07 90 10.

B. Backer Rod: As specified in Section 07 90 10.

C. Sealant and Primer: As specified in Section 079010.

2.6 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.

1. For trial mixtures method, employ independent testing agency acceptable to Engineer for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.

D. Normal Weight Concrete, Type A:

1. Type A concrete shall be used at all locations unless noted otherwise.

2. Compressive Strength: The minimum acceptable compressive strength, when tested in accordance with ASTM C 39, shall be as follows:

a. 7 days: 3,000 psi.

b. 28 days: 4,000 psi.

3. Cement Content: Minimum 530 lb per cubic yard.

4. Water-Cement Ratio: Maximum 0.462 by weight.

5. Total Air Content: 6 percent plus or minus 1 percent, per ASTM C 173.

6. Slump: 3 inches plus or minus 1 inch.

7. Maximum Aggregate Size: 1 inch.

E. Normal Weight Concrete, Type B:

1. Type B concrete shall be used only at specific locations shown.

2. Compressive Strength: The minimum acceptable compressive strength, when tested in accordance with ASTM C 39, shall be as follows:

a. 7 days: 3,000 psi.

b. 28 days: 4,000 psi.

3. Cement Content: Minimum 628 lb per cubic yard.

4. Water-Cement Ratio: Maximum 0.462 by weight.

5. Total Air Content: 6 percent plus or minus 1 percent, per ASTM C 173.

6. Slump: 6 inches plus or minus 1 inch.

7. Maximum Aggregate Size: 1/2 inch.

2.7 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

1. Delivery Tickets:

a. A delivery ticket shall be prepared for each load of ready-mixed concrete and a copy of the ticket shall be handed to the Contractor by the truck operator at the time of delivery before unloading at the site.

b. Copies of delivery tickets shall be given to the Engineer upon request.

c. Tickets shall indicate the following:

1) Name and location of the concrete supplier.

2) Serial number of ticket.

3) Date.

4) Truck number.

5) Name of purchaser.

6) Project name and location.

7) Numerical sequence of the delivery.

8) Specific class or designation of the concrete.

9) Amount of concrete in cubic yards.

10) Time loaded or of first mixing of cement and aggregates.

11) Reading of revolution counter at the first addition of water.

12) Type and brand and amount of cement.

13) Type and brand and amount of admixtures.

14) Information necessary to calculate the total mixing water added by the producer. Total mixing water includes free water on the aggregates, water, and ice batched at the plant.

15) Maximum size of aggregate.

16) Weights of fine and coarse aggregate.

17) Outdoor temperature in the shade at the time at which the cement was added.

18) Signature or initials of ready-mix representative.

2. Water from the truck water system or elsewhere shall not be added after the initial introduction of mixing water for the batch.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.2 PREPARATION

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Verify that forms are clean before applying release agent.

C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

E. In locations where new concrete is doweled to existing work, drill holes and epoxy dowels in existing concrete.

3.3 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

A. Unless otherwise indicated on the drawings, the details of fabrication shall conform to ACI 318.

B. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

D. For all items subject to corrosion, including tie wires, provide the same concrete cover as is required for reinforcement under the same condition.

3.4 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Concrete placed by pumping methods shall be done in accordance with ACI 304.2R.

D. Mixing Time: The time from initial introduction of mixing water to discharge shall not exceed the following computation: Time = 1 hour at concrete temperature of 75 degrees F +/- 15 minutes per 5 degree F drop/rise in concrete temperature. Examples follow:

1. At concrete temperature of 50 degrees F, the time to discharge shall not exceed 2 hours and 15 minutes.

2. At concrete temperature of 60 degrees F, the time to discharge shall not exceed 1 hours and 45 minutes.

3. At concrete temperature of 70 degrees F, the time to discharge shall not exceed 1 hours and 15 minutes.

4. At concrete temperature of 80 degrees F, the time to discharge shall not exceed 45 minutes.

E. Notify Engineer not less than 24 hours prior to commencement of placement operations.

F. Before concrete is placed, forms, reinforcement, anchor bolts, and embedments shall be rigidly secured in proper position; all dirt, mud, water, and debris shall be removed from the space to be occupied by concrete; all surfaces encrusted with dried concrete from previous placements shall be cleaned.

G. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

H. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.5 SLAB JOINTING

A. Locate joints as indicated on the drawings.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.

D. Prior to concrete placement, the subgrade shall be well-dampened.

E. All exterior pool walls and interior pool floor slabs shall be in place and shall have obtained the design compressive strength prior to backfilling.

F. Conveying Concrete:

1. Methods of conveying concrete to the point of final deposit shall prevent segregation or loss of ingredients.

2. The free drop of concrete shall be limited to 5 feet.

3. Drop chutes shall be used for placement of concrete in walls. Drop chutes shall be positioned in walls 5 feet or less from wall corners and at 10 feet maximum centers.

4. After placement in the forms, concrete shall not be moved laterally more than 5 feet.

G. Consolidation/Compaction:

1. Consolidate in accordance with ACI 309R.

2. For proper consolidation/compaction, concrete shall be placed in approximately horizontal layers not to exceed 24 inches. Each layer of concrete shall be plastic when covered with the following layer, and the rate of vertical rise of the concrete in the forms shall be not less than 24 inches per hour.

3. During and immediately after placement, concrete shall be thoroughly compacted and worked around all reinforcement and embedments and into the corners of the forms.

4. The number and type of vibrators shall be acceptable to the Engineer.

5. When using internal vibrators, the "field of action" shall overlap. When placing concrete in lifts, the vibrator shall penetrate the previous lift by a few inches.

6. The use of "jitterbug" tampers to compact concrete flatwork will not be permitted.

H. Placement of Concrete on Slopes: Place, consolidate, and finish concrete from the bottom of the slope to the top of the slope.

I. Separate slabs on grade from vertical structure surfaces with joint filler.

J. Place joint filler in floor slab pattern placement sequence where indicated. Set top to required elevations. Secure to resist movement by wet concrete.

K. Install joint devices in accordance with manufacturer's instructions.

L. Apply sealants in joint devices in accordance with Section 079010.

M. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

N. Place concrete continuously between predetermined expansion, control, and construction joints.

O. Do not interrupt successive placement; do not permit cold joints to occur.

P. Place floor slabs in checkerboard or saw cut pattern indicated.

Q. Saw cut joints within 12 hours after placing. Unless noted otherwise, use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.

R. Screed floors and slabs on grade to slope as indicated, maintaining surface flatness of maximum 1/4 inch in 10 ft.

S. Tolerances:

1. As specified in ACI 301 unless noted otherwise.

3.6 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

1. Tie holes in formed surfaces shall be cleaned, wetted, and filled with non-shrink grout.

2. The patches shall be finished flush and shall match the texture of the adjacent concrete.

B. Unexposed form finish including pit interiors and pool gutter channels: Rub down or chip off fins or other raised areas 1/8 inch or more in height.

C. Exposed form finish including, but not necessary limited to, pool walls, foundations & footings above grade, and retaining walls: Rub down or chip off and smooth all fins, offsets, or other raised areas 1/8 inch or more in height. Provide finish as follows:

1. Grout Cleaned Finish: Grout cleaned finish shall conform to Paragraph 5.3.3.4.b of ACI 301. Grout cleaning shall not result in an overall plastering of the concrete surface, but shall produce a smooth, uniform surface free of marks, voids, surface glaze, and cement dust.

a. Sandblast surface to expose air voids, to round entrances to air voids, to expose sand aggregate, and to remove all form marking. Abrasive blast to scarify bare concrete to an ICRI CSP 5 surface profile and no more than an ICRI CSP 6 profile. Sandblast material shall be No. 4 Flint rock particles or "Black Beauty" or "Black Magic" (a boiler/coal slag).

b. Mix 1 part portland cement and 1-1/2 parts fine sand with sufficient water to produce a grout having the consistency of thick paint.

c. Wet the surface of the concrete sufficiently to prevent absorption of water from the grout and apply the grout uniformly with brushes or a spray gun.

d. Immediately after applying the grout, scrub the surface vigorously with a cork float or stone to coat the surface and fill all air bubbles and holes.

e. While the grout is still plastic, remove all excess grout by working the surface with a rubber float, burlap, or other means.

f. After the surface whitens from drying (about thirty minutes at normal temperatures), rub vigorously with clean burlap to provide a uniform sandy textured surface.

g. The finish shall be kept damp for at least 36 hours after final rubbing.

D. Finishing Unformed Surfaces:

1. General:

a. Buried concrete blocking and encasement will require no finishing except as necessary to obtain the required surface elevations or contours.

b. The unformed surfaces of all other concrete shall be screeded and given an initial float finish followed by additional floating, and troweling where required.

c. Water shall not be applied to the concrete during finishing operations.

2. Screeding: Screeding shall produce a concrete surface conforming to the proper elevation and contour, with all aggregates completely embedded in mortar.

3. Floating:

a. Bull Floating: Screeded surfaces shall be given an initial float finish immediately following screeding and shall be completed before any excess moisture or bleeding water is present on the surface. Any piece of coarse aggregate which is disturbed by the float or which causes a surface irregularity shall be removed and replaced with mortar. Initial floating shall produce a surface of uniform texture and appearance, with no unnecessary working of the surface.

b. Initial floating shall be followed by a second floating at the time of initial set (when foot pressure will mark concrete to about 1/4 inch depth). Do no floating with bleed water present. If conditions permit, wait out the bleeding period before floating. If not, remove bleed water before starting floating operations per ACI 302.1R. The second floating shall produce a finish of uniform texture and color.

c. Floating shall be done with hand floats or suitable mechanical compactor-floats.

4. Finishing: Finish to requirements of ACI 302.1R, and as follows:

a. Pool Basin Floor Slabs: Broom finish to provide a uniform medium to heavy non-slip surface. Brooming shall be done after the second floating and at right angles to the normal direction of traffic.

b. Top of Pool Walls: Broom finish to provide a uniform medium to heavy non-slip surface. Broom parallel to the inside face of the pool walls.

c. Surge Tanks or Wet Pits: Light broom finish. Brooming shall be done after the second floating.

d. Pump Pits: Broom finish to provide a uniform medium non-slip surface. Brooming shall be done after the second floating.

e. Concrete Decks and Walks: Broom finish to provide a uniform medium non-slip surface. Brooming shall be done after the second floating and at right angles to the normal direction of traffic.

f. Pavements: Following placement and consolidation, and the disappearance of bleed water, the concrete surface shall be broom finished with a broom acceptable to the Engineer. The broom shall be not less than 18 inches wide and made from good quality bass or bassine fibers not more than 5 inches long. The broom finishing shall produce regular corrugations not over 1/8 inch deep. The broom shall be pulled square across the surface, from edge to edge, with adjacent strokes slightly overlapped, and shall not tear the concrete surface.

g. Curb and Gutters: Curb and gutters shall be finished to the shape indicated on the drawings. After the forms have been removed, all exposed edges shall be rounded, using an edging tool with a 1/8 inch corner radius. Exposed surfaces shall be float finished and given a light broom finish applied at right angles to the curb at the time of initial set, using a horsehair broom.

h. Sidewalks:

1) Concrete surfaces shall be screeded to the proper elevation and contour. All aggregates shall be completely embedded in mortar. Screeded surfaces shall be given an initial float finish as soon as the concrete has stiffened sufficiently for proper working. Any piece of coarse aggregate which is disturbed by the float or which causes a surface irregularity shall be removed and replaced with mortar. Initial floating shall produce a surface of uniform texture and appearance, with no unnecessary working of the surface. Initial floating shall be followed by a second floating at the time of initial set.

2) Floated surfaces shall be given a light broom finish, using a horsehair broom, to provide a non-slip surface. Brooming shall be done at right angles to the length of the walk.

3) Unless noted otherwise on the drawings, sidewalks shall be edged using a 3 or 4 inch wide edging tool with a 1/8 inch corner radius. Edger lap marks at corners of each slab shall be carefully removed. False joints shall be provided at right angles to the length of the walk, using a grooving tool with 1/8 inch radius. The finished edge on each side of the joint shall be the same width as the edging tool used. False joints shall divide each sidewalk into square sections.

4) The finished surface of all sidewalks shall be neat in appearance, shall be sloped to drain, and shall not pond water.

E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains as indicated on drawings.

3.7 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

1. Normal concrete: Not less than 7 days.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

D. Surfaces Not in Contact with Forms:

1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than seven days by water ponding, water-saturated sand, water-fog spray, saturated burlap, or low permeability and high moisture retention non-staining natural cellulose fabric with non-perforated reflective (white) polyethylene coating.

2. Final Curing: Begin after initial curing but before surface is dry.

a. Moisture-Retaining Cover: Seal in place with waterproof tape or adhesive.

E. Concrete shall be protected against freezing for at least 8 days after placement.

3.8 FIELD QUALITY CONTROL

A. Testing to be conducted as specified in administrative requirements.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. All concrete required for testing shall be furnished by, and at the expense of, the Contractor.

D. Submit proposed mix design of each class of concrete to testing firm for review prior to commencement of concrete operations.

E. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.

F. When concrete is pumped, sampling at both the truck discharge and point of final placement shall be required to determine if any changes in the slump, air content, and other significant mix characteristics occur. All concrete characteristics at the point of placement shall meet the specified requirements.

G. Compressive Strength Tests:

1. Compression test specimens shall be made, cured, stored, and delivered to the laboratory in accordance with ASTM C 31 and C 39.

2. One set of concrete test cylinders shall be cast for each concrete pour unless approved otherwise by Engineer. A set of test cylinders shall consist of four cylinders, two to be broken and to have compressive strengths averaged at 7

days, and two to be broken and to have compressive strengths averaged at 28 days.

3. One additional test cylinder shall be taken during cold weather concreting, cured on job site under same conditions as concrete it represents.

4. Each set of compression test cylinders shall be marked or tagged with the date and time of day the cylinders were made, the location in the work where the concrete represented by the cylinders was placed, the number of the delivery truck or batch, the air content, the slump, and the concrete temperature.

H. Air Content:

1. Air content shall be determined in accordance with ASTM C 231.

2. An air content test shall be made on concrete from each batch of concrete from which concrete compression test cylinders are made.

3. The Contractor shall provide all equipment and supplies necessary for the testing.

I. Slump:

1. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

2. Pumped Concrete:

a. The slump of concrete that is discharged into the pump may exceed the specified value by the amount of slump loss in the pumping system, up to a maximum of 1 inch.

b. The slump loss shall be determined by tests made at each end of the pumping system.

c. If tests indicate a loss greater than 1 inch, Contractor shall modify the pumping system as required to reduce the slump loss to 1 inch or less.

J. Concrete Temperature:

1. A concrete temperature test shall be made on concrete from the first batch of concrete mixed each day and on concrete from each batch of concrete from which concrete compression test cylinders are made.

2. Concrete temperature shall be determined in accordance with ASTM C 1064.

3.9 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Engineer and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

C. In water retaining structures, crack widths that exceed ACI 224R requirements of 0.004 inches shall be treated with an appropriate injection system, which is acceptable to the Engineer.

D. Repair or replacement of defective concrete will be determined by the Engineer. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

E. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

END OF SECTION 033005

SECTION 040110 - MASONRY CLEANING & TREATMENT

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. This Section covers the cleaning and consolidation of the historic fountain sculptures. In March 2022, test cleaning was provided by Dickey Sales, LLC, which concluded that most stains and hard water deposits are bonded or embedded to the granite and limestone components. After 6 applications of cleaners, results were noticeable, but would require up to 12 applications for the granite and 6 applications for the granite, also resulting in microscopic etching. After chemicals were tested, the State engaged Blast it Clean in September 2022 to test several media options to formulate a methodology to safely clean the hard water crust that had formed on the limestone and the granite from the hard water deposits and to remove the epoxy coating on the concrete basin. The fountain sculptures have previously been cleaned with media blasting 15-20 years ago, but the process was not recorded, and the blasting resulted in noticeable pitting of the limestone sculptures.

B. Cleaning will include a combination of chemical and abrasive cleaning to safely clean the hard water crust, copper staining, and biological and atmospheric staining from the limestone and the granite fountain sculpture. Chemical cleaning will be used to safely clean the biological and atmospheric staining from the limestone fountain basin surrounding curved walls. Abrasive cleaning will be used to remove the epoxy coating from the concrete basin.

C. Stone Consolidation / Water Repellent will be used to treat the limestone on the sculptures and on the surrounding limestone on the fountain basin walls (top capstones and vertical limestones).

D. Additional repointing, stone replacement, sealants, and patching are outlined in Sections 040120 Masonry Rehabilitation and 040111 Masonry and Concrete Abrasive Cleaning and should be closely coordinated with work in this Section.

1.2 RELATED DOCUMENTS

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

B. **Section 001115.01 – PreQualification of Historic Masonry Restoration Contractors**

C. **Section 001115.02 – PreQualification of Abrasive Cleaning of Historic Masonry Contractors**

D. Section 040111 – Masonry and Concrete Abrasive Cleaning

E. Section 040120 – Masonry Rehabilitation

1.3 SUMMARY

A. Section includes cleaning the following:

1. Unit masonry surfaces.

2. Stone surfaces.

1.4 DEFINITIONS

A. Very Low-Pressure Liquid Spray: Under [100 psi (690 kPa)].

B. Low-Pressure Liquid Spray: 100 to 400 psi (690 to 2750 kPa); 4 to 6 gpm (0.25 to 0.4 L/s)

C. Medium-Pressure Liquid Spray: 400 to 800 psi (2750 to 5510 kPa); 4 to 6 gpm (0.25 to 0.4 L/s)

D. High-Pressure Liquid Spray: 800 to 1200 psi (5510 to 8250 kPa); 4 to 6 gpm (0.25 to 0.4 L/s)

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to cleaning masonry including, but not limited to, the following:

a. Verify masonry-cleaning equipment and facilities needed to make progress and avoid delays.
b. Materials, material application, and sequencing.
c. Cleaning program.
d. Coordination with nearby building and site occupants.
e. Provide full containment enclosures around structures to prevent wind carrying away chemicals.

1.6 SEQUENCING AND SCHEDULING

A. Work Sequence: Perform masonry-cleaning work in the following sequence:

1. Remove plant growth.
2. Inspect for open mortar joints. Where repairs are required, delay further cleaning work until after repairs are completed, cured, and dried to prevent the intrusion of water and other cleaning materials into the wall.
3. Remove paint.
4. Clean masonry surfaces.
5. Where water repellents or consolidant are to be used on or near masonry, delay application of these chemicals until after cleaning.

B. Do not attach scaffolding or any equipment to the fountain sculptures.

1.7 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include material descriptions and application instructions.
2. Include test data substantiating that products comply with requirements.

1.8 QUALITY ASSURANCE

A. **Refer to Section 001115.01 PreQualification of Historic Masonry Restoration Contractors to submit qualifications to be eligible to bid the masonry restoration work for this project. Only approved masonry contractors will be eligible to bid as a prime contractor or sub-contractor for this project.**
   1. **Interested Masonry Contractors may submit qualifications to be approved to bid the project, per Section 001115.01 PreQualification of Historic Masonry Restoration Contractors.**
   2. **Only Approved Masonry Contractors may bid the project.**

B. Chemical-Cleaner Manufacturer Applicator Qualifications: A firm regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with factory-authorized service representatives who are available for consultation and Project-site inspection, preconstruction product testing, and on-site assistance. Cleaning Contractor to have certifications and training to successfully apply the cleaning agents.

C. Cleaning Program: Prepare a written cleaning program that describes cleaning process in detail, including materials, methods, and equipment to be used; protection of surrounding materials; and control of runoff during operations. Include provisions for supervising worker performance and preventing damage.

   1. If materials and methods other than those indicated are proposed for any phase of cleaning work, add a written description of such materials and methods, including evidence of successful use on comparable projects and demonstrations to show their effectiveness for this Project.

D. Mockups: Prepare mockups of cleaning on existing surfaces to demonstrate aesthetic effects and to set quality standards for materials and execution. Coordinate cleaning mock-up with abrasive cleaning mock-ups, so show the full spectrum of the required cleaning of the fountain sculptures and basin surrounding walls.

   1. Cleaning: Masonry Contractor to lean an area approximately 2 sq. ft., or as indicated for each type of masonry and surface condition with each type of cleaner and stain removal.

   2. Use test areas as indicated and representative of proposed materials and existing construction.

   3. Propose changes to materials and methods to suit Project.

   4. Typical Testing.

      a. Test cleaners and methods on samples of adjacent materials for possible adverse reactions. Do not test cleaners and methods known to have deleterious effect.
      b. Allow a waiting period of not less than seven days after completion of sample cleaning to permit a study of sample panels for negative reactions.
      c. Engage product manufacturer representative to assist with mock-ups.

   5. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit masonry-cleaning work to be performed according to product manufacturers' written instructions and specified requirements.

B. Clean masonry surfaces only when air temperature is 40 deg F (4 deg C) and above and is predicted to remain so for at least seven days after completion of cleaning.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS

A. Water: Potable.

B. Hot Water: Water heated to a temperature of 140 to 160 deg F (60 to 71 deg C).

C. Detergent Solution, Job Mixed: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium pyrophosphate (TSPP), 1/2 cup (125 mL) of laundry detergent, and 20 quarts (20 L) of hot water for every 5 gal. (20 L) of solution required.

D. Mold, Mildew, and Algae Remover, Job Mixed: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium pyrophosphate (TSPP), 5 quarts (5 L) of 5 percent sodium hypochlorite (bleach), and 15 quarts (15 L) of hot water for every 5 gal. (20 L) of solution required.

E. Nonacidic Gel Cleaner: Manufacturer's standard gel formulation, with pH between 6 and 9, that contains detergents with chelating agents and is specifically formulated for cleaning masonry surfaces.

F. Nonacidic Liquid Cleaner: Manufacturer's standard mildly alkaline liquid cleaner formulated for removing mold, mildew, and other organic soiling from ordinary building materials, including polished stone, brick, aluminum, plastics, and wood.

G. Mild-Acid Cleaner: Manufacturer's standard mild-acid cleaner containing no muriatic (hydrochloric), hydrofluoric, or sulfuric acid; or ammonium bifluoride or chlorine bleaches.

H. Acidic Cleaner: Manufacturer's standard acidic masonry cleaner composed of hydrofluoric acid or ammonium bifluoride blended with other acids, detergents, wetting agents, and inhibitors.

I. One-Part Limestone Acidic Cleaner: Manufacturer's standard one-part acidic formulation for cleaning limestone.

J. Two-Part Chemical Cleaner: Manufacturer's standard system consisting of potassium- or sodium-hydroxide-based, alkaline prewash cleaner and acidic afterwash cleaner that does not contain hydrofluoric acid.

2.2 ACCESSORY MATERIALS

A. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, glazed masonry, and polished stone surfaces from damaging effects of acidic and alkaline masonry cleaners.

