

## **Solicitation 12196-193**

# **Peele-Dixie W. T. P. Chemical Tank Replacements and Degasifier Imp P12295**

**Bid Designation: Public**



**City of Fort Lauderdale**

**Bid 12196-193****Peele-Dixie W. T. P. Chemical Tank Replacements and Degasifier Imp P12295**

Bid Number	12196-193
Bid Title	Peele-Dixie W. T. P. Chemical Tank Replacements and Degasifier Imp P12295
Bid Start Date	Mar 15, 2019 2:00:14 PM EDT
Bid End Date	Jun 4, 2019 2:00:00 PM EDT
Question & Answer End Date	May 23, 2019 5:00:00 PM EDT
Bid Contact	Fausto Vargas Procurement Specialist Finance - Procurement Division fvargas@fortlauderdale.gov
Contract Duration	One Time Purchase
Contract Renewal	Not Applicable
Prices Good for	120 days
Pre-Bid Conference	Apr 10, 2019 11:00:00 AM EDT Attendance is optional Location: 1500 South State Road 7 Fort Lauderdale, FL 33312
Bid Comments	<b><u>INVITATION TO BID</u></b>

Sealed bids will be received electronically until 2:00 P.M., local time, on Monday, April 22th, 2019, and opened immediately thereafter in the 5th Floor Conference Room, City Hall, City of Fort Lauderdale, Florida, 100 North Andrews Avenue, for BID NO., 12196-193, PROJECT NO., 12295 Peele-Dixie Water Treatment Plant Chemical Tank Replacements and Degasifier Improvements.

This project consists of Drawing File No. 4-141-34 (38) sheets.

This project is located at 1500 South State Road 7, in the City of Fort Lauderdale. The work to be accomplished under this contract includes: the furnishing of all labor, equipment, and materials for removal and replacement of three, 11,500 gallon and one 950 gallon fiberglass sodium hypochlorite storage tanks and removal, disposal and replacement of degasifier media and installation of a degasifier media cleaning system. This project includes procurement, construction, testing, and placing in service, the equipment and materials shown on the Drawings and/or described in the Specifications. All materials, components and chemicals in contact with water in the treatment process must be NSF approved or Food Grade. In general terms, this project includes the following project elements covered by these Contract Documents: Relocate an exhaust fan, interior lights, conduits, wiring and supports out of the way of the work, Remove and dispose of existing removable concrete block wall panel measuring approximately 14 feet by 14 feet, Install a bifold door across the wall panel opening, Remove and dispose of existing chemical bulk storage and day tanks, including piping to the transfer pumps, Remove and replace the coating in the containment area for the sodium hypochlorite tanks, Install new chemical bulk storage and day tanks with all piping, connect to the transfer pumps, and provide startup services, Remove and dispose of the piping for the City's existing temporary sodium hypochlorite system, including wall brackets and supports, Restore the south wall of the chemical building, including repair of damage resulting from the work, patching penetrations and holes resulting from removal of the temporary hypochlorite piping, checking the entire

surface of the south wall for areas of delaminated stucco, replacing areas of delaminated stucco and painting the entire exterior south wall of the chemical building,  
Remove and replace degasifier media from two degasifiers, keeping one degasifier in service,  
Clean the interior of each degasifier and test and restart each degasifier keeping one degasifier and  
Install a degasifier media cleaning system to serve both degasifiers, keeping one degasifier in service and test and start up the degasifier media cleaning system.

**NOTE: Payment on this contract will be made by Visa or MasterCard.**

**Licensing Requirements:** Contractor certified by State of Florida to perform the work specified in the scope. Must possess State of Florida General Contractor's License.

**Pre-Bid Meeting/Site visit:** A pre-bid meeting and/or site visit will be held on Monday, March 25th, 2019, at 11:00 a.m., local time, at 1500 South State Road 7, Fort Lauderdale, FL 33312 (Peele-Dixie Water Treatment Plant Site).

It is **strongly suggested** that all Contractors attend the pre-proposal conference and/or site visit since **tours at other times might not be available.**

While attendance is not mandatory, it will be the sole responsibility of the bidder to inspect the City's location (s)/facilities OR /and become familiar with the scope of the City's requirements and systems prior to submitting a proposal. No variation in price or conditions shall be permitted based upon a claim of ignorance. It is strongly suggested that all Contractors attend the pre-bid meeting and/or site visit.

Bidding blanks may be obtained free of charge at BIDSYNC.COM. Drawing Plans are on file in the Public Works Department, City of Fort Lauderdale at 100 North Andrews Avenue, 4<sup>th</sup> floor, (Monday thru Friday 8:00 am to 4:30 pm) at a **NON-REFUNDABLE** cost of \$25.00 (including sales tax per set). Only cash or cashier's check made payable to the City of Fort Lauderdale are accepted.

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Added on Mar 20, 2019:

Addendum

1-New Document Added:

Plan Specification Request Form: Proposers' must fill out and return form to gain access to solicitation plans.

2-New Dates:

a) Pre-Bid Meeting:

Old Date: Monday March 25th at 11:00 am.

New Date: Monday April 8th at 11:00 am

b) Questions and Answers – Bid Opening Will be extended:

Old Dates: Q & A April 11th – Bid Opening April 22nd.

New Dates: Q & A April 19th – Bid Opening May 2th.

Added on Mar 22, 2019:

Addendum

1-New Date:

Pre-Bid Meeting:

Old Date: Monday April 8<sup>th</sup> at 11:00am.

**New Date: Wednesday April 10<sup>th</sup> at 11:00am**

Added on May 2, 2019:

Addendum 3 has been added to the Documents page · It extends the bid due date. NOTE: The Q?A Duration has been extended as well.

Added on May 10, 2019:

Addendum 4)

1-New Date:

Bid Due Date

Old Date: May 14, 2:00 PM

**New Date: Tuesday, May 28<sup>th</sup> at 2:00 PM**

Added on May 17, 2019:

Addendum 5)

**1-New Date:**

**Bid Due Date**

**Old Date: Tuesday May 28th, 2:00 PM**

**New Date: Tuesday, June 4<sup>th</sup> at 2:00 PM**

**Addendum # 1**

Removed Documents 2018\_12\_14-PEELE-DIXIE-DRAWINGS.pdf

**Addendum # 2**

New Documents	ADDENDUM 1.pdf COFL Plan Specification Request Form Addendum 1.pdf		
Previous End Date	Apr 22, 2019 2:00:00 PM EDT	New End Date	May 2, 2019 2:00:00 PM EDT
Previous Q & A End Date	Apr 11, 2019 5:00:00 PM EDT	New Q & A End Date	Apr 19, 2019 5:00:00 PM EDT
Pre-Bid Conference Changes	Pre-Bid Conference information has changed. Please review all Pre-Bid Conferences.		

**Addendum # 3**

New Documents	ADDENDUM 2.pdf		
Pre-Bid Conference Changes	Pre-Bid Conference information has changed. Please review all Pre-Bid Conferences.		

**Addendum # 4**

New Documents	ADDENDUM 3.doc		
Previous End Date	May 2, 2019 2:00:00 PM EDT	New End Date	May 14, 2019 2:00:00 PM EDT
Previous Q & A End Date	Apr 19, 2019 5:00:00 PM EDT	New Q & A End Date	May 6, 2019 5:00:00 PM EDT

**Addendum # 5**

New Documents	Addendum 4.pdf		
Previous End Date	May 14, 2019 2:00:00 PM EDT	New End Date	May 28, 2019 2:00:00 PM EDT
Previous Q & A End Date	May 6, 2019 5:00:00 PM EDT	New Q & A End Date	May 16, 2019 5:00:00 PM EDT

**Addendum # 6**

New Documents	ADDENDUM 5.pdf		
Previous End Date	May 28, 2019 2:00:00 PM EDT	New End Date	Jun 4, 2019 2:00:00 PM EDT
Previous Q & A End Date	May 16, 2019 5:00:00 PM EDT	New Q & A End Date	May 23, 2019 5:00:00 PM EDT

**Item Response Form**

Item **12196-193--01-01 - Base Bid: Mobilization - Demobilization**  
 Lot Description Base Bid  
 Quantity **1 lump sum**  
 Unit Price   
 Delivery Location **City of Fort Lauderdale**  
[See ITB Specifications](#)  
[See ITB Specifications](#)  
 Fort Lauderdale FL 33301  
 Qty 1

**Description**  
 Mobilization, Transportation, Demobilization. THIS ITEM CANNOT EXCEED 5% OF THE BASE BID ITEM ONLY.

Item **12196-193--01-02 - Base Bid: Utility Relocation**  
 Lot Description Base Bid  
 Quantity **1 lump sum**  
 Unit Price   
 Delivery Location **City of Fort Lauderdale**  
[See ITB Specifications](#)  
[See ITB Specifications](#)  
 Fort Lauderdale FL 33301  
 Qty 1

**Description**  
 Furnish all labor, materials, and equipment to relocate existing lights, electrical conduits, supports, wiring, HVAC fan with louvers and hurricane shutters, controls and all related appurtenances in the tank room per the plans and specifications.

Item **12196-193--01-03 - Base Bid: Demolition**  
 Lot Description Base Bid  
 Quantity **1 lump sum**  
 Unit Price   
 Delivery Location **City of Fort Lauderdale**  
[See ITB Specifications](#)  
[See ITB Specifications](#)  
 Fort Lauderdale FL 33301  
 Qty 1

**Description**

Furnish all labor, materials, and equipment to demolish and remove the CMU wall, sodium hypochlorite tanks, piping, valves, and appurtenances per plans and specifications.

Item **12196-193--01-04 - Base Bid: Bifold Door**

Lot Description Base Bid

Quantity **1 lump sum**

Unit Price

Delivery Location **City of Fort Lauderdale**  
See ITB Specifications  
 See ITB Specifications  
 Fort Lauderdale FL 33301  
 Qty 1

**Description**

Furnish all labor, materials, and equipment to install the bifold door per the plans and specifications.

Item **12196-193--01-05 - Base Bid: Sodium Hypochlorite Tanks**

Lot Description Base Bid

Quantity **1 lump sum**

Unit Price

Delivery Location **City of Fort Lauderdale**  
See ITB Specifications  
 See ITB Specifications  
 Fort Lauderdale FL 33301  
 Qty 1

**Description**

Furnish all labor, materials, and equipment to install the sodium hypochlorite tanks, piping, valves, strainers, tank instruments, containment area coating, all appurtenances, testing and startup per the plans and specifications.

Item **12196-193--01-06 - Base Bid: Removal of Piping for the Existing Temporary Sodium Hypochlorite Storage and Fee**

Lot Description Base Bid

Quantity **1 lump sum**

Unit Price

Delivery Location **City of Fort Lauderdale**  
See ITB Specifications  
 See ITB Specifications  
 Fort Lauderdale FL 33301  
 Qty 1

**Description**

Remove and dispose of the piping for the existing temporary sodium hypochlorite system, including wall brackets and supports.

Item **12196-193--01-07 - Base Bid: Building Restoration**

Lot Description Base Bid

Quantity **1 lump sum**

Unit Price

Delivery Location **City of Fort Lauderdale**  
See ITB Specifications  
 See ITB Specifications  
 Fort Lauderdale FL 33301  
 Qty 1

**Description**

Restore the interior of the hypochlorite storage tank room and the exterior of south wall of the chemical building, including repair of damage resulting from the work, patching penetrations and holes resulting from removal of the temporary hypochlorite piping, checking the entire exterior surface of the south wall for areas of delaminated stucco, replacing areas of delaminated stucco and painting repaired areas of the interior and the entire exterior south wall of the chemical building.

Item **12196-193--01-08 - Base Bid: Removal and Replacement of Existing Degasifier Media and Vessel Cleaning**  
 Lot Description Base Bid  
 Quantity **1 lump sum**  
 Unit Price   
 Delivery Location **City of Fort Lauderdale**  
See ITB Specifications  
 See ITB Specifications  
 Fort Lauderdale FL 33301  
 Qty 1

**Description**

Furnish all labor, materials, and equipment to remove the existing media, clean the interior of each vessel with all appurtenances, and provide new media per the plans and specifications. Return degasifier vessels to full service.

Item **12196-193--01-09 - Base Bid: Degasifier Clean-In-Place System**  
 Lot Description Base Bid  
 Quantity **1 lump sum**  
 Unit Price   
 Delivery Location **City of Fort Lauderdale**  
See ITB Specifications  
 See ITB Specifications  
 Fort Lauderdale FL 33301  
 Qty 1

**Description**

Furnish all labor, materials, and equipment to provide a complete Degasifier Clean-in-Place system with all appurtenances per the plans and specifications.

Item **12196-193--01-10 - Base Bid: Cleaning System Drain**  
 Lot Description Base Bid  
 Quantity **1 lump sum**  
 Unit Price   
 Delivery Location **City of Fort Lauderdale**  
See ITB Specifications  
 See ITB Specifications  
 Fort Lauderdale FL 33301  
 Qty 1

**Description**

Furnish all labor, materials, and equipment to provide approximately 150 feet of a 4-inch drain from the Clean-in-Place system to the existing sample sink drain system with all appurtenances per the plans and specifications.

**Item** 12196-193--02-01 - Bid Alternate 1: Expedite Sodium Hypochlorite Tanks Lead Time and Fabrication

**Lot Description** Bid Alternate 1

**Quantity** 1 lump sum

**Unit Price**

**Delivery Location** City of Fort Lauderdale  
See ITB Specifications  
 See ITB Specifications  
 Fort Lauderdale FL 33301  
 Qty 1

**Description**

Expedite lead time by 1 to 2 weeks for specified approval drawings ARO and by 6 to 8 weeks for fabrication after specified City approval of full fabrication drawings.

**Item** 12196-193--03-01 - Bid Alternate 2: Extended 10-Yr. Sodium Hypochlorite Tanks Warranty

**Lot Description** Bid Alternate 2

**Quantity** 1 lump sum

**Unit Price**

**Delivery Location** City of Fort Lauderdale  
See ITB Specifications  
 See ITB Specifications  
 Fort Lauderdale FL 33301  
 Qty 1

**Description**

Provide an extended 10 year warranty for the chemical tanks supplemental to specified warranty.( Additional to the 5 years requested in the solicitation)

**Item** 12196-193--04-01 - Bid Alternate 3: Extended 20-Yr. Sodium Hypochlorite Tanks Warranty

**Lot Description** Bid Alternate 3

**Quantity** 1 lump sum

**Unit Price**

**Delivery Location** City of Fort Lauderdale  
See ITB Specifications  
 See ITB Specifications  
 Fort Lauderdale FL 33301  
 Qty 1

**Description**

Provide an extended 20 year warranty for the chemical tanks supplemental to specified warranty.( Additional to the 5 years requested in the solicitation)

**CITY OF FORT LAUDERDALE  
CONTRACT AND SPECIFICATIONS PACKAGE**

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**BID NO. 12196-193**

**PROJECT NO. 12295**

**Peele-Dixie Water Treatment Plant Chemical Tank  
Replacements and Degasifier Improvements**



**STEVE HILLBERG  
PROJECT MANAGER II**

**FAUSTO VARGAS  
PROCUREMENT SPECIALIST**  
Telephone: (954) 828-6167 E-mail: [fvargas@fortlauderdale.gov](mailto:fvargas@fortlauderdale.gov)

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**Note:** The following documents are available electronically for completion and documents must be returned with your bid along with your bid security, proof of insurance, and proof of required licenses/certifications.