2.3 CHEMICAL CLEANING SOLUTIONS

A. Dilute chemical cleaners with water to produce solutions not exceeding concentration recommended in writing by chemical-cleaner manufacturer.

B. Acidic Cleaner Solution for Unpolished Stone: Dilute acidic cleaner with water to produce hydrofluoric acid content of 3 percent or less, but not greater than that recommended in writing by chemical-cleaner manufacturer.

1. Stones: Use only on unpolished granite, unpolished dolomite marble, and siliceous sandstone.

2.4 BIOLOGICAL AND ATMOSPHERIC STAIN REMOVER

A. Scope: To clean biological and atmospheric cleaning from the limestone fountain basin capstones and vertical stone panels. The cleaner will also be used to clean staining from the limestone in the central fountain sculpture in conjunction with the media blasting.

B. Manufacturer / Product: Bais of Design is Prosoco Enviro Klean ReKlaim and Sure Klean Limestone & Masonry Afterwash as a system, or approved equal.
1. Contractor to provide a 2-part liquid system (cleaner and activator) and neutralizer by the same manufacturer specifically formulated to safely remove biological and atmospheric staining from vertical and horizontal masonry surfaces and cleans difficult mold and mildew staining that blackens limestone and other masonry surfaces in humid climates. Product should effectively remove light-to-severe staining without damage to the surface or the environment.
2. Product Requirements:
   a. Cleaner:
      1) Form: Liquid
      2) Specific Gravity: 1.09
      3) pH: 13.7
      4) Weight/Gallon: 9.10 pounds
   b. Activator
      1) Form: Clear Liquid
      2) Specific Gravity: 1.10
      3) pH: 2.40
      4) Weight/Gallon: 9.57 pounds
   c. Afterwash / Neutralizer (does not contain hydrochloric (muriatic) or hydrofluoric acid)
      1) Form: Clear Liquid with odor
      2) Specific Gravity: 1.02
      3) pH: 1.10
      4) Weight/Gallon: 8.5 pounds

2.5 COPPER STAIN REMOVER

A. Scope: To clean copper staining from the limestone fountain central sculpture. This should be utilized before abrasive cleaning and to treat stubborn staining after abrasive blasting.

B. Manufacturer / Product: Basis of Design is Prosoco Copper Stain Remover, or approved equal.
1. Contractor to provide 2-part stain removal system designed to remove copper stains from masonry surfaces to be mixed on site into a poultice. Stain remover is to be specifically

formulated to solubilize deep-seated copper sulfate stains and draw staining elements out of the masonry and into the poultice mix.
2. Stain removal must not etch or harm the masonry surface.
3. Product must be compatible with other cleaners and consolidants to be used on the project.
4. Product is a strong alkaline cleaning compound.
5. Product Requirements:
    a. Part A - Dry Powder
        1) Form: Light brown powder
        2) Specific Gravity: 1.786
        3) pH: 5.0
    b. Part B – Liquid Additive
        1) Form: Clear, colorless liquid
        2) Specific Gravity: 0.971
        3) pH: 14
    c. Protective Film
        1) Provide protective film overlay to apply while poultice is working, as recommended by Manufacturer.

2.6 STONE CONOLIDANT AND WATER REPELLENT

A. Scope: For limestone sculpture treatment. (Refer to 2.7 for basin wall treatment). Utilize stone consolidation and water repellent treatment to stabilize deteriorated historic limestone by consolidation and protection from water. This treatment stabilizes the natural binding materials of the limestone with an ethyl silicate/silane treatment and both consolidates and provides water repellent characteristics. The treatment is deeply penetrating with an internal catalyst to convert the liquid into a glass-like silicon dioxide (SiO_2) gel to bind the stone particles.

B. Manufacturer / Product: Bais of Design is Prosoco H100 Consolidation Treatment, or approved equal.
1. Contractor to provide a single-component, low viscosity consolidation treatment that is rapid drying with no dirt attraction.
2. Product should be vapor permeable.
3. New binder to be acid resistant.
4. Product Requirements:
    a. Consolidant:
        1) Form: Clear, colorless, slightly-yellow liquid with alcohol odor
        2) Specific Gravity: 0.936
        3) pH: N/A
        4) Active Content: 100%
        5) Total Solids: 47% ASTM D 5095
        6) VOC Content: >400 g/L
    b. Final Flush:
        1) Methyl Ethyl Ketone (MEK)

2.7 MODIFIED SILOXANE STONE WATER REPELLENT

A. Scope: For limestone basin wall capstone and vertical stone treatment. (Refer to 2.6 for limestone fountain sculpture treatment). Utilize stone water repellent treatment to protect historic limestone from water penetration without altering the natural appearance.

B. Manufacturer / Product: Bais of Design is Prosoco Sure Klean Weather Seal Natural Stone Treatment, or approved equal.

1. Contractor to provide a single-component, modified siloxane water repellent developed specifically for limestone surfaces.
2. Product should be vapor permeable and should not alter the natural appearance of the substrate.
3. Product should reduce the severity of biological staining common to regions with high relative humidity. Treated surfaces should resist dark staining and degradation caused by fungal growth, mold, and mildew.
4. Small molecular size to allow for deep penetration.
5. Will not form a surface film or gloss.
6. Alkali resistant to protect new or existing mortar joints.
7. Reduces atmospheric soiling
8. Product Requirements:
    a. Water Repellent:
        1) Form: Clear, slightly-yellow liquid with alcohol odor
        2) Specific Gravity: 0.805
        3) pH: N/A
        4) Active Content: 11%
        5) Total Solids: 9% ASTM D 2369
        6) VOC Content: 713 g/L
        7) Sealant Waterproofing & Restoration Institute
            a) Product validated by SWRI Vertical Water Repellent Program.

PART 3 - EXECUTION

3.1 MASONRY-CLEANING SPECIALIST

A. Masonry-Cleaning Specialist Firms: Subject to compliance with requirements, provide masonry cleaning by a approved historic masonry contractor with a historic masonry-cleaning specialist with experience similar to that required by this scope of work.

3.2 PROTECTION

A. Comply with each manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent paint removers and chemical cleaning solutions from becoming airborne and from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

1. Cover adjacent surfaces with materials that are proven to resist paint removers and chemical cleaners used unless products being used will not damage adjacent surfaces. Use protective materials that are waterproof and UV resistant. Apply masking agents according to manufacturer's written instructions. Do not apply liquid strippable masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
2. Do not apply chemical solutions during winds of enough force to spread them to unprotected surfaces.
3. Neutralize alkaline and acid wastes before disposal.
4. Dispose of runoff from operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.
5. Provide containment to prevent chemical cleaners from becoming airborne, if needed.

3.3 CLEANING BIOLOGICAL AND ATMOSPHERIC STAIN REMOVER

A. Limitations:
1. Apply Cleaner and Neutralizer, per manufacturer's instructions.
2. Do not apply at temperatures below 40 degrees F (4 degrees C).
3. On concrete and architectural concrete block, repeated applications may result in surface etching.
4. Metal surfaces must be protected from exposure to cleaning solution.

B. Application: (Assume 2 Applications for Surrounds and Center Sculpture)
1. Before applying, read "Preparation" and "Safety Information" sections in the Manufacturer's Product Data Sheets for each product in the system.
2. Instructions:
   a. Working from bottom to top, apply prepared cleaning solution to a dry surface.
   b. Leave solution on the surface for 5 to 20 minutes. If solution begins to dry, reapply.
   c. Gently scrub heavily soiled areas.
   d. Rinse thoroughly with clean water. If using a sponge or string mop to rinse, change rinse water often. Pressure rinse porous surfaces to remove heavy soiling.
   e. Immediately after rinsing cleaning solution from masonry surface, apply the prepared neutralizer to the wet surface.
   f. Let the neutralizer stay on the surface for 3 to 5 minutes.
   g. Pressure rinse from the bottom of the treated area to the top. Make sure to cover each portion of the masonry surface with a concentrated stream of water. To avoid streaking, keep wall surfaces immediately below area being cleaned wet and free of cleaner rundown and residues.
   h. Note, the best combination of rinsing pressure and water volume is provided by masonry washing equipment generating 400-1000 psi with a water flow rate of 6-8 gallons per minute delivered through a 15-45 degree fan spray tip. Equipment should be adjustable to reduce water.
   i. Clean up per manufacturer recommendations.

3.4 COPPER STAIN REMOVER

A. Limitations:
1. Protect all surrounding materials and fixtures that may be harmed from this chemical treatment.
2. Apply stain remover, per manufacturer's instructions.
3. Do not apply at temperatures below 50 degrees F or if temperatures will be below freezing overnight. If freezing conditions exist before application, let masonry thaw completely.
4. Use appropriate equipment and tools, as recommended by the Manufacturer.

B. Application: (Assume 2 Applications)
1. Read Preparation and Safety Data Sheet before use.
2. Apply with manufacturer's recommended tools.
3. Mix stain remover components into a wet paste. Do not dilute or add water.
4. Mix stain removed in plastic buckets at a ratio required by manufacturer.
5. Protect workers from strong stain remover alkaline compound with protective equipment. Protect skin and eyes.
6. Follow manufacturer cover rate and apply per manufacturer instructions. Remove all air pockets for complete adhesion to limestone.
7. Cover poultice with manufacturer recommended semi-impermeable protective paper, per manufacturer recommendations and tape down edges.

8. Remove protective paper and allow poultice to completely dry, per manufacturer recommendations.
9. Scrape dry poultice from the surface.
10. Water-rinse the treated area using a soft-fibered brush to remove all poultice residue.
11. Clean up per manufacturer recommendations.

3.5 STONE CONOLIDANT AND WATER REPELLENT

A. Application: (Assume 3 cycles)
1. Before applying, read “Preparation” and “Safety Information” sections in the Manufacturer’s Product Data Sheets for each product in the system.
2. Proceed with application, only after mock-ups have been completed.
3. Apply Consolidation/Water Repellent treatment after all cleaning, patching, and pointing materials are in place.
4. Protect all adjacent surfaces where consolidation/water repellent are not to be applied (such as adjacent granite).
5. Apply in cycles, as recommended by manufacturer. A cycle included three successive saturating applications at 5-15 minute intervals. Anticipate 3 cycles (9 separate applications). Allow 20-60 minutes between cycles.
6. Additional material should be applied until excess material remains visible on the surface for 60 minutes following the last application. Once this degree of saturation is achieved over the entire surface, the first treatment is complete.
7. Immediately flush excess surface materials using industrial grade MEK (methyl ethyl ketone) or mineral spirits. If a second treatment is necessary, allow 2-3 weeks curing time following first treatment.
8. Proper timing of the application process will maximize the penetration of the consolidation treatment. Deep penetration is critical to the long term benefits of the consolidation treatment.
9. Clean up tools and equipment with mineral spirits, denatured alcohol or an equivalent cleaning solvent. Remove over spray and spills as soon as possible.
10. Contractor to protect from rain for at least 2 days following application.

3.6 STONE WATER REPELLENT

A. Preparation:
1. Verify surfaces to receive water repellent treatment are clean, free of efflorescence, oil, grease, or other foreign matter detrimental to application.
2. Remove loose particles and foreign matter. Remove grease or oil with a solvent, effective alkaline cleaner, or detergent as instructed by water repellent manufacturer. Scrub surfaces with water.
3. Allow surfaces to dry prior to application.
4. Protect all surrounding areas as recommended by the manufacturer or as directed by the Architect.
    1. Windows: Windows shall be protected from contact with materials by masking with polyethylene or other approved techniques.
    2. All polished stone, metal, or non-masonry surfaces shall be protected from contact with the material by masking with polyethylene.
    3. Masonry surfaces must be in good repair. All new construction or repointed surfaces must be allowed to cure for a minimum of 28 days prior to application. Surfaces must be completely dry.

5. Verify all windows, exterior intakes and air conditioning vents are covered and air handling equipment is shut down during application and until vapors have dissipated.
6. Coordination with Sealants: Do not apply water repellent until sealants for joints adjacent to surfaces receiving water-repellent treatment have been installed and cured.

B. WATER- Based MODIFIED Siloxane Water Repellent Treatment APPLICATION (VERTICAL APPLICATION)
   1. Test each surface and/or material to be treated to ensure compatibility and water repellent treatment results. The surface to be treated must be clean and free of all foreign matter and as dry as possible to ensure proper penetration of water repellent treatment.
   2. Do NOT dilute water repellent treatment.
   3. Proceed with application of water repellent treatment in an orderly manner once application rate has been tested; work from bottom to top of each scaffold width and from one end of each elevation to the other.
   4. Apply water repellent treatment wet-on-wet to vertical visibly dry and absorbent surfaces and comply with manufacturer's written instructions.
   5. Preferred method of application is with low pressure, airless diaphragm-type spray equipment. Apply in coverage rate as recommended by manufacturer for type of material.
   6. Spray Application:
      a. Apply treatment from bottom- up using a wet-on-wet application, creating a 6 to 8 inch rundown below the spray contact point. Let the first application penetrate into surface then reapply within 5 minutes in the same saturating manner. Apply in accordance with manufacturer recommendation. Do not spray apply at pressures exceeding 50 psi.

C. PROTECTION
   1. Protect adjacent surfaces not scheduled to receive water repellent treatment. If applied on unscheduled surfaces, remove immediately, by manufacturer approved method.
   2. Protect treated surfaces from rain for 6 hours.
   3. Correct damage by cleaning, repairing or replacing, and repainting, as approved by A/E.

3.7 CLEANING MASONRY, GENERAL

A. Cleaning Appearance Standard: Cleaned surfaces are to have a uniform appearance as viewed from 20 feet (6 m) away by Architect.

B. Proceed with cleaning in an orderly manner; work from bottom to top or top to bottom, or as required by the manufacturer, of each scaffold width and from one end of each elevation to the other. Ensure that dirty residues and rinse water do not wash over dry, cleaned surfaces.

C. Use only those cleaning methods indicated for each masonry material and location.

   1. Brushes: Do not use wire brushes or brushes that are not resistant to chemical cleaner being used.
   2. Spray Equipment: Use spray equipment that provides controlled application at volume and pressure indicated, measured at nozzle. Adjust pressure and volume to ensure that cleaning methods do not damage surfaces, including joints.

      a. Equip units with pressure gages.

b. For chemical-cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with nozzle having a cone-shaped spray.
c. For water-spray application, use fan-shaped spray that disperses water at an angle of 25 to 50 degrees.
d. For high-pressure water-spray application, use fan-shaped spray that disperses water at an angle of at least 40 degrees.
e. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F (60 and 71 deg C) at flow rates indicated.
f. For steam application, use steam generator capable of delivering live steam at nozzle.

D. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces. Keep wall wet below area being cleaned to prevent streaking from runoff.

E. Perform additional general cleaning, paint and stain removal, and spot cleaning of small areas that are noticeably different when viewed according to the "Cleaning Appearance Standard" Paragraph, so that cleaned surfaces blend smoothly into surrounding areas.

F. Water Application Methods:

1. Water-Soak Application: Soak masonry surfaces by applying water continuously and uniformly to limited area for time indicated. Apply water at low pressures and low volumes in multiple fine sprays using perforated hoses or multiple spray nozzles. Erect a protective enclosure constructed of polyethylene sheeting to cover area being sprayed.
2. Water-Spray Applications: Unless otherwise indicated, hold spray nozzle at least 6 inches (150 mm) from masonry surface and apply water in horizontal back-and-forth sweeping motion, overlapping previous strokes to produce uniform coverage.

G. Chemical-Cleaner Application Methods: Apply chemical cleaners to masonry surfaces according to chemical-cleaner manufacturer's written instructions; use brush or spray application. Do not spray apply at pressures exceeding 50 psi (345 kPa). Do not allow chemicals to remain on surface for periods longer than those indicated or recommended in writing by manufacturer.

H. Rinse off chemical residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting. Periodically during each rinse, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.

1. Apply neutralizing agent and repeat rinse if necessary to produce tested pH of between 6.7 and 7.5.

I. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.

3.8 PRELIMINARY CLEANING

A. Removing Plant Growth: Completely remove visible plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing remaining growth to dry as long as possible before removal. Remove loose soil and plant debris from open joints to whatever depth they occur.

B. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to planned cleaning methods. Extraneous substances include paint, calking, asphalt, and tar.

1. Carefully remove heavy accumulations of rigid materials from masonry surface with sharp chisel. Do not scratch or chip masonry surface.

3.9 CLEANING MASONRY

A. Cold-Water Soak:

1. Apply cold water by intermittent spraying to keep surface moist.
2. Use perforated hoses or other means that apply a fine water mist to entire surface being cleaned.
3. Apply water in cycles of five minutes on and 20 minutes off.
4. Continue spraying until surface encrustation has softened enough to permit its removal by water wash, as indicated by cleaning tests for 72 hours.
5. Remove soil and softened surface encrustation from surface with cold water applied by low-pressure spray.

B. Cold-Water Wash: Use cold water applied by low-pressure spray.

C. Hot-Water Wash: Use hot water applied by low-pressure spray.

D. Mold, Mildew, and Algae Removal:

1. Wet surface with cold water applied by low-pressure spray.
2. Apply mold, mildew, and algae remover by brush or low-pressure spray.
3. Scrub surface with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing. Use small brushes for mortar joints and crevices. Dip brush in mold, mildew, and algae remover often to ensure that adequate fresh cleaner is used and that surface remains wet.
4. Rinse with water applied by low-pressure spray to remove mold, mildew, and algae remover and soil.
5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

3.10 FINAL CLEANING

A. Clean adjacent nonmasonry surfaces of spillage and debris. Use detergent and soft brushes or cloths.

B. Remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.

C. Remove masking materials, leaving no residues that could trap dirt.

END OF SECTION 040110

SECTION 040111 - MASONRY AND CONCRETE ABRASIVE CLEANING

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. This Section covers masonry and concrete abrasive cleaning of the historic fountain sculptures (granite and limestone) and the fountain basin (concrete). In March 2022, test cleaning was provided by Dickey Sales, LLC, which concluded that most stains and hard water deposits are bonded or embedded to the granite and limestone components. After 6 applications of cleaners, results were noticeable, but would require up to 12 applications for the granite and 6 applications for the granite, also resulting in microscopic etching. After chemicals were tested, the State engaged Blast it Clean in September 2022 to test several media options to formulate a methodology to safely clean the hard water crust that had formed on the limestone and the granite from the hard water deposits and to remove the epoxy coating on the concrete basin. The fountain sculptures have previously been cleaned with media blasting 15-20 years ago, but the process was not recorded, and the blasting resulted in noticeable pitting of the limestone sculptures.

B. Cleaning will include a combination of chemical and abrasive cleaning to safely clean the hard water crust, copper staining, and biological and atmospheric staining from the limestone and the granite fountain sculpture. Chemical cleaning will be used to safely clean the biological and atmospheric staining from the limestone fountain basin surrounding curved walls. Abrasive cleaning will be used to remove the epoxy coating from the concrete basin.

C. Additional masonry cleaning and consolidation, repointing, stone replacement, sealants, and patching are outlined in Sections 040110 Masonry Cleaning and Treatment and 040120 Masonry Rehabilitation and should be closely coordinated with work in this Section.

1.2 SUMMARY

A. Section includes abrasive blasting cleaning and reconditioning to remove epoxy paint and calcified crust build-up from the fountain sculptures and basin. Work includes the following:
   1. Soft Abrasive cleaning of limestone masonry surfaces.
   2. Hard Abrasive cleaning of granite masonry surfaces.
   3. Hard Abrasive cleaning to remove epoxy paint from concrete surfaces in the fountain basin and pedestal.

1.3 RELATED DOCUMENTS AND SPECIFICATIONS

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

B. Section 001115.02 – PreQualification of Abrasive Cleaning of Historic Masonry Contractors

C. Section 040110 – Masonry Cleaning

1.4 SECTION INCLUDES:

A. All labor, materials, tools and other equipment (including scaffolding and containment), services and supervision required to complete blasting and cleaning work to surfaces and materials indicated on drawings and as specified herein.

1.5 SURFACE PREPARATION, WORK, AND PROTECTION STANDARDS

A. The latest applicable edition of the following standards and codes shall govern all materials and workmanship:

CSA-A23.1-94, Concrete Materials and Methods of Concrete Construction.
CSA-A23.4-94, Precast Concrete - Materials and Construction.
CAN/CSA-S269.3-M92, Concrete Formwork.
ACI 347, Recommended Practice for Concrete Formwork.
Workers Compensation Board (WCB) Industrial Health and Safety Regulations.
Master Painters Institute (***MPI***), Recommended Practices for Abrasive Blasting.
ICRI 310 Concrete Specifying Pack
Development of Particulate and Hazardous Emission Factors for Outdoor Abrasive Blasting, EPA Contract No. 68-D2-0159, Midwest Research Institute, Kansas City, MO, June 1995.
Emission Factor Documentation For AP-42 Section 13.2.6, Abrasive Blasting, Final Report, Midwest Research Institute, Cary, NC, September 1997.

B. Applicable local Building Code.

C. “OSHA Fact Sheet – Protecting Workers from the Hazards of Abrasive Blasting Materials,” including all applicable OSHA Standards and Safety and Health Topic Pages.

D. All work in accordance with The Society for Protective Coatings (SSPC) Surface Preparation Standards
1. SSPC-SP6/NACE No. 3, “Commercial Blast Cleaning’ – Removal of mill scale, rust, rust scale, paint or foreign matter by the use of abrasives propelled through nozzles or by centrifugal wheels, to the degree specified. A Commercial Blast Cleaned Finish is defined as one from which all oil, grease, dirt, rust scale and foreign matter have been completely removed from the surface and all rust, mill scale, and old paint have been completely removed except for slight shadows, streaks, or discoloration caused by rust stain, mill scale oxides or slight, tight residues of paint or coating that may remain; if the surface is pitted, slight residues of rust of paint may be found in the bottom of pits; at least two-third of each square inch of surface shall be free of all visible residues and the remainder shall be limited to the light discoloration, slight staining or sight residues mentioned above.
2. SSPC-SP13/NACE No. 6, “Surface Preparation of Concrete” – An acceptable prepared concrete surface should be free of contaminants, laitance, loosely adhering concrete, and dust, and should provide a dry, sound, uniform substrate suitable for the application of protecting coating or lining systems. Filler may be required.
3. SSPC-AB 1-2019, Mineral and Slag Abrasives
4. The equipment used for abrasive blast cleaning must be able to achieve various levels of cleaning and that are adjustable to be project specific. Test cleaning will be required at the beginning of the project to review and sign off that the level of cleaning will achieve or exceeds the parameters of the project without causing damage to the historic sculpture and fountain components.