- CITB Prime Contractor ID Form
- CITB Local Business Preference
- CITB Trench Safety
- CITB Non-Collusion Statement
- CITB Contract Payment Method
- CITB Construction Bid Certification
- Non-Discrimination Certification Form

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Information on bid results and projects currently out to bid can be obtained on the City's website – <http://www.fortlauderdale.gov/departments/finance/procurement-services>. For general inquiries, please call (954) 828-5933.

## **INSTRUCTIONS TO BIDDERS**

The following instructions are given for the purpose of guiding bidders in properly preparing their bids or proposals. These directions have equal force and weight with the specifications and strict compliance is required with all of these provisions.

**QUALIFICATIONS OF BIDDERS** – No proposal will be accepted from, nor will any contract be awarded to, any person who is in arrears to the CITY OF FORT LAUDERDALE, upon any debt or contract, or who has defaulted, as surety or otherwise, upon any obligation to the City, or who is deemed irresponsible or unreliable by the City Commission of Fort Lauderdale.

**PERSONAL INVESTIGATION** - Bidders shall satisfy themselves by personal investigation, and by such other means as they may think necessary or desirable, as to the conditions affecting the proposed work and the cost. No information derived from maps, plans, specifications, or from the Engineer, City Manager, or their assistants shall relieve the Contractor from any risk or from fulfilling all terms of the contract.

**INCONSISTENCIES** – Any seeming inconsistency between different provisions of the plans, specifications, proposal or contract, or any point requiring explanation must be inquired into by the bidder, in writing, at least ten (10) days prior to the time set for opening proposals. After proposals are opened, the bidders shall abide by the decision of the Engineer as to such interpretation.

**ADDENDA AND INTERPRETATIONS** - No interpretations of the meaning of the plans, specifications or other contract documents will be made orally to any bidder. Prospective bidders must request such interpretation in writing as instructed in the bid package. To be considered, such request must be received by the Questions and Answers deadline as indicated in BIDSYNC.COM. Material changes, if any, to the scope of services or bidding procedures will only be transmitted by written addendum. **It is the bidder's responsibility to verify if addendums have been issued in BIDSYNC.COM.** Failure of any bidder to receive any such addenda or interpretation shall not relieve any bidder from any obligation under his bid as submitted. All addenda so issued shall become a part of the contract document. **Bidder** shall verify **in BIDSYNC.COM** that he has all addenda before submitting a bid.

**LEGAL CONDITIONS** - Bidders are notified to familiarize themselves with the provisions of the laws of the State of Florida relating to hours of labor on municipal work, and with the provisions of the laws of the State of Florida and the Charter and the ordinances of the City of Fort Lauderdale.

**PUBLIC ENTITY CRIMES** - A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a Contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statutes, for CATEGORY TWO for a period of thirty-six (36) months from the date of being placed on the convicted vendor list.

**FORMS OF PROPOSALS** - Each proposal and its accompanying statements must be made on the blanks provided. **THE FORMS MUST BE SUBMITTED ELECTRONICALLY, IN GOOD ORDER WITH ALL BLANKS COMPLETED**, and must show the name of the bidder and a statement as to its contents.

**INSTRUCTIONS TO BIDDERS (continued)**

**FORMS OF PROPOSALS (CONTINUED)** - The proposal must be signed by one duly authorized to do so, and in case signed by a deputy or subordinate, the principal's properly written authority to such deputy or subordinate must accompany the proposal. No proposal will be accepted, for any reason whatsoever, which is not submitted to the City as stated above, within the specified time.

**INSURANCE** - Contractor shall provide and shall require all of its sub-contractors to provide, pay for, and maintain in force at all times during the term of the Agreement, such insurance, including Property Insurance (Builder's Risk), Commercial General Liability Insurance, Business Automobile Liability Insurance, Workers' Compensation Insurance, Employer's Liability Insurance, and Umbrella/Excess Liability, as stated below. Such policy or policies shall be issued by companies authorized to do business in the State of Florida and having agents upon whom service of process may be made in the State of Florida.

**BID BOND** - A certified check, cashier's check or bank officer's check, for the sum set forth in the advertisement, made payable to the City of Fort Lauderdale, Florida, or bid bond in such amount, shall accompany each proposal as evidence of the good faith and responsibility of the bidder. The check or bond shall be retained by the City as liquidated damages should the bidder refuse to or fail to enter into a contract for the execution of the work embraced in this proposal, in the event the proposal of the bidder is accepted. Retention of such amount shall not be construed as a penalty or forfeiture.

The above bond or check shall be a guarantee that the bidder will, if necessary, promptly execute a satisfactory contract and furnish good and sufficient bonds. As soon as a satisfactory contract has been executed and the bonds furnished and accepted, the check or bond accompanying the proposal of the successful bidder will be returned to him. The certified or other checks or bid bonds of the unsuccessful bidders will be returned to them upon the acceptance of the bid of the successful bidder. If the successful bidder shall not enter into, execute, and deliver such a contract and furnish the required bonds within ten (10) days after receiving notice to do so, the certified or other check or bid bond shall immediately become the property of the City of Fort Lauderdale as liquidated damages. Retention of such amount shall not be construed as a penalty or forfeiture.

**FILLING IN BIDS** - All prices must be electronically submitted in the proposal pages, and all proposals must fully cover all items for which proposals are asked and no other. Bidders are required to state the names and places of residence of all persons interested, and if no other person is interested, the bidder shall distinctly state such fact and shall state that the proposal is, in all respects, fair and without collusion or fraud. Where more than one person is interested, it is required that all persons interested or their legal representative make all verification and subscribe to the proposal.

**PRICES QUOTED:** Deduct any discount offered and quote firm net unit prices. In the case of a discrepancy in computing the amount of the bid, the unit price quoted will govern. All prices quoted shall be F.O.B. destination, freight prepaid (Bidder pays and bears freight charges, Bidder owns goods in transit and files any claims), unless otherwise stated in Special Conditions. Each item must be bid separately. No attempt shall be made to tie any item or items contained in the ITB with any other business with the City.

**BIDS FIRM FOR ACCEPTANCE:** Bidder warrants, by virtue of bidding, that his bid and the prices quoted in his bid will be firm for acceptance by the City for a period of one hundred and twenty (120) days from the date of bid opening unless otherwise stated in the ITB. The City shall award contract within this time period or shall request to the recommended awarded vendor an extension to hold pricing, until products/services have been awarded.

**ADDITIONAL ITEMS OR SERVICES:** The City may require additional items or services of a similar nature, but not specifically listed in the contract. The Contractor agrees to provide such items or

**INSTRUCTIONS TO BIDDERS (continued)**

services, and shall provide the City prices on such additional items or services. If the price(s) offered are not acceptable to the City, and the situation cannot be resolved to the satisfaction of the City, the City reserves the right to procure those items or services from other vendors, or to cancel the contract upon giving the Contractor thirty (30) days written notice.

**DELETION OR MODIFICATION OF SERVICES:** The City reserves the right to delete any portion of the Contract at any time without cause, and if such right is exercised by the City, the total fee shall be reduced in the same ratio as the estimated cost of the work deleted bears to the estimated cost of the work originally planned. If work has already been accomplished on the portion of the Contract to be deleted, the Contractor shall be paid for the deleted portion on the basis of the estimated percentage of completion of such portion.

If the Contractor and the City agree on modifications or revisions to the task elements, after the City has approved work to begin on a particular task or project, and a budget has been established for that task or project, the Contractor will submit a revised budget to the City for approval prior to proceeding with the work.

**CAUSES FOR REJECTION** - No proposal will be canvassed, considered or accepted which, in the opinion of the City Commission, is informal or unbalanced, or contains inadequate or unreasonable prices for any items; each item must carry its own proportion of the cost as nearly as is practicable. Any alteration, erasure, interlineation, or failure to specify bids for all items called for in the schedule shall render the proposal informal.

**REJECTION OF BIDS** - The City reserves the right to reject any bid if the evidence submitted by the bidder, or if the investigation of such bidder, fails to satisfy the City that such bidder is properly qualified to carry out the obligations and to complete the work contemplated. Any or all proposals will be rejected, if there is reason to believe that collusion exists among bidders. A proposal will be considered irregular and may be rejected, if it shows serious omissions, alterations in form, additions not called for, conditions or unauthorized alternates, or irregularities of any kind. The City reserves the right to reject any or all proposals and to waive such technical errors as may be deemed best for the interests of the City.

**BID PROTEST PROCEDURE:** Any proposer or bidder who is not recommended for award of a contract and who alleges a failure by the City to follow the City's procurement ordinance or any applicable law may protest to the Procurement Division – Procurement Manager, by delivering a letter of protest within five (5) days after a Notice of Intent to award is posted on the City's website at the following link: [http://www.fortlauderdale.gov/purchasing/notices\\_of\\_intent.htm](http://www.fortlauderdale.gov/purchasing/notices_of_intent.htm). The complete protest ordinance may be found on the City's website at the following link: <http://www.fortlauderdale.gov/purchasing/protestordinance.pdf>.

**WITHDRAWALS** - Any bidder may, without prejudice to himself, withdraw his proposal at any time prior to the expiration of the time during which proposals may be submitted. Such request for withdrawal must be in writing and signed in the same manner and by the same person who signed the proposal. After expiration of the period for receiving proposals, no proposal can be withdrawn, modified, or explained.

**CONTRACT** - The bidder to whom award is made shall execute a written contract to do the work and maintain the same in good repair until final acceptance by the proper authorities, and shall furnish

**INSTRUCTIONS TO BIDDERS (continued)**

good and sufficient bonds as specified within ten (10) days after receiving such contract for execution. If the bidder to whom the first award is made fails to enter into a contract as provided, the award may be annulled and the contract let to the next lowest bidder who is reliable, responsible, and responsive in the opinion of the City Commission, and that bidder shall fulfill every stipulation and obligation as if such bidder were the original party to whom award was made.

The contract shall provide that the Contractor agrees to correct any defective or faulty work or material, which may appear within one (1) year after completion of the work and receipt of final payment.

**ENFORCEMENT OF SPECIFICATIONS** - Copies of the specifications will be placed in the hands of all the assistants to the Engineer and Inspectors employed on the work, who shall enforce each and every requirement of the contract. Such assistants shall have no authority to vary from such requirements.

**COPIES OF DRAWING PLANS** - Copies of the drawing plans are on file in the Public Works Department, City Hall, 4<sup>th</sup> Floor, 100 N. Andrews Avenue, Fort Lauderdale, Florida 33301.

**SURETY BOND** – The Contractor shall execute and record in the public records of Broward County, Florida, a payment and performance bond in an amount at least equal to the Contract Price with a surety insurer authorized to do business in the State of Florida as surety, (“Bond”), in accordance with Section 255.05, Florida Statutes (2014), as may be amended or revised, as security for the faithful performance and payment of all of the Contractor’s obligations under the Contract Documents.

The successful bidder shall furnish a performance and payment bond in compliance with Section 255.05, Florida Statutes, written by a Corporate Surety company, holding a Certificate of Authority from the Secretary of the Treasury of the United States as acceptable sureties on federal bonds, in an amount equal to the total amount payable by the terms of the contract, executed and issued by a Resident Agent licensed by and having an office in the State of Florida, representing such Corporate Surety, conditioned for the due and faithful performance of the work, and providing in addition to all other conditions, that if the Contractor, or his or its subcontractors, fail to duly pay for any labor, materials, or other supplies used or consumed by such Contractor, or his or its subcontractor or subcontractors, in performance of the work contracted to be done, the Surety will pay the same in the amount not exceeding the sum provided in such bonds, together with interest at the rate of fifteen percent (15%) per annum, and that they shall indemnify and save harmless the City of Fort Lauderdale to the extent of any and all payments in connection with carrying out of the contract, which the City may be required to make under the law.

The Contractor is required at all times to have a valid surety bond in force covering the work being performed. A failure to have such bond in force at any time shall constitute a default on the part of the Contractor. A bond written by a surety, which becomes disqualified to do business in the State of Florida, shall automatically constitute a failure on the part of the Contractor to meet the above requirements.

Such bond shall continue in effect for one (1) year after completion and acceptance of the work with liability equal to at least twenty-five percent (25%) of contract price, or an additional bond shall be conditioned that the Contractor will correct any defective or faulty work or material which appear within one (1) year after completion of the contract, upon notification by the City, except in contracts which are concerned solely with demolition work, in which cases twenty-five percent (25%) liability will not be applicable.

## INSTRUCTIONS TO BIDDERS (continued)

AUDIT OF CONTRACTOR'S RECORDS - Upon execution of the Contract, the City reserves the right to conduct any necessary audit of the Contractor's records. Such an audit, or audits, may be conducted by the City or its representatives at any time prior to final payment, or thereafter, for a period up to three (3) years. The City may also require submittal of the records from either the Contractor, the Subcontractor, or both. For the purpose of this Section, records shall include all books of account, supporting documents and papers deemed necessary by the City to assure compliance with the contract provisions.

Failure of the Contractor or Subcontractor to comply with these requirements may result in disqualification or suspension from bidding for future contracts or disapproval as a Subcontractor at the option of the City.

The Contractor shall assure that each of its Subcontractors will provide access to its records pertaining to the project upon request by the City.

PERIODIC ESTIMATE FOR PARTIAL PAYMENT - After the Contractor has submitted a periodic estimate for partial payment, approved and certified by the Public Works Department, the City shall make payment in the manner provided in the Contract Documents and in accordance with Florida's Prompt Payment Act, Section 218, Florida Statutes.