E. All work in accordance with the International Standards Organization (ISO) 8501 publication.

1.6 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to cleaning masonry including, but not limited to, the following:

a. Verify masonry-cleaning equipment and facilities needed to make progress and avoid delays.
b. Materials, material application, and sequencing.
c. Cleaning program.
d. Coordination with nearby building and site occupants.
e. Provide full containment enclosures around structures to prevent wind carrying away dust and particles.
f. Provide adequate ventilation and fresh air for workers within the containment.
g. Provide a layout for approval for equipment needed for blasting at each fountain.

1.7 SEQUENCING AND SCHEDULING

A. Work Sequence: Perform masonry-cleaning work in the following sequence:

1. Remove plant growth.
2. Inspect for open mortar joints. Where repairs are required, delay further cleaning work until after repairs are completed, cured, and dried to prevent the intrusion of water and other cleaning materials into the wall.
3. Remove paint.
4. Clean masonry surfaces.
5. Where water repellents are to be used on or near masonry, delay application of these chemicals until after cleaning.

B. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in masonry units according to masonry repair Sections. Patch holes in mortar joints according to masonry repointing Sections.

1.8 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include material descriptions and application instructions.
2. Include test data substantiating that products comply with requirements.

1.9 INFORMATIONAL SUBMITTALS

A. Qualification Data: For abrasive blasting cleaning contractor.

B. Preconstruction Test Cleaning Reports: For cleaning materials and methods.

C. Cleaning program.

1.10 QUALITY ASSURANCE

A. **Abrasive Cleaning of Historic Masonry Contractor Qualifications: Contractor must complete the Section 001115.02 PreQualification for Abrasive Cleaning of Historic Masonry Contractor form to be eligible to bid this project.** The abrasive blasting contractor shall have a record of satisfactory performance in the trade and shall maintain a qualified crew competent in abrasive blasting and cleaning throughout the duration of the work. Only qualified journeymen holding a Provincial Tradesman Qualified Certificate of Proficiency shall be engaged in such work. Apprentices under the direct supervision of qualified tradesman may also be engaged in such work. ***All abrasive cleaning work is to be conducted under the direct supervision of the Historic Masonry Contractor.***

B. Cleaning Program: Prepare a written cleaning program that describes cleaning process in detail, including materials, methods, and equipment to be used; protection of surrounding materials; and control of runoff during operations. Include provisions for supervising worker performance and preventing damage.

1. If materials and methods other than those indicated are proposed for any phase of cleaning work, add a written description of such materials and methods, including evidence of successful use on comparable projects and demonstrations to show their effectiveness for this Project.

C. Mockups: Prepare mockups of cleaning on existing surfaces to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Cleaning: Contractor to lean an area approximately 1 sq. ft., or as indicated for each type of masonry and surface condition with each type of cleaner and stain removal.

2. Contractor shall provide 5-10 mock-ups of the specified blast media, approximately 1 sq. ft., as determined by the Architect and Owner to ensure media type, effective, and approved psi strength. Abrasive blast a designated sample panel or area using the abrasive blast finish as noted on Schedule of Abrasive Blast Finishes and/or as specified herein.

3. Use test areas as indicated and representative of proposed materials and existing construction.

4. Final abrasive type and gradation will be selected by the abrasive blasting contractor and approved by the Architect and the Owner to achieve the desired finish.

5. Contractor to propose changes to materials and methods to suit Project.

6. Typical Testing.

   a. Test cleaners and methods on samples of adjacent materials for possible adverse reactions. Do not test cleaners and methods known to have deleterious effect.
   b. Allow a waiting period of not less than seven days after completion of sample cleaning to permit a study of sample panels for negative reactions.

7. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.11 REQUIREMENTS OF REGULATORY AGENCIES

A. Perform all work in strict accordance with “OSHA Fact Sheet – Protecting Workers from the Hazards of Abrasive Blasting Materials,” including all applicable OSHA Standards and Safety and Health Topic Pages.

B. Perform all work in strict accordance with the latest Industrial Health and Safety Regulation requirements of local authorities having jurisdiction.

C. Perform all work in strict accordance with the latest requirements / restrictions of appropriate authorities having jurisdiction (local, regional or national), particularly in regard to storage, handling and disposal of abrasive blast materials including waste / hazardous residue.

D. Ensure appropriate environmental safeguards are in place before commencement of work.

1.12 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit masonry-cleaning work to be performed according to product manufacturers' written instructions and specified requirements.

B. Clean masonry surfaces only when air temperature is 40 deg F (4 deg C) and above and is predicted to remain so for at least seven days after completion of cleaning.

PART 2 - PRODUCTS

2.1 HAZARD-FREE ABRASIVE MEDIA

A. Provide only abrasive blast media containing no free crystalline silica and no lead or other hazardous by-products.

2.2 CLEANING MATERIALS

A. Water: Potable.

B. Hot Water: Water heated to a temperature of 140 to 160 deg F (60 to 71 deg C).

C. Detergent Solution, Job Mixed: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium pyrophosphate (TSPP), 1/2 cup (125 mL) of laundry detergent, and 20 quarts (20 L) of hot water for every 5 gal. (20 L) of solution required.

2.3 BLAST MEDIA MATERIALS – TO BE APPROVED THROUGH MOCK-UP

A. To remove epoxy coating in basin: Black Beauty (or similar), low-dusting, silica-free abrasive, 40 psi.

B. To remove calcified crust from granite base and bowl: glass beads, 40 psi.

C. To remove calcified crust from limestone sculpture: corn cob or walnut shells (test both), 40 psi.

D. Final abrasive type and gradation will be selected by the abrasive blasting contractor and approved by the Architect and the Owner to achieve the desired finish.

2.4 EQUIPMENT

A. For blast finishes, air compressors with sufficient air replacement must be used.

B. Nozzle: Adjustable nozzle, minimum 40 psi to 100 psi.

C. Entire delivery system must be capable of providing consistent air pressure and media delivery to achieve a consistent blasting cleaning.

D. Main Hose: minimum 1.25" (32 mm) I.D.

E. Blasting Machine: (pot) equipped, in addition to the blast hose with a water (moisture) trap, complete remote control (deadman) valve, abrasive control valve, exhaust valve, air intake (choke) valve, hand hold, and blast helmet. Pot and equipment must be cleaned completely when changing blast media to prevent contamination.

F. Connections shall be of the quick coupling type.

G. Containment: Contractor to provide full containment at fountain to prevent dust and debris from becoming airborne outside of the project area.

H. The entire blast delivery system (hoses, couplings, nozzle, manifold, and valves) must not leak air to ensure consistent air delivery.

I. Reduce all possible constrictions to the flow of abrasive media. Internal diameter of all hoses and manifolds must be the same size.

J. Hoses should have an internal diameter as wide as possible and/or must be consistent in diameter.

2.5 ABRASIVE BLAST FINISHES:

A. SF1 (Brush) Finish: to remove surface dirt and stains and to give the surface a uniform appearance. For all limestone and granite cleaning.

B. SF2 (Light) Finish: to remove surface dirt and stains and expose some of the fine aggregate. Depth of cut shall not exceed 1.5 mm (1/16”). For concrete resurfacing, per manufacturer’s requirements.

C. SF3 (Medium) Finish: to expose the face of coarse aggregate near the surface. Depth of cut shall not exceed 5 mm (3/16").

D. SF4 (Heavy) Finish: to expose more of the coarse aggregate near the surface. Depth of cut shall not exceed 10 mm (3/8").

PART 3 - EXECUTION

3.1 ABRASIVE BLASTING CLEANER

A. Abrasive Blasting Cleaner Qualifications: Subject to compliance with requirements, provide Abrasive Blasting Cleaner with experience similar to that required by this scope of work.

B. The General Contractor and Historic Masonry Contractor shall be responsible to assure the abrasive blasting contractor that the mix design has been adhered to and shall ensure that this abrasive blasting contractor has access to all sections of the building or structure where abrasive blasting work is to be performed.

3.2 PROTECTION

A. The abrasive blast applicator shall be protected by such equipment as is mandated by the safety authority having jurisdiction. All respirators must meet OSHA Respiratory Protection standard (29 CFR 1910.134).

B. Provide all personal protective equipment for workers and training on the use of the equipment, per “OSHA Fact Sheet – Protecting Workers from the Hazards of Abrasive Blasting Materials,”

C. Prevent dust and debris from abrasive cleaning operations from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
   1. Erect barriers or screens and post signs to warn, limit or direct traffic away or around work area as required.
   2. Provide enclosed containment system to prevent dust and debris from becoming airborne outside of the project area.
   3. Mask and protect all existing adjacent finishes from damage by this trade.
   4. Do not perform work during winds of enough force to spread them to unprotected surfaces.
   5. Provide fresh ventilation air for all personnel during the work.
   6. Contain particulate matter (PM) and hazardous air pollutants through use of an appropriate filter or by controlling methods of blasting operations, per industry standard.

3.3 CLEANING MASONRY AND CONCRETE, GENERAL

A. Methods of abrasive blasting finishes to be carried out by the generally accepted methods of the trade by qualified tradesmen and equipment noted herein.

B. Prior to commencement of abrasive blasting, examine all surfaces scheduled to be worked on.

C. Report in writing to the Architect and Owner any condition which might adversely affect the work. Blast work shall not proceed until all such defects or conditions have been corrected and surfaces are acceptable for abrasive blasting.

D. Protect all adjacent materials from over-spray of abrasive blast materials that are not being currently cleaned.

E. Use only those cleaning methods (materials, distance from sculptures to nozzle, and psi) approved in the mock-up for each masonry material and location.

F. Hoses should be laid out as straight as possible, avoiding kinks, bends, and sharp angles.

G. Proceed with cleaning in an orderly manner.

H. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces. Produce an even finished appearance that is aesthetically pleasing and matches the approved mock-up.

I. Perform additional general cleaning, paint and stain removal, and spot cleaning of small areas that are noticeably different when viewed according to the "Cleaning Appearance Standard" Paragraph, so that cleaned surfaces blend smoothly into surrounding areas.

J. Cleaning Appearance Standard: Cleaned surfaces are to have a uniform appearance as viewed from 5 feet away by Architect.

K. Clean equipment and dispose of wash water / abrasives as well as all other protective materials (e.g. drop cloths, masking, etc.) in accordance with the safety requirements of authorities having jurisdiction.

L. Dispose of blast waste by legal means and in a manner. Do not dispose of waste on site.

M. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks. Remove all equipment and residue and leave areas broom clean.

N. Final Cleaning: All abrasive blast surfaces are to be washed down to remove residue material.
   1. Water Application Methods:
      a. Water-Spray Applications: Unless otherwise indicated, hold spray nozzle at least 6 inches (150 mm) from masonry surface and apply water in horizontal back-and-forth sweeping motion, overlapping previous strokes to produce uniform coverage.

3.4 PRELIMINARY CLEANING

A. Removing Plant Growth: Completely remove visible plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing remaining growth to dry as long as possible before removal. Remove loose soil and plant debris from open joints to whatever depth they occur.

B. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to planned cleaning methods. Extraneous substances include paint, calking, asphalt, and tar.

   1. Carefully remove heavy accumulations of rigid materials from masonry surface with sharp chisel. Do not scratch or chip masonry surface.

3.5 FINAL CLEANING

A. Clean adjacent nonmasonry surfaces of spillage and debris.

B. Remove debris from basin and drains.

C. Remove masking materials, leaving no residues that could trap dirt.

END OF SECTION 040111

SECTION 040120 - MASONRY REHABILITATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following brick and stone masonry rehabilitation:

1. Resetting existing and replacing existing stone capstones.
2. Masonry repointing.
3. Patching of spalled stone.
4. Dutchman repair of deteriorated stone.
5. Historic Masonry Restoration Contractor will coordinate and oversee the work required for the Masonry and Concrete Abrasive Cleaning Contractor scope of work. The Historic Masonry Restoration Contractor shall be on site supervising all work during the Abrasive Blasting to monitor the condition of the stone to prevent damage. Refer to Section 040111 Masonry and Concrete Abrasive Cleaning.
6. Coordinate all work with the required cleaning and stone consolidation and water repellent treatments outlined in Section 040110.

B. Related Sections:

1. Division 1 Front End
2. Section 001115.01 – PreQualification of Historic Masonry Restoration Contractors
3. Section 013591 Historic Treatment procedures
4. Section 024296 Historic Removal and Dismantling
5. Section 040110 Masonry Cleaning and Treatment
6. Section 040111 Masonry and Concrete Abrasive Cleaning
7. Section 079200 Joint Sealants

1.2 DEFINITIONS

A. Low-Pressure Spray: 100 to 400 psi; 4 to 6 gpm.

B. Medium-Pressure Spray: 400 to 800 psi; 4 to 6 gpm.

C. Repointing: Act of partially raking existing mortar joints and installing replacement mortar.

D. Tuckpointing or Pointing: Act of placing mortar into joints to completely fill joints in newly laid masonry.

E. Dutchman: Replacement in-kind of stone material to be field-fit into existing location with minimal aesthetic difference.

1.3 SUBMITTALS

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

1. Custom Mortar Mix for Each Location: Fountain limestone sculpture; Fountain granite bowl and base; Fountain Basin Capstones and Basin Walls.

2. Custom Mortar Patching Compound for Stone Patch. Provide a range of stone-colored samples (minimum 3" briquettes) for Mortar Patching Compound to select from in the color range of the existing stone.

3. Accessories

4. Replacement Stone Units and Dutchman Unit Repairs: Sculpture Limestone; Basin Capstones; Vertical Wall Panels at Basin Samples for each location. Limestone color may vary between sculpture and basin walls.

B. Shop Drawings:
1. Include plans, elevations, sections, and locations of stone repair work on the structure.
2. Indicate complete dimensions for new stone units and their jointing, showing relation of existing to new units.
3. Indicate setting number of each new stone unit and its location on the structure in annotated plans and elevations.
4. Show provisions for expansion joints or other sealant joints.
5. Show replacement and repair anchors, including drilled-in pins.

C. Mock-ups:
1. Mock-up for pointing mortar at fountain limestone sculpture.
2. Mock-up for pointing mortar at fountain granite.
3. Mock-up for pointing mortar on surround walls.
4. Mock-up for mortar patching compound at multiple locations determined by the Architect.

1.4 QUALITY ASSURANCE

A. **Refer to Section 001115.01 PreQualification of Historic Masonry Restoration Contractors to submit qualifications to be eligible to bid the masonry restoration work for this project. Only approved masonry contractors will be eligible to bid as a prime contractor or sub-contractor for this project**

B. Mock-ups: Build mock-ups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

C. Preinstallation Conference: The Contracting Officer shall conduct a preinstallation conference at the Project Site to review all masonry restoration scopes of work. Coordinate with Division 7 requirements.

D. Source of Materials: Obtain materials for masonry restoration from a single source for each type of material required to ensure match of quality, color, pattern, and texture.

E. Repointing mortar shall be prepared and placed in accordance with the Department of the Interior / National Park Service Cultural Resources Preservation Brief Number 2: "Repointing Mortar Joints in Historic Masonry Buildings," Revised edition, October 1998, and in compliance with the guidelines set forth by the *Secretary of the Interior's Standards for Rehabilitation* and as specified herein.

F. All cleaning work shall be in compliance with the guidelines set forth in the Department of the Interior / National Park Service Cultural Resources Preservation Brief Number 1: "Assessing

Cleaning and Water-Repellent Treatments for Historic Masonry Buildings." and Preservation Brief Number 6: "Dangers of Abrasive Cleaning to Historic Buildings."

1.5 WARRANTY

A. Special Warranty on Finishes: Manufacturer's standard form in which Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within 10 ten years from date of Substantial Completion.

1.6 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work.

B. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602 (Refer also to Specification 04902).

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried.

C. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Materials are to be delivered, stored, and handled to protect them from damage, extreme temperature, and moisture in accordance with Manufacturer's written instructions.

B. Deliver and store material in Manufacturer's original, unopened containers with the production date shown on the container or packaging.

C. Comply with the Manufacturer's written specifications and recommendations for mixing, application, and curing of restoration mortars.

PART 2 - PRODUCTS

2.1 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type II, white or gray or both where required for color matching of exposed mortar.

1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114.

B. Hydrated Lime: ASTM C 207, Type S.

C. Mortar Sand: ASTM C 144 unless otherwise indicated. Provide aggregate to match the color, size, texture, and gradation as present in the existing mortar where the repointing will occur.

1. Color: Provide natural sand or ground marble, granite or other sound stone of color necessary to produce required mortar color.
2. For pointing mortar, provide sand with rounded edges.
3. Match size, texture and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.

D. Mortar Pigments: Natural and synthetic iron oxides, compounded for mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.

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

a. Davis Colors; True Tone Mortar Colors.
b. Lanxess Corporation; Bayferrox Iron Oxide Pigments.
c. Solomon Colors; SGS Mortar Colors.
d. Approved Equal.

E. Water: Potable.

2.2 MASONRY MATERIALS

A. Stone Matching Existing: Natural building stone of variety, color, texture, grain, veining, finish, size, and shape that match existing stone.

1. Physical Properties for Limestone – Provide comparison data between existing Limestone and proposed replacement stone to include the following:

a. Compressive Strength: According to ASTM C170/C170M.
b. Modulus of Rupture: According to ASTM C99/C99M.
c. Absorption: According to ASTM C97/C97M.
d. Bulk Specific Gravity: According to ASTM C97/C97M.

2. For existing stone that exhibits a range of colors, textures, grains, veining, finishes, sizes, or shapes, provide stone that proportionally matches that range rather than stone that matches an individual color, texture, grain, veining, finish, size, or shape within that range.

2.3 MANUFACTURED REPAIR MATERIALS

A. Stone-Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching stone.

1. Acceptable manufacturers for patching materials are to be provided from one of the following: Cathedral Stone Jahn Patching Compounds (M70), Conproco, US Heritage Group.
2. Use formulation that is vapor and water permeable (equal to or more than the stone), exhibits low shrinkage, has lower modulus of elasticity than the stone units being repaired, and develops high bond strength to all stone types.
3. Formulate patching compound in colors, textures, and grain to match stone being patched. Provide sufficient number of colors to enable matching each piece of stone.

B. Stone-to-Stone Adhesive: Two-part polyester or epoxy-resin stone adhesive with a 15- to 45-minute cure at 70 deg F, recommended in writing by adhesive manufacturer for type of stone repair indicated, and matching stone color.

2.4 TIES AND ANCHORS

A. Materials:
   1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82; with ASTM A 153/A 153M, Class B-2 coating.
   2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, hot-dip galvanized after fabrication to comply with ASTM A 153/A 153M.
   3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch (16-mm) cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches (50 mm) parallel to face of veneer.

C. Lead: Lead shims can be utilized as a masonry wedge for the reinstallation and stabilization of the stone keystones.

D. Stone Anchors and Pins: Type and size indicated or, if not indicated, to match existing anchors in size and type. Fabricate from Type 316 stainless steel.

E. Setting Buttons and Shims: Resilient plastic, nonstaining to stone, sized to suit joint thicknesses and bed depths of stone units, less the required depth of pointing materials unless removed before pointing.

2.5 MASONRY CLEANERS

A. General Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains from masonry without damaging masonry during or after repointing. These are not intended for cleaning specified in Section 040110.
   1. Available Manufacturers:
      a. Diedrich Technologies, Inc.
      b. EaCo Chem, Inc.
      c. ProSoCo, Inc.
      d. Or Equal.

B. Water: Potable.

2.6 MASONRY CRACK INJECTIONS

A. Dispersed Hydrated Lime Injections: Manufacturer’s engineered repair mortar, free-flowing, and deep penetrating specially formulated mineral based, dispersed hydrated lime injection for hairline cracks.
   1. Available Manufacturers:
      a. U.S. Heritage Group
      b. Or Equal
   2. Product Information:
      a. No synthetic polymers
      b. Inhibitive against algae and mildew

c. Strong adhesion on mineral surfaces
d. Low tension
e. Weatherproof
f. UV, freeze-thaw, and salt resistance
g. Compressive Strength: 725-1450 psi
h. Bond Strength: 43-72 psi
i. Flexural Strength: 290-797 psi
j. Modulus of Elasticity: 5.8X10-(5)-1.3X10_(6) psi
k. Porosity: 24%-35%
l. Absorption: 14-25%
m. Linear Coefficient of Thermal Expansion: 6.2-6.4X10-(-6)/F degrees
n. Final installation required custom-matched DHL Spachtel.

PART 3 - EXECUTION

3.1 MOCK-UPS:

A. Mock-up of repointing, as required for the small areas of repointing. Surrounding mortar must be clean prior to mock-up in order to ascertain the best match for the new mortar. Repointing mock-up must indicate the proposed methods and craftsmanship taken to remove the existing mortar, as well as a section of mortar sampled for the replacement. The Architect and Owner shall approve the mock-up before any work may commence.

B. Mock-up of replacement limestone for capstones.

C. Mock-up for Dutchman replacement in the basin capstones and the central sculptures. Cleaned, dried, and finished to match the existing historic stone units in color, texture, and general overall aesthetic.

D. Mock-up of mortar stone patching in areas indicated by the Architect.

3.2 CLEANING PROTECTION

A. Prevent mortar from staining face of surrounding stone and other surfaces.

1. Cover sills, ledges, and other projecting items to protect them from mortar droppings.
2. Keep wall area wet below rebuilding and repair work to discourage mortar from adhering.
3. Immediately remove mortar splatters in contact with exposed stone and other surfaces.

B. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants and surrounding buildings from harm resulting from masonry restoration work.

C. Comply with chemical-cleaner Manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical cleaning solutions from coming into contact with people, motor vehicles, landscaping, buildings and other surfaces that could be harmed by such contact.

1. Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless chemical cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with Manufacturer's written instructions. When no longer needed, promptly remove masking to prevent adhesive staining.

2. Keep wall wet below area being cleaned to prevent streaking from runoff.

3.3 CHEMICAL CLEANING OF MASONRY

A. Perform only light cleaning with water and brush to remove excess mortar from areas of work.

3.4 MASONRY REINSTALLATION

A. Install replacement masonry into bonding and coursing pattern of existing masonry. Cutting should not be required if the masonry is constructed, per the original layout.
   1. Maintain joint width from the original construction for reconstruction.

B. Set replacement masonry with completely filled bed, head and collar joints. Butter vertical joints for full width before setting and set units in full bed of mortar, unless otherwise indicated. Replace existing anchors with new anchors of size and type indicated. Shim as required to maintain desired mortar joints and provide separation from the wood window frame. Provide lead wedge/shims or stainless steel anchors to secure keystone.

C. Pointing: Hold back, or rake out, setting mortar 1-1/8” from face of brick. Point with approved Pointing Mortar and tool joints as described in Section 3.2 as required to match existing joints.

D. Joints to be pointed in 5/8” layers or "lifts.” Apply in layers not greater than one half (1/2) the depth until a uniform depth is formed. Compact each layer thoroughly and allow it to become thumbprint hard before applying the next layer. Final pointing of new veneer masonry and existing pointing shall be the same final depth to finished surface.

E. The joints shall be finished to match the original historic joint profile.

F. Remove all excess mortar from face of masonry before it dries.

G. Efflorescence: Clean the area to be repaired with clean water and a nylon bristle brush to remove any loose brick particles. Neutralize any salt deposits (efflorescence) with distilled water and clean paper towels.

H. Use poultice method for removing salts from the wall by applying water generously, then placing paper towels on wet surface and allowing them to air dry. (The salts will come out from the wall and deposit on the paper after the wall dries). Dispose of paper. Repeat this process as many times as necessary to remove all salts from the wall surface.

I. Reinstall masonry units in their original locations, as labeled during removal.

J. Maintain uniform joint widths except for variations due to different masonry unit sizes and where minor variations are required to maintain bond alignment if any. Match existing historic mortar joint width.

3.5 REPOINTING

A. Mortar joints shall be removed selectively on the south elevation near the windows, as noted on drawings. Joints shall be removed back to sound, solid backup material. Joints that have been removed shall leave a clean, square face at the back of the joint to provide for maximum contact

of pointing mortar with the masonry backup mortar. Shallow joints or feather edging shall not be permitted. Remove joints to a minimum depth of 1-3/4" from the face of the brick surface.

B. All mortar joint removal depths are to be based upon the calculation of 2 to 2.5 times the width of the mortar joint as defined in the Preservation Brief 2, "Repointing Mortar Joints in Historic Masonry Buildings", U.S. Department of the Interior, National Park Service, Cultural Resources, Heritage Preservation Services, page 9.

C. Avoid exposing workers, building occupants and neighbors to dust. All windows, air intakes and exterior air conditioning vents should be covered (and air handling equipment shut down) throughout the application process and remain covered until any dust generating activities are completed.

D. Small hand powered saw (3-4" diameter) with 1/8" thick diamond blade may only be used for bed joints in the basin walls. Power tools will not be permitted to the used for the fountain sculpture repointing. Saw may only be used ***if Contractor has demonstrated ability to work with this tool to the Architect or designee*****. Cut out head joints by hand with chisel and mallet only.**

E. Removal of original mortar shall be done in two steps, first cutting the joint with a power saw or hand chisel and then chiseling remaining mortar out of the joint by hand. Using a power saw (or hand chisel) cut the joint at the center using a 1/8" thick by 4" diameter diamond blade cutting wheel. Use care not to cut limestone units. The use of cutting wheel will not be permitted in the vertical joints. Cut joints to the specified depth of 1-3/4", OR 2 ½ times the width. Chisel the remaining mortar out of the joint by hand; do not strike brick masonry edges.

F. Contractor shall not widen the existing masonry joints. The surrounding masonry edges shall not be further spalled or chipped in the process of mortar removal. Damage to surrounding masonry resulting from mortar removal will not be permitted. Contractor shall replace all masonry and damaged during mortar removal with replacement units that match the original exactly.

G. Remove dirt and loose debris from wall surfaces after joint and veneer removal by brush, vacuum, or compressed air with a moisture filter. The use of garden hoses and or large amounts of water will not be permitted for debris removal.

H. Exposed surface of brick adjacent to joint shall be wet prior to pointing. Maintain a water sprayer with misting capabilities on site at all times during the pointing process.

I. Area being repointed should be pre-wetted with water prior to pointing.

J. Joints should be pointed in layers or "lifts" where the joints are deeper than one and one-quarter (1-¼"). Apply in layers not greater than one half (1/2) the depth until a uniform depth is formed. Compact each layer thoroughly and allow it to become thumbprint hard before applying the next layer.

K. The joints shall be finished to match the original historic joint profile.

L. Remove all excess mortar from face of brick before it dries.

3.6 MASONRY CONSTRUCTION TOLERANCES

A. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/4 inch in 20 feet or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4 inch in 20 feet or 1/4 inch in 20 feet or more.

B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 1/4 inch in 20 feet or 1/2 inch in 40 feet or more.

C. Variation of Linear Building Line: For position shown in plan, do not exceed 1/4 inch in 10 feet or 3/4 inch in 20 feet or more.

3.7 MORTAR MIX

A. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
   1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.
      a. Mortar for Setting Limestone: Type O, 350 psi (maximum 500 psi).
      b. Mortar for Repointing Granite: Type N, 750 psi (maximum 1,000 psi).

B. Do not use admixtures in mortar unless otherwise indicated.

C. Mortar Proportions: Mix mortar materials in the following proportions:
   1. Pointing Mortar:
      a. (Type ‘O’) 1 part white Portland cement, 2 parts hydrated lime, and 9 parts sand.
      b. (Type ‘N’): 1 part white Portland cement, 1 part hydrated lime, and 6 parts sand.
      c. Add mortar pigments to produce mortar colors required.
   2. Rebuilding (Setting) Mortar: Comply with ASTM C 270, Proportion Specification, Type N unless otherwise indicated, with cementitious material limited to Portland cement and lime.

3.8 PARTIAL STONE REPLACEMENT

A. Remove defective portion of existing stone unit. Carefully remove defective portion of stone by making vertical and horizontal saw cuts at face of stone and removing defective material to depth required for fitting partial replacement (dutchman).
   1. Make edges of stone at cuts smooth and square to each other and to finished surface; essentially rectangular. Make back of removal area flat and parallel to stone face.
   2. Do not overcut at corners and intersections. Hand trim to produce clean sharp corners with no rounding and no damage to existing work to remain.
   3. If stone becomes further damaged, remove damaged area and enlarge partial replacement as required.

B. Cut and trim partial replacement to accurately fit area where material was removed from backing stone. Fabricate to size required to produce joints between partial replacement and backing stone of no more than 1/16 inch in width, and to produce joints between partial replacement and other stones that match existing joints between stones.

C. Pinning: Before applying adhesive, prepare for mechanical anchorage consisting of 1/4-inch diameter, stainless-steel pins set into 1/4-inch diameter holes drilled at a 45-degree downward angle through face of partial replacement and into backing stone.
   1. Center and space pins as indicated on structural drawings. Insert pins at least 2 inches in backing stone and 2 inches in partial replacement, with end countersunk at least 3/4 inch from exposed face of partial replacement.

D. Concealed Pinning: Before applying adhesive, prepare for concealed mechanical anchorage consisting of 1/4-inch diameter, threaded stainless-steel pins set into 1/4-inch diameter holes drilled into backing stone and into, but not through, the partial replacement.
   1. Center and space pins between 3 and 5 inches apart and at least 2 inches from any edge. Insert pins at least 2 inches in backing stone and 2 inches in partial replacement, but no closer than 3/4 inch from exposed face of partial replacement.

E. Apply stone-to-stone adhesive according to adhesive manufacturer's written instructions. Coat bonding surfaces of backing stone and partial replacement, completely filling all crevices and voids.

F. Apply partial replacement while adhesive is still tacky, and hold securely in place until adhesive has cured. Use shims, clamps, wedges, or other devices as necessary to align face of partial replacement with face of backing stone.

G. Clean adhesive residue from exposed surfaces and patch chipped areas and exposed drill holes as specified in "Stone Patching" Article.

3.9 STONE PATCHING

A. Patch stone unit on east elevation porch foundation near the grille.

B. Remove porch grill and store in safe location during work. Reinstall upon completion.

C. Remove deteriorated material and remove adjacent material that has begun to deteriorate. Carefully remove the additional materials so patch does not have feathered edges, but has square or slightly undercut edges on area to be patched and is at least ¼” thick, but not less than recommended in writing by patching compound manufacturer

D. Mask adjacent mortar joint or rake out for repointing if patch extends to edge of stone unit.

E. Brush-coat stone surfaces with slurry coat of patching compound according to manufacturer’s written instructions.

F. Place patching compound in layers as recommended in writing by patching compound manufacturer, but not less than ¼” or more than 2 inches thick. Roughen surface of each layer to provide a key for next layer.

G. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plan or contour of the stone. Shape and finish surface before or after curing, as determined by testing, to best match existing stone.

H. Keep each layer damp for 72 hours or until patching compound has set.

I. Remove and replace patches with hairline cracks or that show separation from stone at edges, and those that do not match adjoining stone in color or texture.

J. After mortar has fully hardened, thoroughly clean exposed stone surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, applied by low-pressure spray. Do not use metal scrapers or brushes. Do not use acidic or alkaline cleaners. Clean adjacent non-stone surfaces. Use detergent and soft brushes or cloths. Remove masking materials, leaving no residues that could trap dirt.

3.10 MASONRY CRACK INJECTIONS

A. Limitations:
   1. Cracks must be less than ¼" wide
   2. Cracks must be wide enough to fit the injection syringe (typically 1/16")
   3. Do not install material below 40 degrees F or above 90 degrees F

B. Application:
   1. Install per manufacturer's recommendations
   2. Prepare surfaces
   3. Nautralize salt deposits with distilled water
   4. Dampen with clean water 2-4 hours before application
   5. Mix mortar, per manufacturer recommendations
   6. Prepare mortar, per manufacturer recommendations
   7. Inject DHL into masonry directly into cracks or by brushing the material across the surface of fine cracks.
   8. Fill, per manufacturer recommendations
   9. Clean all tools and surfaces with clean water immediately
   10. Cure for at least 5 days at temperatures above 42 degrees and below 90 degrees F.
   11. Cap cracks with application of custom matched DHL Spachtel. Refer to manufacturer.

3.11 ADJUSTING AND CLEANING

A. In-Progress Cleaning: Clean masonry as work progresses. Remove mortar fins and smears before tooling joints.

B. Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:

   1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
   2. Test cleaning methods on mock-up; leave one-half of panel un-cleaned for comparison purposes.
   3. Clean masonry with specified cleaners applied according to Manufacturer's written instructions per other Specification Sections in the Project Manual.

3.12 EXCESS MATERIALS AND WASTE

A. Disposal as Fill Material: Dispose of clean masonry waste, including mortar and excess or soil-contaminated sand, as directed by the Contractor.

B. Do not dispose of any masonry mortar materials on the site, on buried beneath grade. Do not dispose of effluence from cleaning of mortar mixing equipment on the site or in the parking lot or adjacent street.

END OF SECTION 040120

SECTION 071613 – POLYMER MODIFIED CEMENTITIOUS WATERPROOFING

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. Polymer Modified Latex Cement Waterproofing.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details, installation procedures, testing and inspection procedures, and protection and repairs.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Product Data; Submit manufacture’s technical data sheets, any applicable installation guidelines or recommendations and material safety data sheets for each project included in this specification.

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

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Field quality-control reports.

C. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

A. Contractor Qualifications: The contractor installing the products specified in this section shall have a minimum of 3 years experience and have successfully complete no less than 5 similar projects and have been trained by the manufacturer.

B. Mockups: Build mockups to verify selections made under Sample submittals and to set quality.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages and containers with Seals unbroken and bearing manufacturer’s labels containing brand name, batch or lot numbers and directions for storage and mixing with other components.

B. Store materials to comply with manufacturer’s directions to prevent damage and/or deterioration from moisture, heat, cold, direct sunlight or other detrimental effects.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Comply with all the manufacturer’s directions for maintenance of the ambient and substrate temperature, moisture, humidity, ventilation and other conditions required to execute and protect complete work. In hot and cold weather conditions or when high evaporation rates or adverse conditions may be expected, the contractor will be responsible for the quality of the complete installation.

1.9 WARRANTY

A. Manufacturer's Warranty: Manufacturer's standard materials-only warranty in which manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.

1. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Source Limitations for Waterproofing System: Obtain waterproofing materials single source from single manufacturer.

2.2 POLYMER MODIFIED CEMENTITIOUS WATERPROOFING

A. Polymer Modified Cement Waterproofing: Cementations, two-component, acrylic emulsion base, highly flexible, crack bridging waterproof membrane barrier against positive water pressure.

1. Approved Manufacturer: Miracote Division of Crossfield Projects Corp.

Local Representative: Mike Dickey with Dickey Sales LLC
Phone: 913-557-9105

a. Product: MiraFlex Membrane C

2. Physical Properties:

   a. Color: Selected by architect and owner from the manufactures full range of color.
   b. Dry Component A: Unique Blend of cementations material.
   c. Liquid Component B: White polymer emulsion and admixtures.
   d. Work time: Approximately 30 minutes
   e. Shore A Hardness: ~85
   f. VOC: 0g/L
   g. Bond/Adhesion: 215 psi; ASTM C-321.
   h. Tensile Strength: 750 psi; ASTM D-638.
   i. Elongation: 65%; ASTM S-638.
   j. Crack bridging capacity: 1/8-inch; ASTM E-836.
   k. Vapor Permeability: .75 perms /inch; ASTM E-96.
   l. Waterproofing: Withstands 200 psi = 460 feet hydrostatic pressure at 3/32" thickness.

3. Requests for substitutions will be considered only if submitted to the Architect or Owner in writing and must include substantiation of product performance, 10 days prior to the original bid date.

2.3 ACCESSORY MATERIALS

A. Primer: Clear, single component, odorless water-based, penetrating colloidal silicate liquid primer.

   1. Approved Manufacturer: Miracote Division of Crossfield Projects Corp.

      a. Product: MiraPrime Aqua-Blok XL.

B. Joint and Crack Sealing Fabric:

   1. Approved Manufacturer: Miracote Division of Crossfield Projects Corp.

      a. Product: Miracote Poly Fabric.

C. Patching Compound:

   1. Approved Manufacturer: Miracote Division of Crossfield Projects Corp.

      a. Product: MiraPatch RM2.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the waterproofing.

1. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
2. Verify that compacted subgrade is dry, smooth, sound, and ready to receive waterproofing sheet.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.

3.3 ACRYLIC MODIFIED CEMENTITIOUS WATERPROOFING APPLICATION

A. Fill voids and holes:

1. Fill voids at cleaned and prepared cracks and holes with patching compound in mortar consistency flush to surface.
2. Laminate patching compound in 2 or 3 layers as per manufacturer’s instruction for larger spalled or honeycombed areas.

B. Detailing horizontal and vertical construction joints and cracks: Install joint and crack sealing fabric, embebbed in waterproofing material as follows:

1. Apply two-components waterproofing material by brush in a six to seven inch wide strip coat centered over all joints, cracks, penetrations and changes of plane to be taped.
2. While this coat is still wet, unroll joint sealing tape into the coating and apply a coat of two-component waterproofing material over the tape, smoothing out wrinkles and fish mouths.

C. Prime entire surface per manufacturer’s recommendations.

D. Waterproofing
1. Mix two-component waterproofing material in proportions recommended by manufacturer.
2. Apply two-component waterproofing material in quantities and number of coats as per manufacturer’s specification and recommendation:
3. Apply at 60 mills or 1/16-inch total thickness for all standard applications and waterproofing up to 13 feet water head. 2 coats at 30 mills each.
4. Apply at 80 – 90 mills total thickness for applications exposed to hydrostatic pressure.
5.

E. Surface Finish:

1. Surface shall be standard (regular) two-component waterproofing material finish.

F. Application considerations:
1. Apply, using stainless steel trowel, Tampico brush, short nap rolor or appropriate compressed-air spray equipment.
2. Apply only when surface ambient temperatures are 40°F and rising. At high temperatures (86°F and above) protect application from direct sun and wind to prevent premature surface drying and shrinkage cracks. Apply material in two coats minimum.
3. Application thickness should not exceed 1/8-inch.
4. No not bridge cracks greater than 1/16-inch.
5. Bridge dynamic cracks or joints with elastomeric joint sealing tape, as supplied by waterproofing manufacturer.
6. Do not overcoat waterproofing material with solvent-based material.
7. Prime and protect alkali sensitized metals such as copper, aluminum, galvanized or zinc treated metal fire with a primer, before over-coating with waterproofing material. Follow manufacturer's recommendation for primer material.

3.4 CURING

A. Following manufacturer's general instructions for curing and hardening of waterproofing material. Do not use water for curing. Waterproofing material is self-curing.

B. Protect surfaces from rain, frost and premature dehydration.

3.5 FIELD QUALITY CONTROL

A. Engage a site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish daily reports to Architect and Owner.

B. Flood Testing: Flood test the basin for leaks, according to recommendations in ASTM D 5957, after completing waterproofing but before overlying construction is placed. Install temporary containment assemblies, plug or dam drains, and flood with potable water.

1. Flood to full capacity of the basin.
2. Flood each area for 72 hours.
3. After flood testing, repair leaks, repeat flood tests, and make further repairs until waterproofing installation is watertight.

C. Engage an independent testing agency to observe flood testing and examine underside of decks and terminations for evidence of leaks during flood testing.

D. Prepare test and inspection reports.

3.6 CLEANING

A. Clean work area and remove/discard all debris resulting from the application of the system to the acceptance of the owner.

3.7 PROTECTION

A. Protect all complete work of the application during the specified cure time of the material from pedestrian traffic or any exposure to solid of liquid spillage or any other dorm of contamination.

END OF SECTION 071613

SECTION 079200 - 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. Urethane joint sealants.
2. Polysulfide joint sealants.

1.3 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

B. 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.
4. Joint-sealant color.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.5 FIELD 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 or are below 40 deg F (5 deg C).
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.

1.6 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, 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.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 URETHANE JOINT SEALANTS

A. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
1. BASF Corp
2. Bostik, Inc.
3. Pecora Corporation
4. Sherwin Williams Company
5. Sika
6. Tremco Incorporated

B. Urethane, S, NS, 100/50, T, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Uses T and NT.
1. Sika

C. Urethane, M, NS, 50, NT: Multicomponent, nonsag, plus 50 percent and minus 50 percent movement capability nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade NS, Class 50, Use NT.
   1. Dynatrol
   2. Pecora
   3. Or Equal

2.3 POLYSULFIDE JOINT SEALANTS

A. Polysulfide, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, polysulfide joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
   1. W.R. Meadows, Inc.
   2. Or Equal

2.4 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

A. Primer: Material 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.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

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 performance of the Work.

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 and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Concrete.
    b. Masonry.
    c. Unglazed surfaces of ceramic tile.
    d. Exterior insulation and finish systems.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

    a. Metal.
    b. Glass.
    c. Porcelain enamel.
    d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by 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.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

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. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support 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 sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place 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.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below 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 sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C1193 unless otherwise indicated.
4. Provide flush joint profile at locations indicated on Drawings according to Figure 8B in ASTM C1193.
5. Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C1193.

    a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:

    a. Perform one (1) test for the first 1000 feet (300 m) of joint length for each kind of sealant and joint substrate.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.

    a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

3. Inspect tested joints and report on the following:

    a. Whether sealants filled joint cavities and are free of voids.
    b. Whether sealant dimensions and configurations comply with specified requirements.
    c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind

of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

A. Clean off excess 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.

3.6 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, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

    a. Construction joints in cast-in-place concrete.
    b. Control and expansion joints in unit masonry.
    c. Joints in dimension stone cladding.
    d. Perimeter joints between materials listed above and frames of doors, windows and louvers.
    e. Joints between different materials listed above.
    f. Control and expansion joints in ceilings and other overhead surfaces.
    g. Other joints as indicated on Drawings.
2. Joint Sealant: Urethane, S, NS, 25, NT.
3. Joint Sealant: Urethane, S, NS, 100/50, NT (where needed for more flexibility)
4. Joint Sealant: Urethane, M, NS, 50, NT (where needed in bulk)
5. Joint Sealant: Polysulfide, S, NS, 25, NT (where needed to be sanded)
6. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

B. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:
   a. Control and expansion joints on exposed interior surfaces of exterior walls.
   b. Other joints as indicated on Drawings.
2. Joint Sealant: Urethane, S, NS, 25, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 131163 - MISC. METALS FOR FOUNTAINS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Shop fabricated steel and related items.

B. Resistance welded v-wire screen.

1.2 RELATED SECTIONS

A. Section 03 30 05 - Cast-In-Place Concrete: Placement of metal fabrications in concrete.

1.3 REFERENCES

A. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 1998.

1.4 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

PART 2 PRODUCTS

2.1 MATERIALS

A. Resistance Welded V-Wire Screen:

1. Manufacturer: Resistance welded v-wire screen as manufactured by Hendrick Screen Company; Tel: (270) 685-5138; Fax (270) 685-1729; www.hendrickscreenco.com.

2. Wire and Slot Size:

a. Surface Wire: V-Wire No. 90V.

1) Bar Width: 0.090 inch.

2) Bar Height: 0.150 inch.

b. Slot Opening: 0.125 inch.

c. Open Area: 58 percent.

3. Sheet Size: As indicated on the drawings.

4. Alloy: ASTM A 167, stainless steel Type 304.

2.2 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by intermittent welds and plastic filler.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

F. Handrails:

1. Provide spigots and sleeves to accommodate site assembly and installation.

2. Provide anchors and plates required for connecting railings to structures.

3. Exposed Mechanical Fastenings: Provide flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

4. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.

2.3 FABRICATED ITEMS

A. Resistance Welded V-Wire Screen: As detailed.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.3 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Obtain approval prior to site cutting or making adjustments not scheduled.

D. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

E. Anchor railings securely to structure.

3.4 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION 131163

SECTION 131185 - FOUNTAIN EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Pumps.

B. Basket strainers.

C. Ultraviolet light.

D. Flow measuring devices.

1.2 RELATED SECTIONS

A. Section 131190 - Fountain Piping, Valves, and Related Items: Filter face piping.

1.3 REFERENCES

1.4 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Pumps and Motors: The data and specifications for each unit shall include, but shall not be limited to, the following:

1. Pumps:

a. Name of manufacturer.

b. Type and model.

c. Rotative speed.

d. Size of suction nozzle.

e. Size of discharge nozzle.

f. Net weight of pump.

g. Complete performance curves showing capacity versus head, NPSH required, pump efficiency, and BHP.

2. Motors:

a. Name of manufacturer.

b. Type and model.

c. Type of bearing and lubrication.

d. Rated size of motor, HP.

e. Temperature rating.

f. Full load rotative speed.

g. Net weight.

h. Efficiency at full, 3/4, and 1/2 load.

i. Full load current.

j. Locked rotor current.

C. Product Data: Manufacturer's catalog data, detail sheets, and specifications.

D. Shop Drawings: Prepared specifically for this project; show dimensions of swimming pool equipment and interface with other products.

E. Manufacturer's Instructions: Indicate installation methods and procedures.

F. Operating and Maintenance Data: Operating and maintenance instructions, parts lists, and wiring diagrams.

G. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

A. Perform in accordance with applicable codes and health department regulations , as required for location of project.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than 10 years of documented experience.

C. Supplier's Field Representative: Individual specializing in the start-up and training of the equipment specified in this section, with not less than 5 years experience.