RESERVATION FOR AWARD AND REJECTION OF BIDS - The City reserves the right to accept or reject any or all bids, part of bids, and to waive minor irregularities or variations to specifications contained in bids, and minor irregularities in the bidding process. The City also reserves the right to award the contract on a split order basis, lump sum basis, individual item basis, or such combination as shall best serve the interest of the City. The City reserves the right to make an award to the responsive and responsible bidder whose product or service meets the terms, conditions, and specifications of the ITB and whose bid is considered to best serve the City's interest. In determining the responsiveness of the offer and the responsibility of the Bidder, the following shall be considered when applicable: the ability, capacity and skill of the Bidder to perform as required; whether the Bidder can perform promptly, or within the time specified, without delay or interference; the character, integrity, reputation, judgment, experience and efficiency of the Bidder; the quality of past performance by the Bidder; the previous and existing compliance by the Bidder with related laws and ordinances; the sufficiency of the Bidder's financial resources; the availability, quality and adaptability of the Bidder's supplies or services to the required use; the ability of the Bidder to provide future maintenance, service or parts; the number and scope of conditions attached to the bid.

MINORITY AND WOMEN BUSINESS ENTERPRISE PARTICIPATION AND BUSINESS - It is the desire of the City of Fort Lauderdale to increase the participation of minority (MBE) and women-owned (WBE) businesses in its contracting and procurement programs. While the City does not have any preference or set aside programs in place, it is committed **to a policy of equitable participation for these firms**. The City of Fort Lauderdale wants to increase the participation of Minority Business Enterprises (MBE), Women Business Enterprises (WBE), and Small Business Enterprises (SBE) in its procurement activities. If your firm qualifies in accordance with the below definitions please indicate in the space provided in this ITB.

Minority Business Enterprise (MBE) "A Minority Business" is a business enterprise that is owned or controlled by one or more socially or economically disadvantaged persons. Such disadvantage may arise from cultural, racial, chronic economic circumstances or background or other similar cause. Such persons include, but are not limited to: Blacks, Hispanics, Asian Americans, and Native Americans.

The term "Minority Business Enterprise" means a business at least fifty-one percent (51%) of which is owned by minority group members or, in the case of a publicly owned business, at least fifty-one percent (51%) of the stock of which is owned by minority group members. For the purpose of the preceding sentence, minority group members are citizens of the United States who include, but are not limited to: Blacks, Hispanics, Asian Americans, and Native Americans.

Women Business Enterprise (WBE) a "Women Owned or Controlled Business" is a business enterprise at least fifty-one percent (51%) of which is owned by females or, in the case of a publicly owned business, at least fifty-one percent (51%) of the stock of which is owned by females.

Small Business Enterprise (SBE) "Small Business" means a corporation, partnership, sole proprietorship, or other legal entity formed for the purpose of making a profit, which is independently owned and operated, has either fewer than 100 employees or less than \$1,000,000 in annual gross receipts.

BLACK includes persons having origins in any of the Black racial groups of Africa.

WHITE includes persons whose origins are Anglo-Saxon and Europeans and persons of Indo-European decent including Pakistani and East Indian.

HISPANIC includes persons of Mexican, Puerto Rican, Cuban, Central and South American, or other Spanish culture or origin, regardless of race.

NATIVE AMERICAN includes persons whose origins are American Indians, Eskimos, Aleuts, or Native Hawaiians.

ASIAN AMERICAN includes persons having origin in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands.

DEBARRED OR SUSPENDED BIDDERS OR PROPOSERS - The bidder or proposer certifies, by submission of a response to this solicitation, that neither it nor its principals and subcontractors are presently debarred or suspended by any Federal department or agency.

LOBBYING ACTIVITIES - ALL CONTRACTORS PLEASE NOTE: Any contractor submitting a response to this solicitation must comply, if applicable, with City of Fort Lauderdale Ordinance No. C-00-27 & Resolution No. 07-101, Lobbying Activities. Copies of Ordinance No., C-00-27, and Resolution No. 07-101, may be obtained from the City Clerk's Office on the 7th Floor of City Hall, 100 N. Andrews Avenue, Fort Lauderdale, Florida. The ordinance may also be viewed on the City's website at [http://www.fortlauderdale.gov/clerk/LobbyistDocs/lobbyist\\_ordinance.pdf](http://www.fortlauderdale.gov/clerk/LobbyistDocs/lobbyist_ordinance.pdf)

EARLY PROJECT COMPLETION INCENTIVE

The City reserves the right to or not to negotiate an incentive program with the awarded vendor for timely completion. The City is under no obligation to offer such an incentive.

## PROJECT 12295

**SPECIAL CONDITIONS****01. PURPOSE**

The City of Fort Lauderdale, Florida (City) is seeking bids from qualified bidders, hereinafter referred to as the Contractor, to provide Construction Services, in accordance with the terms, conditions, and specifications contained in this Invitation To Bid (ITB).

**02. TRANSACTION FEES**

The City of Fort Lauderdale uses BidSync ([www.bidsync.com](http://www.bidsync.com)) to distribute and receive bids and proposals. There is no charge to vendors/contractors to register and participate in the solicitation process, nor will any fees be charged to the awarded contractor.

**03. SUBMISSION OF BIDS**

It is the sole responsibility of the Contractor to ensure that their bid is submitted electronically through BidSync at [www.bidsync.com](http://www.bidsync.com) and that any bid security not submitted via BidSync reaches the City of Fort Lauderdale City Hall, Procurement Services Division, 6<sup>th</sup> floor, Room 619, 100 N. Andrews Avenue, Fort Lauderdale, FL 33301 in a sealed envelope marked on the outside with the ITB solicitation number and Contractor's name, no later than the time and date specified in this solicitation. **PAPER BID SUBMITALS WILL NOT BE ACCEPTED. PLEASE SUBMIT YOUR BID RESPONSE ELECTRONICALLY.**

**04. INFORMATION OR CLARIFICATION**

For information concerning procedures for responding to this solicitation, contact **Fausto Vargas Procurement Specialist I**, at (954) 828-6167 or email at [fvargas@fortlauderdale.gov](mailto:fvargas@fortlauderdale.gov). Such contact shall be for clarification purposes only.

For information concerning technical specifications please utilize the question/answer feature provided by BidSync at [www.bidsync.com](http://www.bidsync.com). Questions of a material nature must be received prior to the cut-off date specified in the solicitation. Material changes, if any, to the scope of services or bidding procedures will only be transmitted by written addendum. (See addendum section of BidSync Site). **Contractors please note:** No part of your bid can be submitted via FAX. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a bid will be considered evidence that the Contractor has familiarized himself with the nature and extent of the work, and the equipment, materials, and labor required. The entire bid response must be

submitted in accordance with all specifications contained in this solicitation. The questions and answers submitted in BidSync shall become part of any contract that is created from this ITB.

## 05. CONTRACT PERIOD

- 5.1 The Contractor recognizes that TIME IS OF THE ESSENCE. The Work shall commence within **30** calendar days of the date of the Notice to Proceed.
- 5.2 The Work shall be Substantially Completed within **150** calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.
- 5.3 The Work shall be finally completed on the Final Completion Date and ready for final payment in accordance with this Agreement within **180** calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.

The City of Fort Lauderdale reserves the right to waive any informality in any bid and to reject any or all bids. The City of Fort Lauderdale reserves the right to reduce or delete any of the bid items.

**At time of award of contract, the City reserves the right to set a maximum dollar limit that may be expended on this project. Contract quantities of any or all items may be increased, reduced, or eliminated to adjust the contract amount to coincide with the amount of work necessary or to bring the contract value to within the established limit. All quantities are estimated and the City reserves the right to increase, reduce, or eliminate the contract quantities in any amount.**

**The undersigned bidder affirms that he has or will obtain all equipment necessary to complete the work described, that he has or will obtain all required permits and licenses from the appropriate agencies, and that his firm is authorized to do business in the State of Florida.**

## 06. BID SECURITY

A certified check, cashier's check, bank officer's check or bid bond for **FIVE** percent (**5%**) of the bid amount, made payable to the City of Fort Lauderdale, Florida, shall accompany each proposal.

## SPECIAL CONDITIONS (continued)

## PROJECT 12295

**07. REQUIRED LICENSES/CERTIFICATIONS**

Contractor certified by State of Florida to perform the work specified in the scope. Must possess State of Florida General Contractor's License.

**Note: Contractor must have proper licensing and be able to provide evidence of same, if requested, at time of award.**

**08. SPECIFIC EXPERIENCE REQUIRED**

Contractor and Subcontractors shall each have a minimum of 5-years' experience constructing or repairing concrete block walls, relocation of exhaust fans and associated conduits, installation of fiberglass chemical storage tanks, removal and replacement of degasifier media, cleaning degasifier interiors and installation of degasifier cleaning systems. The contractor must submit a minimum of three (3) specific municipal project references for similar projects which have been completed in the last 5 years. Successful completion of the projects is required as well as good references for consideration of performing this project. In addition, the referenced employees as submitted by the contractor are required to be on site through the project construction.

**REFERENCES SHOULD NOT INCLUDE CITY OF FORT LAUDERDALE EMPLOYEES OR WORK PERFORMED FOR THE CITY.**

**By signing this bid solicitation, contractor is affirming that this expertise will be provided for this contract at no additional charge.**

**09. BID ALLOWANCE**

**Allowance for permits:** Payments will be made to the contractor based on the actual cost of permits upon submission of paid permit receipts. The City shall not pay for other costs related to obtaining or securing permits.

The amount indicated is intended to be sufficient to cover the entire project. If the City Permit fees exceed the allowance indicated, the City will reimburse the contractor the actual amount of City Permit Fees required for project completion.

<b>Allowance</b>	<b>\$</b>
Unforeseen Reparis	50,000.00
Permitting Allowance	5,000.00
Total	55,000.00

**Note: The City will add this allowance to your bid.**

## SPECIAL CONDITIONS (continued)

## PROJECT 12295

**10. INSURANCE REQUIREMENTS** (See Article 10, Bonds and Insurance, of the Contract for details)Insurance

- 10.1 As a condition precedent to the effectiveness of this Agreement, during the term of this Agreement and during any renewal or extension term of this Agreement, the Contractor, at the Contractor's sole expense, shall provide insurance of such types and with such terms and limits as noted below. Providing proof of and maintaining adequate insurance coverage are material obligations of the Contractor. The Contractor shall provide the City a certificate of insurance evidencing such coverage. The Contractor's insurance coverage shall be primary insurance for all applicable policies. The limits of coverage under each policy maintained by the Contractor shall not be interpreted as limiting the Contractor's liability and obligations under this Agreement. All insurance policies shall be from insurers authorized to write insurance policies in the State of Florida and that possess an A.M. Best rating of A-, VII or better. All insurance policies are subject to approval by the City's Risk Manager.

The coverages, limits, and endorsements required herein protect the interests of the City, and these coverages, limits, and endorsements may not be relied upon by the Contractor for assessing the extent or determining appropriate types and limits of coverage to protect the Contractor against any loss exposure, whether as a result of this Agreement or otherwise. The requirements contained herein, as well as the City's review or acknowledgement, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Contractor under this Agreement.

The following insurance policies and coverages are required:

10.1.1 Commercial General Liability

Coverage must be afforded under a Commercial General Liability policy with limits not less than:

- \$1,000,000 each occurrence and \$2,000,000 aggregate for Bodily Injury, Property Damage, and Personal and Advertising Injury
- \$1,000,000 each occurrence and \$2,000,000 aggregate for Products and Completed Operations

Policy must include coverage for Contractual Liability and Independent Contractors.

The City and the City's officers, employees, and volunteers are to be covered as additional insureds with a CG 20 26 04 13 Additional Insured – Designated Person or Organization Endorsement or similar endorsement providing equal or broader Additional Insured Coverage with respect to liability arising out of activities performed by or on behalf of the Contractor. The coverage shall contain no special limitation on the scope of protection afforded to the City or the City's officers, employees, and volunteers.

#### 10.1.2 Business Automobile Liability

Coverage must be afforded for all Owned, Hired, Scheduled, and Non-Owned vehicles for Bodily Injury and Property Damage in an amount not less than \$1,000,000 combined single limit each accident.

If the Contractor does not own vehicles, the Contractor shall maintain coverage for Hired and Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

#### 10.1.3 Workers' Compensation and Employer's Liability

Coverage must be afforded per Chapter 440, Florida Statutes. Any person or entity performing work for or on behalf of the City must provide Workers' Compensation insurance. Exceptions and exemptions will be allowed by the City's Risk Manager, if they are in accordance with Florida Statute.

The Contractor waives, and the Contractor shall ensure that the Contractor's insurance carrier waives, all subrogation rights against the City and the City's officers, employees, and volunteers for all losses or damages. The City requires the policy to be endorsed with WC 00 03 13 Waiver of our Right to Recover from Others or equivalent.

The Contractor must be in compliance with all applicable State and federal workers' compensation laws, including the U.S. Longshore Harbor Workers' Act and the Jones Act, if applicable.

#### Insurance Certificate Requirements

- a. The Contractor shall provide the City with valid Certificates of Insurance (binders are unacceptable) no later than thirty (30) days prior to the start of work contemplated in this Agreement.

## SPECIAL CONDITIONS (continued)

## PROJECT 12295

- b. The Contractor shall provide the City with valid Certificates of Insurance (binders are unacceptable) no later than thirty (30) days prior to the start of work contemplated in this Agreement.
- c. The Contractor shall provide to the City a Certificate of Insurance having a thirty (30) day notice of cancellation; ten (10) days' notice if cancellation is for nonpayment of premium.
- d. In the event that the insurer is unable to accommodate the cancellation notice requirement, it shall be the responsibility of the Contractor to provide the proper notice. Such notification will be in writing by registered mail, return receipt requested, and addressed to the certificate holder.
- e. In the event the Agreement term goes beyond the expiration date of the insurance policy, the Contractor shall provide the City with an updated Certificate of Insurance no later than ten (10) days prior to the expiration of the insurance currently in effect. The City reserves the right to suspend the Agreement until this requirement is met.
- f. The Certificate of Insurance shall indicate whether coverage is provided under a claims-made or occurrence form. If any coverage is provided on a claims-made form, the Certificate of Insurance must show a retroactive date, which shall be the effective date of the initial contract or prior.
- g. The City shall be named as an Additional Insured on all liability policies, with the exception of Workers' Compensation.
- h. The City shall be granted a Waiver of Subrogation on the Contractor's Workers' Compensation insurance policy.
- i. The title of the Agreement, Bid/Contract number, event dates, or other identifying reference must be listed on the Certificate of Insurance.

The Certificate Holder should read as follows:

City of Fort Lauderdale

100 N. Andrews Avenue

Fort Lauderdale, FL 33301

The Contractor has the sole responsibility for the payment of all insurance premiums and shall be fully and solely responsible for any costs or expenses as a result of a coverage deductible, co-insurance penalty, or self-insured retention; including any loss not covered because of the operation of such deductible, co-insurance penalty, self-insured retention, or coverage exclusion or limitation. Any costs for adding the City as an Additional Insured shall be at the Contractor's expense.

If the Contractor's primary insurance policy/policies do not meet the minimum requirements, as set forth in this Agreement, the Contractor may provide evidence of an Umbrella/Excess insurance policy to comply with this requirement.