D. Installer Qualifications: Company specializing in performing the work of this section with minimum five years of experience.

E. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

1.6 DELIVERY, STORAGE, AND PROTECTION

A. Deliver materials and equipment to project site in manufacturer's original packaging..

B. Store all materials and equipment under cover and elevated above grade or as instructed by manufacturer.

1.7 WARRANTY

A. See Administrative Requirements for Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.1 END SUCTION CENTRIFUGAL PUMPS (SMALL PUMPS)

A. Specified Manufacturer: Pentair Pools, Integral strainer pump: Tel: (800) 831-7133, www.pentairpool.com.

B. Acceptable Manufacturers:

1. Speck Pumps, Jacksonville, FL, Tel: (800) 223-8538; www.Speck-Pumps.com

C. Pump :

1. Filter and Display Pump: Model IntelliFlo3 VSF

D. Operating Condition: 80 gpm at 70 feet of TDH.

E. Pumps shall be high performance end suction pump meeting the following:

1. Housing: Thermoplastic

2. Shaft: Stainless Steel

3. Performance Criteria: As indicated on the drawings

4. Pumps shall be NSF-50 certified

F. Motor:

1. Size and Speed: Variable Speed- up to 3450 RPM

2. Voltage/Phase: 208 Volt, 3 phase

3. Horsepower: 3HP

G. General:

1. IntelliFlo and IntelliPro pumps shall be provided with Intellicom system when required to be connected to remote Start-Stop-Timers.

2.2 BASKET STRAINER

A. Manufacturers:

1. Specified Manufacturer: Fluidtrol Process Technologies; Series "WEAD SW": Tel: (205) 444-9355; Fax: (205) 444-9356.

2. Acceptable Manufacturer: MerMade Filter; Series "FO" - Full Outlet: Tel: (803) 793-4265.

B. General:

1. Strainer shall be constructed completely of non-corrodible materials.

2. Inlet and outlet to be flanged connections, flange to be 3/4 inch thick drilled to 150# ANSI standard drilling pattern.

3. Stainless steel T-handle bolts are to be built into the top of the strainer body and shall clamp the acrylic cover tightly. Three bolts are immovable while one bolt drops away after loosening knob.

4. The clear lid shall be grooved to allow it to swing open after dropping one toggle.

5. Lid shall be sealed with an "O" ring.

6. The "O" ring seal shall be located in an "O" ring groove in the strainer body.

7. Strainer to be built with an outlet structure to enlarge the opening in the basket chamber. Outlet area of the basket chamber shall be a minimum of four times the area of the inlet pipe.

8. Provide 1/2" PVC FPT vent on lid.

9. Provide PVC NPT winter drain under inlet.

10. Provide 1/4" NPT on outlet arm.

C. Materials of Construction:

1. Body: Fiberglass reinforced plastic (FRP).

2. Lid: Clear acrylic.

3. Eye Bolts: Stainless steel.

4. Hand Knobs: Fiberglass reinforced plastic (FRP) with stainless steel insert.

5. O-Ring: EPDM.

6. Strainer (Basket): 5/32" perforated Type 316 stainless steel having 63% open area.

D. Size: As shown on drawings to match pipe size.

E. Provide one additional stainless steel basket for each basket strainer.

2.3 CARTRIDGE FILTER

A. Manufacturers: Harmsco Filtration Products: Tel: (800)327-3248; Fax: (561)845-2474

B. Model: BetterFilter BF510

C. Filter Tanks:

1. Material Construction: T-304L stainless steel, electropolished.

2. Upflow cartridge design

3. 510 s.f. filtration area

4. 3" NPT connection

5. Max. Operating Pressure: 50 psi

6. Hex Nut Closure

7. EPDM Gasketed Lid Seal, located at top of tank

8. Ten-year, pro-rated warranty

D. Filter Elements:

1. Model HC/170 x 3 filter elements

2. Provide with additional set of 3 replacement filters

2.4 ULTRAVIOLET LIGHT (LOW PRESSURE, HIGH OUTPUT)

A. Specified Manufacturer: Sentry Ultraviolet, Inc.; Model SAG 240; Tel: (866) 226-0820 or (706) 379-2670; Fax: (706) 379-1428; www.sentryuv.com.

B. System shall be capable of providing a dosage of 45 mJ/cm2 at the end of lamp life.

C. Lamps:

1. Type: Low pressure, high output (amalgam).

2. Maximum Lamp Power: 120 watts.

3. Number of Lamps: 2.

4. Lamp Life: 13,000 hours.

D. Chamber:

1. Provide quick disconnects at each sleeve.

2. Maximum Operating Pressure: 50 psi.

3. Connection: Stainless steel flanges.

4. Chamber Material: 316L stainless steel.

5. Provide a drain plug that allows draining the unit for winterization.

6. Provide with a safety cover that when removed turns all lamps off before they can be removed.

E. Control Panel:

1. Power: 120 or 240 volt, as indicated on the electrical drawings.

2. Safety Features:

a. Terminally protected automatically shuts down if abnormal operating temperature are reached.

b. A pressure switch shall shut the system off if the water flow stops.

c. Sensor monitors fowling and loss of 254nm sterilizing wave length. LED lights on control alerts of this condition.

d. Sensor detect lamp outage. Glow fitting on top of lamp will alert of lamp outage.

3. Switch: Lighted on/off switch showing whether power is on or off.

F. Strainer: Provide a strainer for installation downstream of unit to capture broken glass.

2.5 IN-GROUND CHLORINE AND ACID STORAGE TANKS

A. Specified Manufacturer: Fountain People; 4600 Hwy 123 San Marcos, TX 78666; Tel: (512) 392-1155.

B. Double wall seamless linear plythylene construction.

C. Designed for both indoor and outdoor applications.

D. Outer tank wall shall be translucent.

E. Outer containment tank capacity shall comply with federal refulation 40CFR-264.193 requirements.

F. Capacity; Size: 30 gallon; 36 inch diameter by 57 inch height.

G. Provide with adjustable variable chemical feeders, with approximate capacities as follows

1. Chlorine feed: 10 gallons per day

2. pH Feed (acid): 5 gallons per day

H. Fittings and Accessories:

1. Provide fittings as shown on the drawings and as required for a complete and operating system

2. Holes and fittings at or near the bottom of tanks shall not be permitted.

2.6 FLOW MEASURING DEVICES

A. Pitot Tube Flowmeter:

1. Specified Manufacturer: C.W. Cox Company: Tel: (800) 638-8127.

2. Features:

a. Direct reading in gallons per minute (gpm).

b. Gauge fully visible from both sides.

c. Pressures to 250 psi.

d. Scale calibration engraved.

e. All parts hard drawn polished brass and plexiglass.

f. O-ring packed.

g. Accurate precision instrument.

h. One moving part.

i. Operating Capacities: 2 to 10 feet per second.

j. For installation on horizontal or vertical pipe as required.

3. Range:

a. 1-1/2 inch: 10 to 70 gpm.

b. 2 inch: 20 to 100 gpm.

c. 2-1/2 inch: 30 to 150 gpm.

d. 3 inch: 45 to 225 gpm.

e. 4 inch: 80 to 400 gpm.

f. 5 inch: 125 to 625 gpm.

g. 6 inch: 175 to 900 gpm.

h. 8 inch: 300 to 1,600 gpm.

i. 10 inch: 500 to 2,500 gpm.

PART 3 EXECUTION

3.1 EXAMINATION

A. Coordinate with other trades for proper installation of plumbing and electrical services.

B. Verify that required utilities are in correct location and are of correct capacities for specified products.

C. Verify equipment rough-in before proceeding with work.

3.2 INSTALLATION

A. Install swimming pool equipment specified in this section in accordance with manufacturer's printed installation instructions; comply with standards required by authorities having jurisdiction.

B. Schedule installation to ensure that utility connections are achieved in an orderly and expeditious manner.

C. Install equipment plumb, level, square, and straight, without distortion; securely anchor.

3.3 STARTING EQUIPMENT AND SYSTEMS

A. Adjust for proper operation within manufacturer's published tolerances.

B. Provide supplier's field representative to prepare, start, adjust, and demonstrate proper operation of equipment to Owner's designated staff.

3.4 CLEANING

A. Touch up minor damaged surfaces caused by installation.

B. Replace damaged components as directed by Engineer.

C. Clean all equipment.

D. Protect installed equipment from subsequent construction operations.

END OF SECTION 131185

SECTION 131187 - CHEMICAL CONTROLLER

PART 1 GENERAL

1.1 SECTION INCLUDES

A. A programmable chemical automation system for continuous monitoring and control of pH and disinfectant.

1.2 RELATED SECTIONS

A. Section 13 11 85 - Fountain Equipment

1.3 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's descriptive literature for specified systems, including all components.

C. Shop Drawings: Indicate component connection details and details of interface with adjacent construction.

D. Manufacturer's Instructions: Indicate installation instructions for specified equipment, including each component.

E. Operation and Maintenance Data: The manufacturer shall supply a complete instruction, operating and maintenance manual.

F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of experience.

C. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

1.5 DELIVERY, STORAGE, AND PROTECTION

A. Delivery: Deliver materials to site in manufacturer's original, unopened packaging.

B. Storage: Store all equipment and materials under cover and elevated above grade.

C. Protection: Protect equipment and materials to prevent damage.

1.6 WARRANTY

A. The controller shall be covered by a standard manufacturer warranty of five (5) years.

B. All sensors will be covered by a standard one (1) year warranty.

C. Other parts shall be covered by their own manufacturer's warranty.

D. The controller shall not require a service technician for annual calibration, seasonal start up, or whenever chemicals supplier or type are changed.

PART 2 PRODUCTS

2.1 CONTROLLER

A. Manufacturers:

1. Specified Manufacturer: Santa Barbara Control Systems; Model Chemtrol PC2100 Programmable Controller: 5375 Overpass Road, Santa Barbara, CA 93111; Tel: (800) 621-2279; Fax: (805) 683-1893; www.sbcontrol.com.

2. Acceptable Manufacturer: ProMinent Fluid Controls, Inc.; Model: DCM 3 Series; 136 Industry Drive, Pittsburgh, PA 15275; Tel: (412) 787-2484; www.prominent.us.

B. The controller shall automatically activate the appropriate chemical feeders in order to maintain the sanitizer activity level within +/- 10 mV (millivolts) of ORP and the pH within +/- 0.1 pH unit of the setpoints selected by the operator. All setpoint and calibration levels shall be adjustable with a numeric keypad mounted on the front panel of the unit. Controllers with internal switches or calibration adjustments and/or requiring special signal generating equipment to service will not be considered equal.

C. The controller shall include programmable daily and weekly cycles for shocking (superchlorination) and chemical saving level.

D. The controller shall continuously display the Langelier Saturation Index using either sensor data and/or manual input for pH, temperature, total alkalinity and calcium hardness. The resulting calculated water condition shall be displayed on the main screen as either "Scaling", "Corrosive" or "OK".

E. The controller shall be contained in a NEMA Type 3 (rain and splash proof) lockable fiberglass cabinet with an LCD graphic display screen of four (4) lines of twenty (20) alphanumeric characters each. The main display screen shall show the current values, control mode and operational status for ORP, pH and temperature. Controllers with smaller displays or displays that require scrolling through menus will not be considered

equal. All screens shall have the capability of being displayed at any time at the option of the operator in unabbreviated English, French or Spanish and in US or metric units.

F. The controller shall be factory set to water treatment industry standards. The operator shall be able at any time to adjust all programmable functions to preferred settings. The controller shall have a reset mode to reset all or selected functions to the original factory standards.

G. The controller shall have the capability to calibrate all sensor inputs, depending on the accuracy needed, using either 1, 2, or 3-point calibration to determine respectively the origin, slope and curvature of the calibration curve.

H. The controller shall be capable of operating each output in the following operator-selectable modes of operation: automatic, manual, timer or off. In the automatic mode, the operator shall be able to choose between on/off control and proportional feed control based on deviation from setpoint.

I. The controller shall include programmable high and low alarm levels for all control functions with operator selectable feed lockout and alarm buzzer options.

J. The controller shall continuously monitor and alert for probe failure using dynamic probe testing before the water chemistry gets out of range. Failure alarms based only on safety timers and/or out-of-range conditions will not be considered equal.

K. The controller shall record and display the elapsed run time for each activation event and a cumulative run time resettable at any time by the operator. The controller shall provide for operator-adjustable run time limits for all control functions.

L. The controller shall include a battery for memory storage with minimum reserve power for six (6) months of power shutdown.

M. The controller shall have an on-board memory for storing of test data on operator-selectable schedules. An RS-232 serial communications port shall be included for on-site downloading of test data.

N. Options to be provided:

1. ETHCOM: The controller shall include an Ethernet/Internet modem for remote operation by PC-compatible computer using Ethernet/Internet network communications. A Windows-based software program shall be supplied with true duplex operation capability representing the actual controller screen display with automatic downloading and visual graphics representation of test data.

2. Water Temperature: The controller shall monitor and display the water temperature in degrees Fahrenheit or Celsius with adjustable high and low alarms.

3. BPL: A bypass line for installation of the sensors shall be provided with a safety flow switch and a sampling valve for water testing. An in-line filter and flowmeter shall be provided as required by mftr.

4. SCA: The sensors shall be mounted in a see-through flow cell with a clear cover located inside a lockable fiberglass enclosure with a window.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install all equipment in accordance with shop drawings and manufacturer's printed installation instructions; comply with standards required by authorities having jurisdiction.

C. Schedule installation to ensure that utility connections are achieved in an orderly and expeditious manner.

D. Install equipment plumb, square, and straight, without distortion; securely anchor.

3.2 INTERFACE WITH OTHER WORK

A. Coordinate with other trades for proper installation of plumbing.

3.3 STARTING EQUIPMENT AND SYSTEMS

A. Adjust for proper operation within manufacturer's published tolerances.

B. Provide manufacturer's field representative to check-out installation, provide start up, and instruct operating personnel on proper operation and maintenance of equipment.

3.4 ADJUSTING AND CLEANING

A. Adjust equipment, including water requirements, for smooth operation.

B. Touch up minor damaged surfaces caused by installation.

C. Replace damaged components as directed by Engineer.

3.5 CLEANING and PROTECTION

A. Clean all pieces of equipment.

B. Protect installed equipment from subsequent construction operations.

END OF SECTION 131187

SECTION 131190 - FOUNTAIN PIPING, VALVES, AND RELATED ITEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Pipe, pipe fittings, valves, and connections for piping systems.

B. Polyvinyl chloride (PVC) pipe.

C. High Density Polyethylene (HDPE) Pipe.

D. Pipe hangers and supports.

E. Valves.

F. Pressure gauges.

G. Compound pressure gauges.

1.2 RELATED REQUIREMENTS

A. Section 13 11 94 - Fountain Mechanical Identification.

1.3 REFERENCE STANDARDS

A. ASME B16.5 - Pipe Flanges and Flanged Fittings; 1996.

B. ASME B31.9 - Building Services Piping; The American Society of Mechanical Engineers; 2011 (ANSI/ASME B31.9).

C. ASME (BPV IX) - Boiler and Pressure Vessel Code, Section IX - Welding and Brazing Qualifications; The American Society of Mechanical Engineers; 2010.

D. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 1997a.

E. ASTM D 1784 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds; 1999a.

F. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings; 1996 (Reapproved 2010).

G. ASTM F 593 - Standard Specifications for Stainless Steel Bolts, Hex Cap Screws, and Studs; 1998.

H. ASTM F 656 - Standard Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings; 1996a.

I. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers; 1992 (Reapproved 2008).

J. ASTM F 593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs; 2001.

K. ASTM F 594 - Standard Specification for Stainless Steel Nuts; 2001.

L. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2009.

1.4 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Product Data/ Submittals:

1. Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

2. For PVC piping, provide manufacturer's recommended installation procedures, including solvent weld jointing procedures.

C. Project Record Documents: Record actual locations of piping and valves.

D. Training and certification documentation as indicated below.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with applicable codes.

B. Training and Certification: PVC Pipe Installer.

1. PVC piping installers must be trained by manufacturer to install and join piping. Submit written certification from manufacturer for each individual performing pipe installation, prior to installing pipe.

C. Valves: Manufacturer's name and pressure rating marked on valve body.

D. Welding Materials and Procedures: Conform to ASME (BPV IX) and applicable state labor regulations.

E. Identify pipe with marking including size, ASTM material classification, ASTM specification, potable water certification, water pressure rating.

1.6 REGULATORY REQUIREMENTS

A. Perform Work in accordance with local plumbing code.

B. Conform to applicable code for installation of backflow prevention devices.

C. Provide certificate of compliance from authority having jurisdiction indicating approval of installation of backflow prevention devices.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary protective coating on cast iron and steel valves.

C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.8 FIELD CONDITIONS

A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

2.1 HIGH DENSITY POLYETHYLENE (HDPE) PIPE - 2" or smaller

A. Pipe:

1. The resin material will meet the specifications of ASTM D 3350 with a cell classification of PE:345464C.

2. Pipe shall have a manufacturing standard of ASTM D 2737 and D-2239, and meet the requirements of AWWA C901. Pipe shall be NSF SDR-9 (250 psi WPR) unless otherwise specified on the drawings.

3. The pipe shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material.

B. Fittings:

1. Butt Fusion Fittings:

a. Molded and fabricated fittings shall have a pressure rating equal to the pipe unless otherwise specified in the plans.

2. Mechanical Joint Fittings (option for fittings 2" or smaller)

a. Bronze/brass fittings shall have a pressure rating equal to the pipe unless otherwise specified on the drawings.

2.2 HIGH DENSITY POLYETHYLENE (HDPE) PIPE - 3" or larger

A. Pipe:

1. Pipe shall be manufactured from a PE 3408 or PE 3710 resin listed with the Plastic Pipe Institute (PPI) as TR-4.

2. The resin material will meet the specifications of ASTM D 3350 with a cell classification of PE:345464C.

3. Pipe shall have a manufacturing standard of ASTM D 3035 (IPS). Pipe shall be DR 11 (160 psi WPR) unless otherwise specified on the drawings.

4. Casing (if used): Casing shall be DR 17 unless otherwise specified on the drawings.

5. The pipe shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material.

6. All pipes shall be suitable for use as pressure conduits, and per AWWA C901, have nominal burst values of three times the Working Pressure Rating (WPR) of the pipe.

7. Pipe shall also have the listing of NSF 61.

B. Fittings:

1. Butt Fusion Fittings:

a. Fittings shall be PE3408 HDPE, Cell Classification of 345464C as determined by ASTM D 3350, and approved for AWWA use.

b. Butt fusion fittings shall have a manufacturing standard of ASTM D 3261.

c. Molded and fabricated fittings shall have a pressure rating equal to the pipe unless otherwise specified in the plans.

d. Fabricated fittings are to be manufactured using Data Loggers.

e. Temperature, fusion pressure and a graphic representation of the fusion cycle shall be part of the quality control records.

f. All fittings shall be suitable for use as pressure conduits, and per AWWA C906, have nominal burst values of three and one-half times the Working Pressure Rating (WPR) of the fitting.

2. Flanged and Mechanical Joint Adapters:

a. Flanged and mechanical joint adapters shall be PE 3408 HDPE, Cell Classification of 345464C as determined by ASTM D 3350.

b. Flanged and mechanical joint adapters shall have a manufacturing standard of ASTM D 3261.

c. Fittings shall have a pressure rating equal to the pipe unless otherwise specified on the drawings.

2.3 POLYVINYL CHLORIDE (PVC) PIPE

A. PVC Pipe, Schedule 80:

1. Pipe: ASTM D 1785, Cell Classification 12454-B, bearing NSF seal.

2. Fittings: ASTM D 2467, Cell Classification 12454-B, bearing NSF seal.

a. All fittings for pipe diameters less than 16" shall be molded. Fabricated fittings will not be allowed unless approved by Engineer. Contractor shall be responsible for verifying that the use of fabricated fittings will not affect critical dimensional requirements.

b. For pipe diameters of 16" or greater: Fabricated fitting are allowed.

3. Push-on Joints: ASTM F 477 elastomeric gaskets.

4. Solvent Weld Joints:

a. Solvent Cement: ASTM D 2564.

b. Primer: ASTM F 656.

5. Flanges: Diameter and drilling shall conform to ANSI/ASME B16.5, Class 150.

6. Flange Hardware:

a. Bolts: Stainless steel, ASTM F 593, Alloy Group 1 or 2; chamfered or rounded ends projecting 1/8 to 3/8 inch beyond outer face of nut.

b. Nuts: Stainless steel, ASTM F 594, Alloy Group 1 or 2.

c. Flat Washers: Stainless steel, ANSI B18.22.1.

7. Flange Gaskets: Full face, 1/8 inch thick, chemical resistant elastomeric material suitable for the specified service.

B. PVC Pressure-Rated Pipe- Restrained Joint Option:

1. Manufacturer: Certa-lok Yelomine, or approved equal.

2. 4" Pipe, or larger: ASTM D 2241 SDR 21 for 200 psi rating.

3. 3" Pipe or smaller: ASTM D 2241 SDR 17 for 250 psi rating.

4. Fittings: ASTM D 2441, PVC.

5. Jointing: Cert-lok or approved equal

   a. Provide with o-ring jointing system, to provide restrained joints. ASTM D3139 pipe joint standard, ASTM F477 gaskets.

   b. Spline material: Nylon

   c. Below-grade jointing to be permanent-use joints.

2.4 SPECIAL REINFORCED FITTINGS

A. Specified Manufacturer: Spears Manufacturing Company: www.spearsmfg.com.

B. All threaded plastic connections and threaded plastic-to-metal transition connections shall be made with Spears Special Reinforced (SR) Fittings.

C. All fittings shall be Schedule 80 PVC, conforming to ASTM D 2467.

D. All fittings shall be approved for potable water service.

2.5 FLANGES, UNIONS, AND COUPLINGS

A. A union or a flanged connection shall be provided within 2 feet of each threaded end valve unless the valve can be easily removed from the piping.

B. Unions for Pipe Sizes 3 Inches and Under:

   1. Copper tube and pipe: Class 150 bronze unions with soldered joints.

C. Flanges for Pipe Size Over 1 Inch:

   1. Copper tube and pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.

2.6 PIPE SUPPORTS

A. Provide hangers and supports that comply with MSS SP-58.

   1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.

B. Automatic Locking Tube/Pipe Support:

   1. Specified Manufacturer: Litchfield International, Inc.; Product "CLIC" Pipe Hangers; Tel: (800) 345-2542; www.li-clic.com.