The Contractor's insurance coverage shall be primary insurance as applied to the City and the City's officers, employees, and volunteers. Any insurance or self-insurance maintained by the City covering the City, the City's officers, employees, or volunteers shall be non-contributory.

Any exclusion or provision in the insurance maintained by the Contractor that excludes coverage for work contemplated in this Agreement shall be unacceptable and shall be considered breach of contract.

All required insurance policies must be maintained until the contract work has been accepted by the City, or until this Agreement is terminated, whichever is later. Any lapse in coverage shall be considered breach of contract. In addition, Contractor must provide to the City confirmation of coverage renewal via an updated certificate should any policies expire prior to the expiration of this Agreement. The City reserves the right to review, at any time, coverage forms and limits of Contractor's insurance policies.

The Contractor shall provide notice of any and all claims, accidents, and any other occurrences associated with this Agreement shall be provided to the Contractor's insurance company or companies and the City's Risk Management office as soon as practical.

It is the Contractor's responsibility to ensure that any and all of the Contractor's independent contractors and subcontractors comply with these insurance requirements. All coverages for independent contractors and subcontractors shall be subject to all of the applicable requirements stated herein. Any and all deficiencies are the responsibility of the Contractor.

#### 10.1.4 ADDITIONAL REQUIRED COVERAGES (for specialty contracts as determined by Risk Management)

##### 10.1.4.1 Disposal Coverage

The Contractor shall designate the disposal site and furnish a Certificate of Insurance from the disposal facility for Environmental Impairment Liability Insurance, covering liability for sudden and accidental occurrences in an amount not less than \$1,000,000 per claim and shall include liability for non-sudden occurrences in an amount not less than \$1,000,000 per claim.

##### 10.1.4.2 Umbrella/Excess Liability:

The Contractor shall provide umbrella/excess coverage with limits of no less than \$2,000,000 excess of Commercial General Liability, Automobile Liability and Employer's Liability.

**NOTE: CITY PROJECT NUMBER AND NAME MUST APPEAR ON EACH CERTIFICATE, AND THE CITY OF FORT LAUDERDALE MUST BE NAMED ON THE CERTIFICATE AS AN “ADDITIONAL INSURED” ON ALL LIABILITY POLICIES, WITH THE EXCEPTION OF WORKERS’ COMPENSATION.**

**A Sample Insurance Certificate shall be included with the proposal to demonstrate the firm’s ability to comply with insurance requirements. Provide a previous certificate or other evidence listing the insurance companies’ names for all required coverage, and the dollar amounts of the coverage.**

**11. PERFORMANCE AND PAYMENT BOND: 100%**

**Number of awards anticipated: One (1)**

**12. CITY PROJECT MANAGER**

The Project Manager is hereby designated by the City as Steve Hillberg whose address is 100 North Andrews, 5<sup>th</sup> Floor, Fort Lauderdale, FL 33301, telephone number: (954) 828-5076, and email address is [shillberg@fortlauderdale.gov](mailto:shillberg@fortlauderdale.gov). The Project Manager will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the Contract Documents in connection with completion of the Work in accordance with this Agreement.

**13. LIQUIDATED DAMAGES** *(See Article 16, Liquidated Damages, of the Contract for details)*

Upon failure of the Contractor to complete the Work within the time specified for completion, the Contractor shall pay to the City the sum of **Five Hundred Dollars (\$500.00)** for each and every calendar day that the completion of the Work is delayed beyond the time specified in this Agreement for completion, as fixed and agreed liquidated damages and not as a penalty, so long as the delay is caused by the Contractor. (See Article 16, Liquidated Damages Clause, of the Contract)

**14. PAYMENT** (*See Article 7, Payment, of the Contract for other details*)

The City has implemented a Purchasing Card (P-Card) Program utilizing both VISA and MASTERCARD networks. Purchases from this contract will be made utilizing the City's

Purchasing Card. Contractor will receive payment from the purchasing card in the same manner as other credit card purchases. Accordingly, bidders must presently have the ability to

accept these credit cards or take whatever steps necessary to implement the ability before the start of the contract term, or contract award by the City. The City reserves the right to revise this program as necessary.

**15. WORK SCHEDULE (including overtime hours): Standard**

Regular work hours: **8:00 am to 4:30 pm, Monday through Friday.**

City Inspector Hours: **7:00 am to 4:30 pm, Monday through Friday.**

Any inspection requested by the contractor outside those hours will be considered overtime to be paid by the Contractor.

**16. INSPECTION OVERTIME COST: \$ 219.00 per Hour.**

**CITY OF FORT LAUDERDALE  
CONSTRUCTION AGREEMENT**

THIS AGREEMENT made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between the City of Fort Lauderdale, a Florida municipal corporation (City) and \_\_\_\_\_, (Contractor), (parties);

WHEREAS, the City desires to retain a contractor for the Project as expressed in its Invitation to Bid No., **12196-193** , Project Number, \_\_\_\_\_, which was opened on \_\_\_\_\_; and,

WHEREAS, the Contractor has expressed its willingness and capability to perform the necessary work to accomplish the Project.

NOW, THEREFORE, the City and the Contractor, in consideration of the mutual covenants and conditions contained herein and for other good and valuable consideration, the receipt and sufficiency is hereby acknowledged, agree as follows:

**ARTICLE 1 – DEFINITIONS**

Whenever used in this Agreement or in other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural forms:

- 1.1 Agreement – This written Agreement between the City and the Contractor covering the work to be performed including other Contract Documents that are attached to or incorporated in the Agreement.
- 1.2 Application for Payment – The form accepted by the City which is to be used by the Contractor in requesting progress or final payment and which is to include such supporting documentation as is required by the Contract Documents
- 1.3 Approve – The word approve is defined to mean review of the material, equipment or methods for general compliance with design concepts and with the information given in the Contract Documents. It does not imply a responsibility on the part of the City to verify in every detail conformance with plans and specifications.
- 1.4 Bid – The offer or Bid of the Contractor submitted on the prescribed form setting forth the total prices for the Work to be performed.
- 1.5 Bid Documents – This Agreement, advertisement for Invitation to Bids, the Instructions to Bidders, the Bid Form (with supplemental affidavits and agreements), the Contract Forms, General Conditions, the Supplementary Conditions, the Specifications, and the Plans, which documents all become an integral part of the Contract Documents.
- 1.6 Certificate of Substantial Completion - Certificate provided by the City certifying that all Work, excluding the punch list items, has been completed, inspected, and accepted by the \_\_\_\_\_ City.