   2. Description: Pipe clamp that allows lateral mounting adjustments and automatic locking mechanism.

   3. Material: Polyamide Nylon PA 12.

4. Sizes: For pipe sizes up to 4 inches.

5. Accessories: As required for a complete installation.

6. Anchoring: See Section 05 45 00.

C. Floor Mount Horizontal Strap:

1. Specified Manufacturer: Cooper B-Line; 509 West Monroe Street, P.O. Box 326, Highland, Illinois 62249; Tel: (800) 851-7415; www.cooperindustries.com.

2. Materials:

a. Channel:

1) B-Line Type BFV22SH.

2) Material: Fiberglass.

b. Post Base:

1) B-Line Type B280FL.

2) Material: Steel.

3) Finish: Hot-dipped galvanized.

4) Anchoring Hardware: Self threading bolt anchors as specified in Section 05 45 00.

c. Pipe Strap:

1) B-Line Series BFP2400.

2) Material: Fiberglass.

d. Hardware:

1) Material: Stainless steel type 304 per ASTM F 593.

2) Nut: B-Line Systems, Inc.; Model N225WO.

3. See Section 05 43 00 - Slotted Channel Framing (Strut Systems).

D. Floor Mount Saddle:

1. Specified Manufacturer: Material Resources: Tel: (877) 693-0727; Fax: (503) 693-0636.

2. Provide Model S92 as shown on drawings.

3. Materials:

a. Saddle Strap: ASTM A 36.

b. Collar/Base Cups: ASTM A 53 D.O.M. tubing.

c. Thread Stud: ASTM A 36, rolled thread, grade ASTM A 307.

d. Base Plate: ASTM A 36 sheet steel, 1/4 inch thickness.

4. Fabrication:

a. All Welds: 100 percent MIG welding, electrode E70XX.

b. Saddles: Formed to ductile iron or IPS steel radius.

5. Finish: Corrosion resistant, hot-dipped galvanized.

E. Floor Mount Vertical Clamp:

1. Specified Manufacturer: Cooper B-Line; 509 West Monroe Street, P.O. Box 326, Highland, Illinois 62249; Tel: (800) 851-7415; www.cooperindustries.com.

2. Materials:

a. Channel:

1) B-Line Type BFV22SH.

2) Material: Fiberglass.

b. Post Base:

1) B-Line Type B280FL.

2) Material: Steel.

3) Finish: Hot-dipped galvanized.

4) Anchoring Hardware: Self threading bolt anchors as specified in Section 05 45 00.

c. Pipe Clamp:

1) B-Line Series BFP2400.

2) Material: Fiberglass.

3. See Section 05 43 00 - Slotted Channel Framing (Strut Systems).

F. Floor Mount Vertical Strap:

1. Specified Manufacturer: Cooper B-Line; 509 West Monroe Street, P.O. Box 326, Highland, Illinois 62249; Tel: (800) 851-7415; www.cooperindustries.com.

2. Materials:

a. Channel:

1) B-Line Type BFV22SH.

2) Material: Fiberglass.

b. Post Base:

1) B-Line Type B280FL.

2) Material: Steel.

3) Finish: Hot-dipped galvanized.

4) Anchoring Hardware: Self threading bolt anchors as specified in Section 05 45 00.

c. Pipe Strap:

1) B-Line Series BFP2400.

2) Material: Fiberglass.

d. Hardware:

1) Material: Stainless steel type 304 per ASTM F 593.

2) Nut: B-Line Systems, Inc.; Model N225WO.

3. See Section 05 43 00 - Slotted Channel Framing (Strut Systems).

G. Clamp-Hanger:

1. Specified Manufacturer: Cooper B-Line; 509 West Monroe Street, P.O. Box 326, Highland, Illinois 62249; Tel: (800) 851-7415; www.cooperindustries.com.

2. Materials:

a. Pipe Clamp:

1) B-Line Series B386.

2) Material: Steel.

3) Finish: Hot-dipped galvanized.

b. Pipe Hanger:

1) B-Line Series B1400.

2) Material: Steel.

3) Finish: Hot-dipped galvanized.

3. See Section 05 43 00 - Slotted Channel Framing (Strut Systems).

H. Dual Split Clamp:

1. Specified Manufacturer: Cooper B-Line; 509 West Monroe Street, P.O. Box 326, Highland, Illinois 62249; Tel: (800) 851-7415; www.cooperindustries.com.

2. Materials:

a. Split Pipe Clamp:

1) B-Line Series B3198R.

2) Material: Stainless steel type 304.

3. See Section 05 43 0 - Slotted Channel Framing (Strut Systems).

I. Parallel Strut Strap:

1. Specified Manufacturer: Cooper B-Line; 509 West Monroe Street, P.O. Box 326, Highland, Illinois 62249; Tel: (800) 851-7415; www.cooperindustries.com.

2. Materials:

a. Channel Support:

1) B-Line Type BFV22SH.

2) Material: Fiberglass.

b. Pipe Strap:

1) B-Line Series BFP2400.

2) Material: Fiberglass.

c. U-Bolt:

1) B-Line Series B3501.

2) Material: Steel.

3) Finish: Hot-dipped galvanized.

d. Hex Nut:

1) Size: As required.

2) Material: Steel.

3) Finish: Hot-dipped galvanized.

3. See Section 05 43 00 - Slotted Channel Framing (Strut Systems).

J. Perpendicular Strut Strap:

1. Specified Manufacturer: Cooper B-Line; 509 West Monroe Street, P.O. Box 326, Highland, Illinois 62249; Tel: (800) 851-7415; www.cooperindustries.com.

2. Materials:

a. Channel Support:

1) B-Line Type BFV22SH.

2) Material: Fiberglass.

b. Pipe Strap:

1) B-Line Series BFP2400.

2) Material: Fiberglass.

c. Band:

1) Size: As required.

2) Material: Stainless steel.

3. See Section 05 43 00 - Slotted Channel Framing (Strut Systems).

K. Truss Mount Horizontal Strap:

1. Specified Manufacturer: Cooper B-Line; 509 West Monroe Street, P.O. Box 326, Highland, Illinois 62249; Tel: (800) 851-7415; www.cooperindustries.com.

2. Materials:

a. Pipe Strap:

1) B-Line Series BFP2400.

2) Material: Fiberglass.

3. See Section 05 43 00 - Slotted Channel Framing (Strut Systems).

L. Wall Mount Bracket:

1. Manufacturers: Cooper B-Line; 509 West Monroe Street, P.O. Box 326, Highland, Illinois 62249; Tel: (800) 851-7415; www.cooperindustries.com.

2. Adjustable Strut Bracket: B-Line Systems, Inc.; Model B3064-1-HDG.

a. Material: Steel.

b. Finish: Hot-dip galvanized after fabrication in accordance with ASTM A 123.

c. Dimensions:

1) Vertical Arm: 15 inches.

2) Horizontal Arm: 12 inches.

d. Design Load: 1,200 pounds.

3. Pipe Clamp:

a. Pipe Clamp: B-Line Systems, Inc.; Model B2400-HDG.

b. Material: Steel.

c. Finish: Hot-dip galvanized after fabrication in accordance with ASTM A 123.

4. Hardware:

a. Material: Stainless steel type 304 per ASTM F 593.

b. Nut: B-Line Systems, Inc.; Model N225WO.

c. Hex Head Cap Screws: B-Line Systems, Inc.; Model HHCS.

5. Anchoring Hardware: As specified in Section 05 45 00.

M. Wall Mount Strap:

1. Specified Manufacturer: Cooper B-Line; 509 West Monroe Street, P.O. Box 326, Highland, Illinois 62249; Tel: (800) 851-7415; www.cooperindustries.com.

2. Materials:

a. Channel:

1) B-Line Type BFV22SH.

2) Material: Fiberglass.

b. Pipe Strap:

1) B-Line Series BFP2400.

2) Material: Fiberglass.

c. Anchoring Hardware: As specified in Section 05 45 00.

3. See Section 05 43 00 - Slotted Channel Framing (Strut Systems).

N. Clevis Hangers:

1. Specified Manufacturer: Cooper B-Line; 509 West Monroe Street, P.O. Box 326, Highland, Illinois 62249; Tel: (800) 851-7415; www.cooperindustries.com.

2. Materials:

a. Hot-dipped galvanized steel, adjustable, clevis

b. Hot-dipped galvanized or Type 304 stainless steel heavy duty ceiling flange.

c. Anchoring Hardware: As specified in Section 05 45 00.

O. Plumbing Piping - Water:

1. Conform to ASME B31.9.

2. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.7 PVC BALL VALVES

A. Manufacturers:

1. Spears Manufacturing Company: www.spearsmfg.com.

2. Nibco, Inc; Model U-45TB: www.nibco.com.

3. Hayward Industries, Inc.: www.haywardflowcontrol.com.

B. Construction:

1. True Union type constructed from PVC Type I Cell Classification 12454 conforming to ASTM D 1784.

2. O-rings shall be EPDM.

3. All valves shall have Safe-T-Shear stem and double stop polypropylene handle.

4. All valve union nuts shall have Buttress threads.

5. All valve seal carriers shall be Certified for potable water use by NSF International.

6. All 1/2 inch through 2 inch valves shall be pressure rated at 235 psi and all 2-1/2 inch through 6 inch valves shall be pressure rated at 150 psi for water at 73 degrees F.

2.8 PVC BUTTERFLY VALVES

A. Manufacturers:

1. Specified Manufacturer: Spears Manufacturing Company; Style Wafer or Lug: www.spearsmfg.com.

2. Acceptable Manufacturers:

   a. ASAHI/AMERICA: www.asahi-america.com.

   b. Hayward Industries, Inc.: www.haywardflowcontrol.com.

   c. Nibco, Inc: www.nibco.com.

B. Construction:

1. Valve body and disc shall be constructed from PVC Type I Cell Classification 12454 conforming to ASTM D 1784.

2. Valve seats and O-rings shall be EPDM. Seat shall be a non-liner type interlocked to valve body.

3. Lug Style: Bolt hole patterns shall conform to ANSI/ASME B16.5 CL 150.

4. Wafer Style: Designed for mounting between two flanges having bolt hole pattern that conform to ANSI/ASME B16.5 CL 150.

5. Disc shall be offset design with Type 316 stainless steel stem.

6. Lever operated valves shall be equipped with high impact polypropylene handle having built-in lockout capability.

7. Gear operated valves shall be equipped with position indicator and high impact polypropylene handwheel.

8. All submerged valves shall have submersible gear operators.

9. Valves shall be pressure rated at 150 psi for water at 73 degrees F.

2.9 MECHANICAL FLOAT VALVE

A. Manufacturers:

1. Specified Manufacturer: Fountain People; Model: Mechanical Float Valve (excluding Niche); 4600 Hwy 123 San Marcos, TX 78666; Tel: (512) 392-1155

B. General:

1. 15 gpm maximum flowrate.

2. Mechanically senses for water levels.

C. Materials:

1. Faceplate: white acrylic

2. Brass valve with plastic float

2.10 AIR RELEASE VALVES

A. Specified Manufacturer: A.R.I. USA, Inc.; Model S-050 V: Tel: (559) 269-9653; www.ariusa.com.

B. Materials of Construction:

1. Body: Reinforced Nylon.

2. Discharge Outlet: Polypropylene.

3. Rolling Seal: EPDM.

4. Clamping Stem: Reinforced Nylon.

5. Float: Foamed Polypropylene.

6. O-Ring: NBR 70.

7. Base: Reinforced Nylon.

C. Size: As noted on Drawings.

D. For air release only valves provide with vacuum guard to allow air discharge only, preventing air intake.

2.11 PRESSURE GAUGES

A. Manufacturers:

1. Ashcroft; Model 1009AW.

B. Provide with "PLUS" performance option - liquid filled performance in a dry gauge.

C. Accuracy: 1% full-scale accuracy ASME grade 1A.

D. Construction:

1. Case & Ring Material: 304 stainless steel.

2. Connection: Bronze.

3. Tube Material: Stainless steel.

4. Window: Polycarbonate.

E. Sensing Element: Bourdon tube.

F. Dial Standard: psi.

G. Dial: Brushed aluminum.

H. Dial Size: 3-1/2 inch.

I. Lower Connection: 1/4 inch NPT.

J. Range: 0 to 60 psi.

K. Smallest Gradation: 1 psi.

2.12 COMPOUND PRESSURE GAUGES

A. Manufacturers:

1. Ashcroft; Model 1009AW.

B. Provide with "PLUS" performance option - liquid filled performance in a dry gauge.

C. Accuracy: 1% full-scale accuracy ASME grade 1A.

D. Construction:

1. Case & Ring Material: 304 stainless steel.

2. Connection: Bronze.

3. Tube Material: Stainless steel.

4. Window: Polycarbonate.

E. Sensing Element: Bourdon tube.

F. Dial Standard: psi.

G. Dial: Brushed aluminum.

H. Dial Size: 3-1/2 inch.

I. Lower Connection: 1/4 inch NPT.

J. Range: 30" Hg VAC to 60 psi.

K. Smallest Gradation: 1 psi.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that excavations are to required grade, dry, and not over-excavated.

3.2 PREPARATION

A. Ream pipe and tube ends. Remove burrs.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. To prevent thread galling, apply anti-galling lubricant to all stainless steel hardware.

C. Route piping in orderly manner and maintain gradient. Install piping free of sags, bends, and kinks. Route parallel and perpendicular to walls.

D. Install fittings in changes in direction and branch connections in hard drawn copper tube.

E. All piping within structures shall be arranged, and facilities provided, for complete drainage.

F. Tee fitting sizes shall match that of the largest connecting pipe size.

G. Install piping to maintain headroom, conserve space, and not interfere with use of space.

H. All piping serving metering equipment shall be uniformly graded so that air traps are eliminated and complete venting is provided.

I. Taps for pressure gauge connections on the suction and discharge of pumping units shall be provided with a nipple and a ball type shutoff valve.

J. Buried PVC piping shall be "snaked" in the trench and shall be kept as cool as possible during installation. PVC pipe shall be kept shaded and shall be covered with backfill immediately after installation.

K. All chemical piping shall be installed so that lines are readily accessible for cleaning. Tees shall be provided at changes in direction in all chemical piping except chlorine piping, with extra openings plugged, to facilitate cleaning. Teflon thread tape or teflon thread sealer shall be applied to the threads of the plugs so that they can be easily removed. At each point where hose or reinforced plastic tubing is connected to rigid piping, a quick-disconnect coupling shall be provided.

L. Group piping whenever practical at common elevations.

M. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

N. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 220719.

O. Excavate in accordance with Section 312316.

P. Backfill in accordance with Section 312323.

Q. Install bell and spigot pipe with bell end upstream.

R. Install valves with stems upright or horizontal, not inverted, unless indicated on the plans.

S. Install water piping to ASME B31.9.

T. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.

U. All pipes passing through structures shall be cast-in-place unless specifically noted otherwise on Drawings.

V. Inserts:

1. Provide inserts for placement in concrete formwork.

2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.

4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

W. Pipe Hangers and Supports:

1. Install in accordance with ASME B31.9.

2. Support Schedule 40 PVC and CPVC piping as scheduled following:

a. 1/4" Diameter: Every 3'-0" minimum.

b. 1/2" Diameter: Every 3'-6" minimum.

c. 3/4" Diameter: Every 4'-0" minimum.

d. 1" Diameter: Every 4'-6" minimum.

e. 1-1/4" Diameter: Every 4'-6" minimum.

f. 1-1/2" Diameter: Every 5'-0" minimum.

g. 2" Diameter: Every 5'-0" minimum.

h. 2-1/2" Diameter: Every 5'-6" minimum.

i. 3" Diameter: Every 6'-6" minimum.

j. 4" Diameter: Every 6'-6" minimum.

k. 6" Diameter: Every 7'-6" minimum.

l. 8" Diameter: Every 8'-6" minimum.

m. 10" Diameter: Every 9'-0" minimum.

n. 12" Diameter: Every 9'-6" minimum.

3. Support Schedule 80 PVC and CPVC piping as scheduled following:

a. 1/4" Diameter: Every 4'-0" minimum.

b. 1/2" Diameter: Every 4'-6" minimum.

c. 3/4" Diameter: Every 4'-6" minimum.

d. 1" Diameter: Every 5'-0" minimum.

e. 1-1/4" Diameter: Every 5'-0" minimum.

f. 1-1/2" Diameter: Every 5'-6" minimum.

g. 2" Diameter: Every 6'-0" minimum.

h. 2-1/2" Diameter: Every 6'-0" minimum.

i. 3" Diameter: Every 7'-0" minimum.

j. 4" Diameter: Every 7'-6" minimum.

k. 6" Diameter: Every 9'-0" minimum.

l. 8" Diameter: Every 9'-6" minimum.

m. 10" Diameter: Every 10'-0" minimum.

n. 12" Diameter: Every 11'-6" minimum.

o. 14" Diameter: Every 12'-6" minimum.

4. Place hangers within 12 inches of each horizontal elbow.

5. Provide copper plated hangers and supports for copper piping.

X. High Density Polyethylene (HDPE) Pipe and Fittings:

1. General:

a. All installation specifications above apply to HDPE pipe unless modified herein.

b. Install in accordance with manufacturer's instructions.

c. Fusion and Electrofusion Training: The supplier of the pipe and fittings shall provide a person certified by the pipe manufacturer and the fusion equipment manufacturer to train Contractor's fusion equipment operators and Owner's representatives.

2. Pipe Joining:

a. Butt Fusion Joining:

1) Sections of polyethylene pipe should be joined into continuous lengths on the jobsite above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements of 400 degrees Fahrenheit, alignment, and an interfacial fusion pressure of 75 PSI. The butt fusion joining will produce a joint weld strength equal to or greater than the tensile strength of the pipe itself. All welds will be made using a Data Logger to record temperature, fusion pressure, with a graphic representation of the fusion cycle shall be part of the Quality Control records.

2) Sidewall fusions for connections to outlet piping shall be performed in accordance with HDPE pipe and fitting manufacturer’s specifications. The heating irons used for sidewall fusion shall have an inside diameter equal to the outside diameter of the HDPE pipe being fused. The size of the heating iron shall be ¼ inch larger than the size of the outlet branch being fused.

b. Mechanical Joining:

1) Mechanical joining may be used where the butt fusion method can not be used and only where approved by the Engineer. Mechanical joining will be accomplished by either using a HDPE flange adapter with a Ductile Iron back-up ring or HDPE Mechanical Joint adapter with a Ductile Iron back-up ring.

2) Polyethylene pipe and fittings may be joined together using Flanges or Mechanical Joint (MJ) adapters only where approved by the Engineer. These fittings shall be made from PE 3408 HDPE, with a Cell Classification of 345464C as determined by ASTM D 3350. Flanged and MJ adapters shall have a manufacturing standard of ASTM D 3261. They shall have a pressure rating equal to the pipe.

c. Socket fusion, hot gas fusion, threading, solvents, and epoxies shall not be used to join HDPE pipe.

3. Testing:

a. Pressure testing shall be conducted in accordance with ASTM F 2164, Field Leak Testing of Polyethylene Pressure Piping Systems Using

Hydrostatic Pressure. The HDPE pipe shall be filled with water, raised to test pressure and allowed to stabilize. The test pressure shall be 1.5 times the operating pressure at the lowest point in the system. In accordance with section 9.8, the pipe shall pass if the final pressure is with 5% of the test pressure for 1 hour. For safety reasons, hydrostatic testing only shall be used.

Y. Auxiliary Drill & Tap Connections:

1. Sch 80 fittings may be drilled and tapped for auxiliary connections provided the following limitations are adhered to in order to ensure proper fitting and joint integrity are maintained.

   a. 1/8" and 1/4" tapped connections may be made only on 2" and larger nominal size fittings. 1/2" tapped connections may be made only on 4" and larger fittings. 3/4" tapped connections may be made only on 6" and larger fittings.

   b. Tapped connections must be located in the double-walled solvent cement joint between the fittings and pipe. Do not tap through the fitting wall at any other location.

   c. Tap center must be located at the lower 1/3 of the fittings socket depth. Do not locate tap center in the upper 2/3 of the joint or at the very bottom of the socket.

   d. Drill appropriate pilot hole squarely through the fitting and pipe wall using moderate speed to prevent distortion of the plastic material. Hand tapping is recommended to likewise prevent distortion and possible thread damage. Do not use a drill for tapping.

   e. Tap dry or with water only. Do not use any cutting oils in the tapping process. These can induce stress cracking in plastics.

   f. Threaded connections must be made using a thread sealant as approved by the pipe manufacturer. The use of thread sealants not approved by the pipe manufacturer may cause stress cracking in plastics.

3.4 APPLICATION

A. Install unions downstream of valves and at equipment or apparatus connections.

B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

C. Install gate or ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

D. Install ball or butterfly valves for throttling, bypass, or manual flow control services.

E. Provide plug valves in natural gas systems for shut-off service.

3.5 TOLERANCES

A. When pipe elevations are shown on the Drawings, the pipe shall uniformly slope between the given elevations. If Contractor believes additional change in direction fittings are required in order to achieve the slopes shown, then Contractor shall notify Engineer prior to installation.

B. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/4 inch per foot slope.

C. Water Piping: Slope at minimum of 1/32 inch per foot and arrange to drain at low points.

3.6 PRESSURE AND LEAKAGE TESTING

A. All specified tests shall be made by and at the expense of the Contractor in the presence, and to the satisfaction of the Engineer.

B. Each piping system shall be tested for at least 1 hour and with no loss of pressure.

C. Piping shall be tested at the following pressures:

1. Fountain Piping:

   a. Test Pressure: 1-1/2 times working pressure but not less than 50 psi.

   b. Test Medium: Water.

2. Water Supply:

   a. Test Pressure: 1-1/2 times working pressure but not less than 120 psi.

   b. Test Medium: Water.

3. Other Piping:

   a. Test Pressure: 1-1/2 times working pressure but not less than 50 psi.

   b. Test Medium: Suitable fluid or gas.

D. Compressed air or pressurized gas shall not be used for testing plastic piping unless specifically recommended by the pipe manufacturer.

E. Leakage may be determined by loss-of-pressure, soap solution, chemical indicator, or positive and accurate method acceptable to the Engineer. All fixtures, devices, or accessories which are to be connected to the lines and which would be damaged if subjected to the specified test pressure shall be disconnected and the ends of the branch lines plugged or capped as required during the testing.

F. All necessary testing equipment and materials, including tools, appliances and devices, shall be furnished and all tests shall be made by and at the expense of the Contractor and at the time directed by the Engineer.

G. All joints in piping shall be tight and free of leaks. All joints which are found to leak, by observation or during any specified test, shall be repaired, and the tests repeated.

3.7 CLEANING

A. The interior of all pipe, valves, and fittings shall be smooth, clean, and free of blisters, loose mill scale, sand, dirt, and other foreign matter when installed. Before being placed in service, the interior of all lines shall be thoroughly cleaned, to the satisfaction of the Engineer.

END OF SECTION 131190

SECTION 131194 - FOUNTAIN MECHANICAL IDENTIFICATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Nameplates.

B. Tags.

C. Pipe Markers.

1.2 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.

C. Product Data: Provide manufacturers catalog literature for each product required.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Brady Corporation: www.bradycorp.com.

B. Champion America, Inc.: www.Champion-America.com.

C. Kolbi Pipe Markers, Inc.: www.kolbipipemarkers.com.

D. Marking Services Inc. (MSI): www.markserv.com.

E. Seton Identification Products: www.seton.com/aec.

2.2 NAMEPLATES

A. Description: Laminated three-layer plastic with engraved letters.

2.3 VALVE TAGS

A. Plastic Tags: Laminated three-layer plastic with engraved letters. Tag size minimum 1-1/2 inch diameter.

B. Valve Tag Securing Devices: Plastic zip tie; provide one securing device for each tag.

2.4 PIPE MARKERS

A. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.

PART 3 EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

3.2 INSTALLATION

A. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.

B. Install tags with corrosion resistant chain.

C. Install plastic pipe markers in accordance with manufacturer's instructions.

D. Identify all pumps, pool heaters, pool filters, surge pits, and backwash pits with plastic nameplates. Small devices may be identified with tags if approved by Engineer.

E. Identify all valves in exposed pool recirculation piping and remote pits with tags.

F. Identify exposed piping with plastic pipe markers. Use tags on piping 3/4 inch diameter and smaller. Identify service and flow direction. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.

3.3 SCHEDULES

A. Nameplates:

1. Pool Filters:

a. Identification: Filter No. # (e.g. Filter No. 1, Filter No. 2).

b. Background:

1) Size: As required.

2) Color: Aqua.

c. Lettering:

1) Color: White.

2) Height: 1 inch.

2. Pumps:

a. Identification: "PUMP NAME" Pump (e.g. Main Pool Recirculation Pump, Water Features Pump, Water Slide Pump, etc...)

b. Background:

1) Size: As required.

2) Color: Black.

c. Lettering:

1) Color: White.

2) Height: 1/2 inch.

B. Valve Tags:

1. Identification: Each valve tag shall have the words identified below. Valve tags with codes or abbreviations are not acceptable.

a. Air Release Valve: Located on all ball valves used to release air from hydraulic system.

b. Automatic Air Release Valve: Located on top of filters and at high points of piping system to automatically release air.

c. Bypass Valve: Located on a pump discharge pipe to bypass water flow back into a wet pit.

d. Check Valve: Locate on all check valves.

e. Drain Valve or Drain Plug: Locate on all valves or plugs used for drainage.

f. Filter Effluent Valve: Located on discharge side of filters.

g. Filter Influent Valve: Located on filter face piping directly before filter.

h. Isolation Valve: Located before and after equipment including pumps, strainers, pool heater, etc.

i. Manual Fill Valve: Locate on valve used to fill pool and pit.

j. Drain Valve: Used to drain water out of the basins, generally through the main drain.

k. Recirculation Throttling Valve: Located on recirculation piping after the filters.

l. Solenoid Valve: Valve that is electrically operated.

m. Other: Provide valve tags for all other valves not specifically identified above. Verify wording with Engineer.

2. Background:

a. Size: As required.

b. Color: To match color of pipe markers for the respective pipe - see pipe marker schedule below.

3. Lettering:

a. Color: To match color of pipe markers for the respective pipe - see pipe marker schedule below.

b. Height: 1/4 inch.

C. Pipe Markers: Unless otherwise required by local codes, the color codes for pool piping shall be as follows.

1. Air Release Piping: All piping used to manually or automatically release air.

a. Identification: Air Release.

b. Background:

1) Size: As required.

2) Color:

(a) Piping on filter influent piping or top of filters: Olive Green.

(b) Piping on filter effluent piping: Aqua.

c. Lettering:

1) Color: White.

2) Height: 1/2 inch.

2. Chemical Controller Sample Lines:

a. Chemical Controller Return: Sample coming from the pool chemical controller.

1) Identification: Chemical Controller Return.

2) Background:

(a) Size: As required.

(b) Color: Aqua.

3) Lettering:

(a) Color: White.

(b) Height: 1/2 inch.

b. Chemical Controller Supply: Sample line going to the pool chemical controller.

1) Identification: Chemical Controller Supply.

2) Background:

(a) Size: As required.

(b) Color: Aqua.

3) Lettering:

(a) Color: White.

(b) Height: 1/2 inch.

3. Chemical Piping:

a. Identification: "CHEMICAL NAME" (e.g. Muriatic Acid, Sodium Hypochlorite, Chlorine Gas, Caustic Soda).

b. Background:

1) Size: As required.

2) Color:

(a) Chlorine (gas or solution): Yellow.

(b) Soda Ash: White.

(c) Acid: Pink.

(d) Caustic: Yellow with Green Band.

c. Lettering:

1) Color: Black.

2) Height: 1/2 inch.

4. Domestic Water:

   a. Fill: Locate on all manual fill piping.

      1) Identification: Fountain Fill.

      2) Background:

         (a) Size: As required.

         (b) Color: Dark Blue.

      3) Lettering:

         (a) Color: White.

         (b) Height: 1 inch.

   b. Water Make-Up: Locate on all automatic pool water make-up piping.

      1) Identification: Fountain Basin Water Make Up.

      2) Background:

         (a) Size: As required.

         (b) Color: Dark Blue.

      3) Lettering:

         (a) Color: White.

         (b) Height: 1/2 inch.

END OF SECTION 131194

SECTION 312316.13 - TRENCHING

PART 3 EXECUTION

1.1 EXAMINATION

A. Verify that survey bench marks and intended elevations for the work are as indicated.

1.2 TRENCHING

A. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

B. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.

C. Do not interfere with 45 degree bearing splay of foundations.

D. Cut trenches wide enough to allow inspection of installed utilities.

E. Hand trim excavations. Remove loose matter.

F. Remove excavated material that is unsuitable for re-use from site.

G. Remove excess excavated material from site.

H. Provide temporary means and methods, as required, to remove all water from trenching until directed by the Engineer. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

I. Determine the prevailing groundwater level prior to trenching. If the proposed trench extends less than 1 foot into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by the Engineer.

1.3 PREPARATION FOR UTILITY PLACEMENT

A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.

B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

1.4 BACKFILLING

A. Backfill to contours and elevations indicated using unfrozen materials.

B. Employ a placement method that does not disturb or damage other work.

C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

D. Maintain optimum moisture content of fill materials to attain required compaction density.

E. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

F. Correct areas that are over-excavated.

1. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.

G. Compaction Density Unless Otherwise Specified or Indicated:

H. Reshape and re-compact fills subjected to vehicular traffic.

1.5 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for general requirements for field inspection and testing.

B. See Administrative Requirements, for general requirements for field inspection and testing.

C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D1557 ("modified Proctor"), AASHTO T 180, or ASTM D698 ("standard Proctor").

D. If tests indicate work does not meet specified requirements, remove work, replace and retest.

END OF SECTION 312316.13

SECTION 32 84 00 – PLANTING IRRIGATION

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 SECTION INCLUDES

A. Section Includes:

1. Piping
2. Sprinklers and rotors.
3. Manual valves.
4. Automatic control valves.
5. Transition fittings.
6. Miscellaneous piping specialties.
7. Drip irrigation specialties.
8. Boxes for automatic control valves.
9. Manual drain valves.

1.3 DEFINITIONS

A. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.

B. Drain Piping: Downstream from circuit-piping drain valves. Piping is not under pressure.

C. Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.

D. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

1.4 PERFORMANCE REQUIREMENTS

A. Irrigation zone control shall be automatic operation with controller and automatic control valves.

B. Location of Sprinklers and Specialties: Head-to-head coverage shall be provided for all sprinkler layouts. The system shall be designed to avoid overspray onto buildings, asphalt, and concrete, including walkways. Maintain 100 percent irrigation coverage of areas indicated and make minor adjustments necessary to avoid plantings and obstructions such as signs and light standards.

1. Slopes in excess of a 3 to 1 ratio:

a. Heads placed at the bottom of a slope shall be valved separately.

b. Heads along the mid-point of a slope shall be valved separately.
c. Heads placed on the top of the slope shall be valved separately.
d. Lateral lines on slopes shall be installed along the contour rather than up and down the slopes.

C. Irrigation Zoning: Irrigated areas shall be divided into zones that have the same water requirements such as turf, planting beds, groundcover, etc. Combining planted areas with dissimilar water requirements on a zone is unacceptable. Any irrigation heads in low areas or drainage ways shall be zoned separately. All heads within a given zone must have matched precipitation rates.

D. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties unless otherwise indicated:

1. Irrigation Main Piping: 200 psig
2. Circuit Piping: 200 psig

E. Pipe Sizing: The pipe sizing shall be calculated so that the velocities shall not exceed 5 fps in mainline and lateral pipes.

F. Spray Heads: Pop-up spray heads shall have a pressure regulating device set at the pressure for optimal performance as recommended by the nozzle manufacturer. A manufacturer installed check valve shall be included to reduce low head drainage. Pop-up spray heads for turf areas shall have a minimum pop-up height of 6-inches. 12-inch pop-up height heads will be used in shrubs, ground cover, and flower beds.

G. Irrigation Sleeves: All irrigation piping beneath pavement shall be placed in Schedule 40 PVC sleeves. Sleeves shall be minimum 2-1/2” diameter or twice the diameter of the irrigation line, whichever is larger. Control wires shall be placed in a separate 2-1/2” PVC sleeve.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.6 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Irrigation systems, drawn to scale, on which components are shown and coordinated with each other, using input from Installers of the items involved. Also include adjustments necessary to avoid plantings and obstructions such as signs and light standards.

B. Coordinate first paragraph below with qualification requirements in Section 014000 "Quality Requirements" and as supplemented in "Quality Assurance" Article.

C. Qualification Data: For qualified Installer on site at all times during installation.

D. Zoning Chart: Show each irrigation zone and its control valve.

E. Controller Timing Schedule: Indicate timing settings for each automatic controller zone.

F. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For sprinklers, controllers, and automatic control valves to include in operation and maintenance manuals.

B. As-Built Drawings: Clearly legible drawings noting exact locations of all irrigation components and equipment and any changes to the irrigation construction drawings. Provide in format as requested by Owner.

1.8 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. Sprinklers: Equal to 10 percent of each type and size installed for each type and size indicated, but no fewer than 5 units.'
2. Drip-Tube System Tubing: Equal to 10 percent of total length installed for each type and size indicated, but not less than 100 feet.
2. Remote Control Valves: Equal to 10 percent of each type and size installed on the project, but no fewer than 2 units.
3. Quick Coupler Valves: Furnish 1 extra valve of each type and size installed on the project.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer with a minimum of five consecutive years experience in this area of work and having installed other jobs of similar scope and size. Contractor must have five years experience of installing irrigation systems. Contractor shall provide a minimum of three references and a list of similar projects with the following information: project name, project address, owner's name and contact information.

B. 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.

C. Comply with requirements of local utility supplying water for prevention of backflow and back-siphonage.

D. Comply with requirements of local authority with jurisdiction for irrigation systems.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.11 PROJECT CONDITIONS

A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of water service.
2. Do not proceed with interruption of water service without Owner's written permission.

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

A. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

B. PVC Pipe, Pressure Rated: ASTM D 2241, PVC 1120 compound, SDR 21 for lateral and main lines.

C. PVC Socket Fittings: ASTM D 2466 & 1784, Schedule 40.

D. PVC Threaded Fittings: Use PVC Schedule 80 Nipples and PVC Schedule 40 or 80 threaded fittings conforming to ASTM D 2464 standards for pipe connections.

E. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket or threaded ends.

2.2 PIPING JOINING MATERIALS

A. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F656.

2.3 SPRINKLERS

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. Rain Bird Corporation.
2. Hunter Industries.
3. Or Approved Equal.

B. Description: Manufacturer's standard spray bodies with internal pressure regulator designed to provide uniform coverage over entire area of spray shown on drawings at available water pressure or as follows:

1. Rain Bird Corporation.
2. Hunter Industries.
3. Or Approved Equal.

2.4 SPRINKLER NOZZLES

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. Rain Bird Corporation.
2. Hunter Industries.

3. Or Approved Equal.

B. Description: Manufacturer's matched precipitation rate spray nozzles and multi-stream rotating nozzles designed to provide uniform coverage over entire area of spray shown on drawings at available water pressure.

2.5 MANUAL VALVES

A. Plastic Ball Valves:

1. 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:

   a. Spears Manufacturing Company.

2. Description: Schedule 80 PVC ball valve for use as shut-off or isolation valve on lines up to 3-inches in diameter.

   a. Pressure Rating: 250 psig

2.6 AUTOMATIC CONTROL VALVES

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

1. Rain Bird Corporation: PEB Valve Series.
2. Or Approved Equal.

B. Description: Normally closed 24 VAC solenoid actuated globe pattern design.

1. Valve pressure rating shall not be less than 200 psi.
2. Flow Range: 5 to 200 GPM
3. Inlet Pressure: 20 to 200 psi
4. Valve body shall be constructed of heavy-duty glass-filled UV-resistant nylon and have stainless steel studs and flange nuts; diaphragm shall be of nylon reinforced nitrile rubber.
5. The valve shall have both internal and external manual open/close control (internal and external bleed) for manually opening and closing the valve without electrically energizing the solenoid. The valve's internal bleed shall prevent flooding of the valve box.
6. The valve shall house a fully-encapsulated, one-piece solenoid. The solenoid shall have a captured plunger with a removable retainer for easy servicing and a leverage handle for easy turning. This 24 VAC 50/60 Hz solenoid shall open with 19.6 VAC minimum at 200 PSI (13,8 Bars). At 24 VAC, average inrush current shall not exceed .41 amps. Average holding current shall not exceed 0.28 amps.
7. The valve shall have a brass flow control stem for accurate manual regulation and/or shut-off of outlet flow. The valve must open or close in less than 1 minute at 200 PSI (13,8 Bars) and less than 30 seconds at 20 PSI (1,4 Bars).
8. The valve shall have a self-cleaning stainless steel screen designed for use in dirty water applications.
9. The valve construction shall be such as to provide for all internal parts to be removable from the top of the valve without disturbing the valve installation.
10. The electric remote control plastic valves shall have a pressure regulating module (PRS-D) capable of regulating outlet pressure between 15 and 100 PSI (+/- 3 PSI) (1,04 and

6,90 Bar +/-0,21 Bar). The pressure regulating module shall have an adjusting knob for setting pressure and Schrader valve connection for monitoring pressure. The pressure shall be adjustable from the module when the valve is internally manually bled or electrically activated.

2.7 AUTOMATIC CONTROL ZONE KITS FOR DRIP IRRIGATION

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

1. Rain Bird Corporation: Medium Flow Control Zone Kit (XCZ-100-PRF)
2. Or Approved Equal.

B. Description: Control zone kit assemblies for dripline irrigation zones which include control valve, filtration, and pressure regulating components sized to meet the hydraulic demands and flow requirements of the zones they service.

1. Medium Flow Valve (MFV) component specifications include:

a. Valve body and bonnet constructed of high impact, weather-resistant plastic, stainless steel and other chemical/UV resistant materials
b. Diaphragm with a double-knife seal, constructed of durable Buna-N rubber with a clog-resistant metering orifice
c. Energy-efficient, low-power encapsulated solenoid with captured plunger and 90 mesh (200 micron) solenoid filter
d. External bleed for manual system flushing during start-up, internal bleed for manual zone activation during maintenance operations
e. Inlet pressure rating: 20 to 120 PS (1,4 to 8,3 bar)
f. Female threaded inlet and outlet connections

2. Pressure Regulating Filter (PRF) combines filtration and pressure regulation in one integrated unit for protection of downstream components of drip irrigation system. PRF component specifications include:

a. Compact "Y filter body and cap configuration constructed of glass-filled, UV resistant polypropylene, with 120 PSI (8,3 bar) operating pressure rating. Maximum dimensions of filter body; Height: 4/12" (11, 4 cm), Length: 5/12" (14 cm), Width: 2" (5,1 cm)
b. Standard 200 mesh (75 micron) filter screen constructed of durable stainless steel attached to a polypropylene frame. Screen is serviceable for cleaning purposes by unscrewing cap from filter body and removing filter element.
c. Normally-open pressure regulating device with preset outlet pressure of approximately 30 PSI (2,1 bar). Pressure regulating device allows full flow with minimal pressure loss unless inlet pressure is greater than preset level. As inlet pressure increases above preset level, internal spring compresses to reduce downstream pressure.
d. Male threaded 3/4" (19 mm) inlet and outlet connections.

2.8 DRIP IRRIGATION SPECIALTIES

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. Rain Bird Corporation: XFD On-Surface Dripline & QF Dripline Header

2. Or Approved Equal.

B. Landscape Dripline: Provide flexible dual-layered pressure-compensating inline dripline manufactured with emitter spacing and dripline row spacing as recommended by manufacturer for soil type present on job site.

C. Required dripline tubing material and performance specifications include:

1. XFD tubing; dual-layered, brown in color, conforming to an outside diameter (O.D.) of 0.634 inches (16 mm) and an inside diameter (I.D.) of 0.536 inches (13,6 mm) and wall thickness of 0.049 inches (1,2 mm).
2. Factory installed, pressure-compensating, inline emitters welded to the inner circumference of the polyethylene tubing at spacing specified by model number.
3. Inline emitters designed to pressure-compensate by lengthening the emitter's turbulent flow path.
4. Consistent flow rate from each installed inline emitter when emitter inlet pressure is supplied between recommended operating range of 8.5 to 60 PSI (0,7 to 4,1 bar).
5. Required filtration for XF Series dripline tubing and emitters is 120 mesh (125 micron).

D. Dripline Header: Flexible, pre-manufactured header made of polyethylene tubing and shall have factory installed barbs for use with any 16-17mm drip irrigation tubing. The barbs shall be spaced evenly per listed spacing. The polyethylene tubing shall be either 0.75 inch or 1 inch and work with industry standard fittings for polyethylene tubing, including: lock-style fitting, compression fittings, or insert style fittings (with clamp). The pre-manufactured header should be supplied in 100 foot long coils. The flexible tubing shall allow for easy non-linear installations and conform to a 15 inch radius without kinking.

E. Landscape Dripline Fitting Systems

1. Rain Bird Easy Fit compression fitting material and performance specifications include:

a. Easy Fit directional fittings and flush cap fittings constructed from molded UV-resistant ABS material with Buna-N rubber seal for long-term, leak free connections
b. Easy Fit adapters constructed from UV-resistant ABS materials for use exclusively with Easy Fit Compression Fittings
c. Easy Fit Compression Fittings are intended for use with polyethylene tubing from .630" to 669" (16 mm-17 mm) OD to provide a leak-free compression fit
d. Maximum pressure loss for the Easy Fit adapters estimated to be 0.1 PSI (0,007 bar) per adapter
e. Operating pressure range for Easy Fit compression fittings and adapters is 0 to 60 PSI (0 to 4,1 bar)

2. Rain Bird XF Series insert fitting specifications and features include:

a. Constructed from black and/or brown acetyl plastic for long-term, leak free connections
b. Intended for use with polyethylene tubing with ID of 0.536" (13,6 mm), including Rain Bird XF Dripline and XF Series Blank Tubing
c. Operating pressure range is 0 to 50 PSI (0 to 3,5 bar)

2.9 BOXES FOR AUTOMATIC CONTROL VALVES

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. Pentek (Ametek)
2. Carson Industries LLC.
3. Rain Bird Corporation.

B. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.

1. Size: As required for valves and service.
2. Shape: Round (10” min.) and Rectangular.
3. Sidewall Material: PE, ABS, or FRP.
4. Cover Material: PE, ABS, or FRP, green in color.
5. Lettering: “VALVE BOX.”

C. Drainage Backfill: Cleaned gravel or crushed stone, graded from 3/4 inch (minimum to 3 inches maximum.

2.10 MANUAL DRAINS

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. Buckner manual angle valve
2. Or Approved Equal.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."

B. Install warning tape directly above pressure piping, 12 inches below finished grades, except 6 inches below subgrade under pavement and slabs.

C. Provide minimum cover over top of underground piping according to the following:

1. Irrigation Main Piping: Minimum depth of 24 inches below finished grade.
2. Circuit Piping: Minimum depth of 18 inches below finished grade.
3. Sleeves: Minimum depth of 24" inches below finish grade.

3.2 PREPARATION

A. Set stakes to identify locations of proposed irrigation system. Obtain Owner's approval before excavation.

3.3 PIPING INSTALLATION

A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.

B. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.

C. Install piping free of sags and bends.

D. Install groups of pipes parallel to each other, spaced to permit valve servicing.

E. Install fittings for changes in direction and branch connections.

F. Install unions adjacent to valves and to final connections to other components with NPS 2 or smaller pipe connection.

G. Install flanges adjacent to valves and to final connections to other components with NPS 2-1/2 or larger pipe connection.

H. Install underground thermoplastic piping according to ASTM D 2774.

I. Install expansion loops in control-valve boxes for plastic piping.

J. Lay piping on solid subbase, uniformly sloped without humps or depressions.

K. Install PVC piping in dry weather when temperature is above 40 deg F (5 deg C). Allow joints to cure at least 24 hours at temperatures above 40 deg F (5 deg C) before testing.

L. Install water regulators with shutoff valve and strainer on inlet and pressure gage on outlet. Install shutoff valve on outlet. Install aboveground or in control-valve boxes.

M. Water Hammer Arresters: Install between connection to building main and circuit valves aboveground or in control-valve boxes.

N. Install piping in sleeves under parking lots, roadways, and sidewalks.

O. Install sleeves made of Schedule 40 PVC pipe and socket fittings, and solvent-cemented joints.

3.4 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.

2. PVC Pressure Piping: Join schedule number, ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
3. PVC Nonpressure Piping: Join according to ASTM D 2855.

3.5 VALVE INSTALLATION

A. Remote Control Valves and Quick Coupler Valves: Install in boxes for automatic control valves.

B. Drain Valves: Install in underground piping in boxes for automatic control valves.

3.6 DRIP LINE LAYOUT OF WORK

A. Stake out drip line irrigation system. Items staked include manifold/header pipe and tubing, control zone assemblies, and flush valves.

B. Drip Line Irrigation System Layout Review: Dripline irrigation system layout review will occur after staking has been completed. Notify Owner's Representative one week in advance of review. Modifications will be identified by Owner's Representative at this review.

3.7 DRIP IRRIGATION SPECIALTY INSTALLATION

A. Install drip tubes with direct-attached emitters on ground.

B. Install application pressure regulators and filter units in control-valve boxes.

C. Install flush valves in valve boxes.

3.8 CONNECTIONS

A. Comply with requirements for piping specified in Section 221113 "Facility Water Distribution" for water supply from exterior water service piping, water meters, protective enclosures, and backflow preventers.

B. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.

C. Connect wiring between controllers and automatic control valves.

3.9 IDENTIFICATION

A. Identify system components.

B. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplates and signs on each automatic controller.

1. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

C. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tapes over underground piping during backfilling of trenches. See Section 312000 "Earth Moving" for

warning tapes.

3.10 FIELD QUALITY CONTROL

A. Perform Tests and Inspections:

1. Manufacturer’s Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
3. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Any irrigation product will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.11 STARTUP SERVICE

A. Perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.
2. Verify that controllers are installed and connected according to the Contract Documents.
3. Verify that electrical wiring installation complies with manufacturer's submittal.

3.12 ADJUSTING

A. Adjust settings of controllers.

B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each drip zone.

3.13 CLEANING

A. Flush dirt and debris from piping before installing sprinklers and other devices.

3.14 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain irrigation sprinklers, drip irrigation, manual valves, automatic control valves and controllers.

END OF SECTION

SECTION 32 91 13 – SOIL PREPARATION

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 planting soils specified by composition of the mixes.

1.3 DEFINITIONS

A. AAPFCO: Association of American Plant Food Control Officials.

B. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended or unamended soil as indicated.

C. CEC: Cation exchange capacity.

D. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.

E. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus

F. Finish Grade: Elevation of finished surface of planting soil.

G. Imported Soil: Soil that is transported to Project site for use.

H. Layered Soil Assembly: A designed series of planting soils, layered on each other, that together produce an environment for plant growth.

I. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.

J. NAPT: North American Proficiency Testing Program. An SSSA program to assist soil-, plant-, and water-testing laboratories through interlaboratory sample exchanges and statistical evaluation of analytical data.

K. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."

L. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

M. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.

N. SSSA: Soil Science Society of America.

O. 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.

P. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

Q. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.

R. USCC: U.S. Composting Council.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include recommendations for application and use.
2. Include test data substantiating that products comply with requirements.
3. Include sieve analyses for aggregate materials.
4. Material Certificates: For each type of imported soil and soil amendment and fertilizer before delivery to the site, according to the following:

    a. Manufacturer's qualified testing agency's certified analysis of standard products.
    b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.
    c. Analysis of nonstandard materials, by a qualified testing agency, made according to SSSA methods, where applicable.

B. Samples: For each bulk-supplied material, 1-gal. volume of each in sealed containers labeled with content, source, and date obtained. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of composition, color, and texture.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For each testing agency.

B. Preconstruction Test Reports: For preconstruction soil analyses specified in "Preconstruction Testing" Article.

C. Field quality-control reports.

1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction soil analyses on existing, on-site soil and imported soil.

1. Notify Landscape Architect seven days in advance of the dates and times when laboratory samples will be taken.

B. Preconstruction Soil Analyses: For each unamended soil type, perform testing on soil samples and furnish soil analysis and a written report containing soil-amendment and fertilizer recommendations by a qualified testing agency performing the testing according to "Soil-Sampling Requirements" and "Testing Requirements" articles.

1. Have testing agency identify and label samples and test reports according to sample collection and labeling requirements.

1.9 SOIL-SAMPLING REQUIREMENTS

A. General: Extract soil samples according to requirements in this article.

B. Sample Collection and Labeling: Have samples taken and labeled by Contractor in presence of Owner under the direction of the testing agency.

1. Number and Location of Samples: Minimum of three representative soil samples from varied locations for each soil to be used or amended for landscaping purposes.
2. Procedures and Depth of Samples: According to USDA-NRCS's "Field Book for Describing and Sampling Soils."
3. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to Owner for its records.
4. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.

1.10 TESTING REQUIREMENTS

A. General: Perform tests on soil samples according to requirements in this article.

B. Physical Testing:

1. Soil Texture: Soil-particle, size-distribution analysis by one of the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":

a. Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.
b. Hydrometer Method: Report percentages of sand, silt, and clay.

2. Total Porosity: Calculate using particle density and bulk density according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
3. Water Retention: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
4. Saturated Hydraulic Conductivity: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods"; at 85% compaction according to ASTM D 698 (Standard Proctor).

C. Chemical Testing:

1. CEC: Analysis by sodium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."
2. Clay Mineralogy: Analysis and estimated percentage of expandable clay minerals using CEC by ammonium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 1- Physical and Mineralogical Methods."
3. Metals Hazardous to Human Health: Test for presence and quantities of RCRA metals including aluminum, arsenic, barium, copper, cadmium, chromium, cobalt, lead, lithium, and vanadium. If RCRA metals are present, include recommendations for corrective action.
4. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.

D. Fertility Testing: Soil-fertility analysis according to American Society for Testing and Materials (ASTM) testing protocols including the following:

1. Percentage of organic matter.
2. CEC, calcium percent of CEC, and magnesium percent of CEC.
3. Soil reaction (acidity/alkalinity pH value).
4. Buffered acidity or alkalinity.
5. Nitrogen ppm.
6. Phosphorous ppm.
7. Potassium ppm.
8. Manganese ppm.
9. Manganese-availability ppm.
10. Zinc ppm.
11. Zinc availability ppm.
12. Copper ppm.
13. Sodium ppm and sodium absorption ratio.
14. Soluble-salts ppm.
15. Presence and quantities of problem materials including salts and metals cited in the Standard protocol. If such problem materials are present, provide additional recommendations for corrective action.
16. Other deleterious materials, including their characteristics and content of each.

E. Organic-Matter Content: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."

F. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory planting soil suitable for healthy, viable plants indicated. Include, at a minimum, recommendations for nitrogen, phosphorous, and potassium fertilization, and for micronutrients.

1. Fertilizers and Soil Amendment Rates: State recommendations in weight per 1,000 sq. ft. (100 sq. m) for 6-inch (150-mm) depth of soil.

2. Soil Reaction: State the recommended liming rates for raising pH or sulfur for lowering pH according to the buffered acidity or buffered alkalinity in weight per 1,000 sq. ft. (100 sq. m) for 6-inch (150-mm) depth of soil.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance 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. Do not move or handle materials when they are wet or frozen.
4. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Regional Materials: Imported soil and soil amendments and fertilizers shall be manufactured within 100 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 100 miles (800 km) of Project site.

2.2 PLANTING SOILS SPECIFIED BY COMPOSITION

A. General: Soil amendments, fertilizers, and rates of application specified in this article are guidelines that may need revision based on testing laboratory's recommendations after preconstruction soil analyses are performed.

B. Planting-Soil Type: Existing, on-site surface soil, with the duff layer, if any, retained and stockpiled on-site; modified to produce viable planting soil. Blend existing, on-site surface soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

1. Ratio of Loose Compost to Soil: 1:4 by volume.

C. **Annual Planting Soil Type: Imported, naturally formed soil from off-site sources and consisting of silty clay loam according to USDA textures; and modified to produce viable planting soil.**

1. Sources: Take imported, unamended soil from sources that are naturally well-drained sites where topsoil occurs at least 4 inches (100 mm) deep, not from agricultural land, bogs, or marshes; and that do not contain undesirable organisms; disease-causing plant pathogens; or obnoxious weeds and invasive plants including, but not limited to, quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and bromegrass.

2. Additional Properties of Imported Soil before Amending: Soil reaction of pH 5.5 to 7.5 and minimum of 4 percent organic-matter content, friable, and with sufficient structure to give good tilth and aeration.
3. Unacceptable Properties: Clean soil of the following:

    a. Unacceptable Materials: 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.
    b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand.
    c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 1 inch in any dimension.

2.3 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 a No. 8 (2.36-mm) sieve and a minimum of 75 percent passing through a No. 60 (0.25-mm) sieve.
2. Class: O, with a minimum of 95 percent passing through a No. 8 (2.36-mm) sieve and a minimum of 55 percent passing through a No. 60 (0.25-mm) sieve.
3. Form: Provide lime in form of ground dolomitic limestone.

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 (3.35-mm) sieve and a maximum of 10 percent passing through a No. 40 (0.425-mm) sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Perlite: Horticultural perlite, soil amendment grade.

E. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through a No. 50 (0.30-mm) sieve.

F. Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C 33/C 33M.

2.4 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:

1. Feedstock: Limited to leaves.
2. Reaction: pH of 5.5 to 8.
3. Soluble-Salt Concentration: Less than 4 dS/m.
4. Moisture Content: 35 to 55 percent by weight.
5. Organic-Matter Content: 50 to 60 percent of dry weight.
6. Particle Size: Minimum of 98 percent passing through a 1/2-inch (13-mm) sieve.

PART 3 - EXECUTION

3.1 GENERAL

A. 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 planting soil.

B. Proceed with placement only after unsatisfactory conditions have been corrected.

3.2 PREPARATION OF UNAMENDED, ON-SITE SOIL BEFORE AMENDING

A. 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.

B. Unsuitable Materials: Clean soil of stones, roots, plants, sod, clay lumps, and pockets of coarse sand.

C. Screening: Pass unamended soil through a 1-inch sieve to remove large materials.

3.3 PLACING AND MIXING PLANTING SOIL OVER EXPOSED SUBGRADE

A. General: Apply and mix unamended soil with amendments on-site to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Subgrade Preparation: Till subgrade to minimum depth of 6 inches for turf areas. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Apply, add soil amendments, and mix approximately half the thickness of unamended soil over prepared, loosened subgrade according to "Mixing" Paragraph below. Mix thoroughly into top 4 inches (100 mm) of subgrade. Spread remainder of planting soil.

C. Mixing: Spread unamended soil to total depth of 4 inches but not less than required to meet finish grades after mixing with amendments and natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.

1. Amendments: Apply soil amendments, except compost, and fertilizer, if required, evenly on surface, and thoroughly blend them with unamended soil to produce planting soil.

a. Mix lime and sulfur with dry soil before mixing fertilizer.
b. Mix fertilizer with planting soil no more than seven days before planting.

2. Lifts: Apply and mix unamended soil and amendments in lifts not exceeding 12 inches in loose depth for material compacted by compaction equipment, and not more than 6 inches in loose depth for material compacted by hand-operated tampers.

D. Compaction: Compact each blended lift of planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D 698 and tested in-place.

E. 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.

F. Establish finish grade before September 15th.

G. Obtain Landscape Architect's acceptance of finish grade; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 APPLYING COMPOST TO SURFACE OF PLANTING SOIL

A. Application: Apply compost component of planting-soil mix to surface of in-place planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Finish Grading: Grade surface to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Contractor, at no expense to the Owner, will engage a qualified testing agency to perform code required tests and inspections.

B. Perform the following tests and inspections:

1. Compaction: Test planting-soil compaction after placing each lift and at completion using a densitometer or soil-compaction meter calibrated to a reference test value based on laboratory testing according to ASTM D 698. Space tests at no less than one for each 1,000 sq. ft. of in-place soil or part thereof.

C. Soil will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. Label each sample and test report with the date, location keyed to a site plan or other location system, visible conditions when and where sample was taken, and sampling depth.

3.6 PROTECTION

A. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:

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

B. If planting soil or subgrade is overcompacted, disturbed, or contaminated by foreign or deleterious materials or liquids, remove the planting soil and contamination; restore the subgrade as directed by Landscape Architect and replace contaminated planting soil with new planting soil.

3.7 CLEANING

A. Protect areas adjacent to planting-soil preparation and placement areas from contamination. Keep adjacent paving and construction clean and work area in an orderly condition.

B. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated.

END OF SECTION

SECTION 32 93 00 - 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. Soil amendments.
3. Landscape edgings.
4. Fertilizers.

B. Related Sections:

1. Section 32 91 13, SOIL PREPARATION.
2. MODot Section 805, Seeding

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required.

D. 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.

E. 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.

F. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

G. Finish Grade: Elevation of finished surface of planting soil.

H. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

I. 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.

J. Planting Area: Areas to be planted.

K. 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.

L. 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.

M. 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.

N. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

O. 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.

P. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

Q. 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 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. Herbicides: Include product label and manufacturer's application instructions specific to the Project.

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

1. Trees and Shrubs: One sample of each variety and size delivered to the site for review. Maintain approved samples on-site as a standard for comparison.
2. Organic 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.
3. Edging Materials and Accessories: Manufacturer's standard size, to verify color selected.

C. 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.

D. 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.

E. Material Test Reports: For existing in-place surface soil and imported or manufactured topsoil. Refer to Specification Section 329113 Soil Preparation.

F. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before start of required maintenance periods.

G. Warranty: Written statement of warranty.

1.5 QUALITY ASSURANCE

A. The Contractor shall provide a field supervisor who shall meet the required qualifications:

1. A minimum of an Associates of Applied Science Degree in Horticulture, Botany, Soil Physics, Agronomy, General Agriculture, Agricultural or Biological Engineering, or a related field.

2. A minimum 5 years experience of work similar in material, design, and extent to that indicated for this project.

3. The above-described individual(s) shall be on the project during the following work: planting activities and a minimum of two days per month during plant establishment, except during winter dormancy, for review of grass stand and determination of establishment activities to conduct for that review interval.

B. Soil-Testing Laboratory Qualifications: Refer to specification Section 329113 Soil Preparation.

C. Soil Analysis: Refer to specification Section 329113 Soil Preparation.

D. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

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: Owner's Representative 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. Owner's Representative 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 Owner's Representative of sources of planting materials seven days in advance of delivery to site.

G. Preinstallation Conference: Conduct conference at Project site.

1.6 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 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, lime, 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.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Trees and Shrubs: Spring Planting - February 15 to May 31.
2. Trees and Shrubs: Fall Planting - September 15 to November 30.
3. Perennials: Spring Planting - May 1 to June 15.
4. Perennials: Fall Planting - September 1 to October 15.

C. 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 and warranty requirements.

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.

1.8 WARRANTY

A. 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 and edgings.
d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods from Date of Substantial Completion:

a. Trees and Shrubs: 1 year.
b. Ground Covers, Perennials, and Other Plants: 1 year.

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.

1.9 MAINTENANCE SERVICE

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. Maintenance Period: 1 year from date of Substantial Completion.

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: **1 years** from date of Substantial Completion.

PART 2- PRODUCTS

2.1 PLANT MATERIAL

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 Owner's Representative, 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 at least one 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 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, and containing a minimum of 90 percent sulfur, 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.

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.

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 1/2-inch (13-mm) sieve; soluble salt content of less than 2.5 mmho/cm; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 70 percent of dry weight.
2. Feedstock: Agricultural, food, or industrial residuals; biosolids; or source-separated or compostable mixed solid waste.

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or 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. 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, debris, and material harmful to plant growth.

2.4 FERTILIZERS

A. Bonemeal: Commercial, raw, or steamed, finely ground; a minimum of 4 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:

1. 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: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

E. 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: 21-gram tablets.
2. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

F. Chelated Iron: Commercial-grade FeEDDHA for dicots and woody plants, and commercial-grade FeDTPA for ornamental grasses and monocots.

2.5 PLANTING SOILS

REFER TO SPECIFICATION SECTION 329113 SOIL PREPARATION.

2.6 MULCHES

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

1. Type: Double-ground hardwood.
2. Size Range: 3 inches (76 mm) maximum, 1/2 inch (13 mm) minimum.
3. Color: Natural.

2.7 HERBICIDES

A. 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.

B. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

2.8 LANDSCAPE EDGINGS

A. Steel Edging: Refer to Plans for Locations. Standard commercial-steel edging, rolled edge, fabricated in sections of standard lengths, with loops stamped from or welded to face of sections to receive stakes.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Border Concepts, Inc.
b. Collier Metal Specialties, Inc.
c. Russell, J. D. Company (The).

2. Edging Size: 3/16 inch thick by 4 inches (150 mm) wide.
3. Stakes: Tapered steel, a minimum of 12 inches (300 mm) long.
4. Accessories: Standard tapered ends, corners, and splicers.
5. Finish: Hot-dipped galvanized.
6. Paint Color: Black

2.9 MISCELLANEOUS PRODUCTS

A. 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.

B. Burlap: Non-synthetic, biodegradable.

C. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5,300 spores per pound (0.45 kg) of vesicular-arbuscular mycorrhizal fungi and 95 million spores per pound (0.45 kg) of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

PART 3- EXECUTION

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 Owner's Representative and replace with new planting soil.

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 Owner's Representative's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. 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.

E. 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.

3.3 PLANTING AREA ESTABLISHMENT

A. Loosen subgrade of planting areas to a minimum depth of 6 inches (150 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 of Owner's property.

1. Apply superphosphate fertilizer directly to subgrade before loosening.
2. 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 4 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.

    a. Spread approximately one-half the thickness of planting soil over loosened subgrade. Mix thoroughly into top 4 inches (100 mm) of subgrade. Spread remainder of planting soil.

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 Owner's Representative's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

D. Application of Mycorrhizal Fungi: As directed by the Owner's Representative, broadcast dry product uniformly over prepared soil at application rate indicated by product manufacturer.

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 balled and burlapped 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.

B. Subsoil and topsoil removed from excavations may be used as planting soil.

C. Obstructions: Notify Owner's Representative if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

D. Drainage: Notify Owner's Representative if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

3.5 TREE AND SHRUB 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. Carefully remove root ball from container without damaging root ball or plant.
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. 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 TREE AND SHRUB PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Owner's Representative, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

C. Do not apply pruning paint to wounds.

3.7 PLANTING AREA MULCHING

A. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Trees and Tree-like Shrubs in Turf Areas: Apply organic mulch ring of 3-inch (75-mm) average thickness, with 36-inch (900-mm) radius around trunks or stems. Do not place mulch within 3 inches (75 mm) of trunks or stems.
2. Organic Mulch in Planting Areas: Apply 3-inch (75-mm) average thickness of organic mulch extending 12 inches (300 mm) beyond edge of individual planting pit or trench and 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.

3.8 EDGING INSTALLATION

A. Steel Edging: Install steel edging where indicated according to manufacturer's written instructions. Anchor with steel stakes spaced approximately 30 inches (760 mm) apart, driven below top elevation of edging.

3.9 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 pest 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.

3.10 HERBICIDE APPLICATION

A. Apply herbicides 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.

3.11 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.

3.12 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

SECTION 33 05 07 - HORIZONTAL DIRECTIONAL DRILLING

PART 1 – GENERAL

1.1 Work included but not necessarily limited to installation of underground water mains and service lines by use of Horizontal Directional Drilling (HDD) methods and technology.

1.2 RELATED SECTIONS.

A. 131190 Fountain Piping, Valves, and Related Items

1.3 QUALITY ASSURANCE.

A. HDD Experience

1. Contractor or Sub-Contractor actively engaged in HDD projects for a minimum of 3 years.
2. Field supervisory personnel and equipment operators with a minimum of 3 years of experience on similar type projects.

1.4 SUBMITTALS.

A. Compliance submittals.

1. Includes, but not limited to the following:
   a. Contractor and/or Sub-Contractor’s relevant experience resume for projects completed within the last 5 years. Include the following minimum project information: owner’s name, project name, date and duration of work, location, pipe information, contents handled by pipeline and HDD equipment used.
   b. Qualifications and relevant HDD experience of key personnel who will be supervising and operating the HDD equipment.
   c. HDD equipment proposed for use on the project.
   d. The Contractor shall submit for approval a directional drilling plan showing the location of their proposed entry and exit pit locations and sequence of work.
2. Provide submittals per requirements of Division 01.

PART 2 PRODUCTS

2.1 PIPING MATERIALS

1. All pipe installed using HDD shall be as shown on the drawings and as specified in Section 13 11 90.
2. Tracer wire shall be installed with the pipe.

2.2 DRILLING FLUID

1. Bentonite drilling mud compatible with the piping material and environment.
2. Waste oil or environmentally non-compatible polymers shall not be used.

PART 3 EXECUTION

3.1 PREPARATION

A. Excavate pits as needed and at locations shown on the drawings or as approved by the Owner and Engineer.

B. Provide equipment to guard against electrocution and an alarm system on drilling equipment capable of detecting electrical current as it approaches electric lines.

C. Pot Hole underground utilities crossing the drill path before HDD operation.

3.2 OPERATION

A. General.

1. Determine drilling length and equipment pull strength for type of soil encountered.
2. Provide method to control line and grade.
3. Provide and maintain instrumentation that accurately locates pilot hole.
4. Drill pilot hole along path to maintain tolerance of plus or minus 0.50 feet vertical and plus or minus 1.0 feet horizontal.
5. Include electronic monitoring of horizontal and vertical drilling head location. Obtain accuracy range within 1-inch of actual position of pipeline. Record depth readings at maximum 10-foot intervals.
6. At completion of pilot hole drilling, furnish the Resident Project Representative tabulations of the vertical depth logs.

B. Site Restrictions

1. HDD operations along and parallel to the road right-of-way can be completed with conventional surface launched drilling equipment.

C. When water is encountered.

1. Provide and maintain dewatering system of sufficient capacity to remove water.
2. Keep excavation free of water until backfill operation is in progress.
3. Perform dewatering in such a manner that removal of soils particles is held to a minimum.

D. Maintain close observation to detect settlement or displacement of surface and adjacent facilities.

1. Notify Contract Manager and applicable agency immediately if

settlement or displacement is detected.

2. Maintain safe conditions and prevent damage.

E. Drilling Operation.

1. Maintain drilling fluid in bore hole to increase stability of surrounding soil and reduce drag on pulled pipe.
2. Dispose of drilling fluid and other spoils at location following laws, ordinances, rules, and regulations of local jurisdiction.
3. Transport excess fluids and other spoils to disposal site.
4. Minimize drilling fluid at locations other than entry and exit points. Immediately clean up any drilling fluids that inadvertently surface.
5. Provide clean water for drilling.
6. Angle entry hole so that curvature of pilot hole does not exceed allowable bending radius of the pipe.
7. Be able to make a turn of up to 90 degrees and maintain a curvature not to exceed allowable bending radius of the pipe.
8. Equipment must be capable of boring the following lengths in a single bore.

F. Installation

1. Pipe to be a minimum of 42 inches below finish grade.
2. Provide a swivel to reaming assembly and pull section of pipe to minimize torsional stress on pull section after drilling pilot hole.
3. Hold reaming diameter to 1.5 times outside diameter of the pipe being installed.
4. Protect pull section as it proceeds during pull back so it moves freely and is not damaged.
5. Pull detection wire along with water pipe. Extend wire to connection points at each end.
6. When connecting to adjacent pulled or non-pulled section of PVC pipe, allow pull section of pipe to extend past termination point. Make tie-ins the next day after pullback of PVC pipe.
7. Test pit pipe installation to verify horizontal and vertical alignment.
    a. One test pit for every 500 feet along length of pipeline.
    b. The Resident Project Representative may order additional test pit for each test pit that reveals pipeline installation is not in compliance with Contract Documents.

END OF SECTION