- 1.7 Change Order - A change order is defined as a written order to a contractor approved by the City, authorizing a revision of an underlying agreement between the City and a contractor that is directly related to the original scope of work or an adjustment in the original contract price or the contract time directly related to the original scope of work, issued on or after the effective date of the contract.
- 1.8 City – The City of Fort Lauderdale, Florida, including but not limited to its employees, agents, officials, representatives, contractors, subcontractors, volunteers, successors and assigns, with whom the Contractor has entered into the Agreement and for whom the Work is to be provided.
- 1.9 Contract Documents – The Contract Documents shall consist of this Agreement, Exhibits to this Agreement, Public Construction Bond, Performance Bond, Payment Bond and Certificates of Insurance, Notice of Award and Notice to Proceed, General Conditions as amended by the Special Conditions, Technical Specifications, Plans/Drawings, Addenda, Bid Form and supplement Affidavits and Agreements, all applicable provisions of State and Federal Law and any modification, including Change Orders or written amendments duly delivered after execution of Agreement, Invitation to Bid, Instructions to Bidders and Bid Bond, Contractor's response to the City's Invitation to Bid, Schedule of Completion, Schedule of Values, all amendments, modifications and supplements, change orders and work directive changes issued on or after the Effective Date of the Agreement, as well as any additional documents that are required to be submitted under the Agreement.
- Permits on file with the City and or those permits to be obtained shall be considered directive in nature and will be considered a part of this Agreement. A copy of all permits shall be given to the City for inclusion in the Contract Documents. Terms of permits shall be met prior to acceptance of the Work and release of the final payment.
- 1.10 Contract Price – The monies payable to the Contractor by the City under the Contract Documents and in accordance with the line item unit prices listed in the Bid.
- 1.11 Contract Time - The number of calendar days stated in the Agreement for the completion of the Work. The dates on which the work shall be started and shall be completed as stated in the Notice to Proceed.
- 1.12 Contractor – The person, firm, company, or corporation with whom the City has entered into the Agreement, including but not limited to its employees, agents, representatives, contractors, subcontractors, their subcontractors and their other successors and assigns.
- 1.13 Day – A calendar day of twenty-four (24) hours ending at midnight.
- 1.14 Defective – An adjective which when modifying the word "Work" refers to work that is unsatisfactory, faulty, or deficient, or does not conform to the Contract Documents or does not meet the requirements of any inspection, test or approval referred to in the Contract Documents, or has been damaged prior to the Project Manager's recommendation of final payment.

- 1.15 Effective Date of the Agreement – The effective date of the agreement shall be the date the City Commission approves the work. The contractor shall provide all required payment and performance bonds and insurances to the City within ten (10) Calendar days following the City Commission approval. Upon verification of all bonds and insurances, the City will issue a notice to proceed (NTP) to the Contractor. Contract time will commence on the date when the Notice to Proceed is issued. The Contractor shall commence the work immediately upon receipt of the Notice to Proceed. Failure of the contractor to proceed with the work will constitute non-performance of the Contractor and would be ground for termination of the contract per ARTICLE 17 of the Agreement.
- 1.16 Final Completion Date – The date the Work is completed, including completion of the final punch list, and delivered along with those items specified in the Contract Documents and is accepted by the City.
- 1.17 Hazardous Materials (HAZMAT) - Any solid, liquid, or gaseous material that is toxic, flammable, radioactive, corrosive, chemically reactive, or unstable upon prolonged storage in quantities that could pose a threat to life, property, or the environment defined in Section 101(14) of Comprehensive Environmental Response, Compensation and Liability Act of 1980 and in 40 CFR 300.6. Also defined by 49 CFR 171.8 as a substance or material designated by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce and which has been so designated.
- 1.18 Hazardous Substance - As defined by Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act; any substance designated pursuant to Section 311(b) (2) (A) of the Clean Water Act; any element, compound, mixture, solution or substance designated pursuant to Section 102 identified under or listed pursuant to Section 3001 of the Solid Waste Disposal Act {but not including any waste listed under Section 307[a] of the Clean Water Act}; any hazardous air pollutant listed under Section 112 of the Clean Air Act; and any imminently hazardous chemical substance or mixture pursuant to Section 7 of the Toxic Substances Control Act. The term does not include petroleum, including crude oil or any fraction thereof, which is not otherwise specifically listed or designated as a hazardous substance in the first sentence of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).
- 1.19 Hazardous Waste - Those solid wastes designated by OSHA in accordance with 40 CFR 261 due to the properties of ignitability, corrosivity, reactivity, or toxicity. Any material that is subject to the Hazardous Waste Manifest requirements of the EPA specified in 40 CFR Part 262.
- 1.20 Holidays - Those designated non-work days as established by the City Commission of the City of Fort Lauderdale.
- 1.21 Inspection – The term “inspection” and the act of inspecting as used in this Agreement is defined to mean the examination of construction to ensure that it conforms to the design concept expressed in the plans and specifications. This term shall not be construed to mean supervision, superintending and/or overseeing.

- 1.22 Notice of Award - The written notice by City to the Contractor stating that upon compliance by the Contractor with the conditions precedent enumerated therein, within the time specified that the City will sign and deliver this Agreement.
- 1.23 Notice to Proceed – A written notice given by the City to the Contractor fixing the date on which the Contract Time will commence to run and on which the Contract Time will end.
- 1.24 Plans - The drawings which show the character and scope of the work to be performed and which have been prepared or approved by the City and are referred to in the Contract Documents.
- 1.25 Premises (otherwise known as Site or Work Site) – means the land, buildings, facilities, etc. upon which the Work is to be performed.
- 1.26 Project – The total construction of the Work to be provided as defined in the Contract Documents.
- 1.27 Project Manager - The employee of the City, or other designated individual who is herein referred to as the Project Manager, will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the contract Documents in connection with completion of the Work in accordance with this Agreement. The Project Manager, or designee, shall be the authorized agent for the City unless otherwise specified.
- 1.28 Punch List - The City's list of Work yet to be done or be corrected by the Contractor, before the Final Completion date can be determined by the City.
- 1.29 Record Documents - A complete set of all specifications, drawings, addenda, modifications, shop drawings, submittals and samples annotated to show all changes made during the construction process.
- 1.30 Record Drawings or "As-Builts" - A set of drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor. These documents will be signed and sealed by the Engineer of Record or a Professional Land Surveyor licensed in the State of Florida.
- 1.31 Substantially Completed Date – A date when the Contractor has requested in writing, stating that the Work is substantially completed and is ready for an inspection and issuance of a final punch list for the Project.
- 1.32 Work – The entire completed delivered product or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating material and equipment into the product, all as required by the Contract Documents.

## ARTICLE 2 – SCOPE OF WORK

- 2.1 The Contractor shall complete all work as specified or indicated in the Contract Documents. The Project for which the Work under the Contract Documents may be the whole or only part is generally described as follows:

### **Peele-Dixie Water Treatment Plant Chemical Tank Replacements and Degasifier Improvements**

ITB #12196-193 PROJECT # 12295

- 2.2 All Work for the Project shall be constructed in accordance with the Drawings and Specifications. The Work generally involves:

#### PROJECT DESCRIPTION

This project is located at 1500 South State Road 7, in the City of Fort Lauderdale. The work to be accomplished under this contract includes: the furnishing of all labor, equipment, and materials for removal and replacement of three, 11,500 gallon and one 950 gallon fiberglass sodium hypochlorite storage tanks and removal, disposal and replacement of degasifier media and installation of a degasifier media cleaning system. This project includes procurement, construction, testing, and placing in service, the equipment and materials shown on the Drawings and/or described in the Specifications. All materials, components and chemicals in contact with water in the treatment process must be NSF approved or Food Grade. In general terms, this project includes the following project elements covered by these Contract Documents:

1. Relocate an exhaust fan, interior lights, conduits, wiring and supports out of the way of the work,
2. Remove and dispose of existing removable concrete block wall panel measuring approximately 14 feet by 14 feet,
3. Install a bifold door across the wall panel opening,
4. Remove and dispose of existing chemical bulk storage and day tanks, including piping to the transfer pumps,
5. Remove and replace the coating in the containment area for the sodium hypochlorite tanks,
6. Install new chemical bulk storage and day tanks with all piping, connect to the transfer pumps, and provide startup services,
7. Remove and dispose of the piping for the City's existing temporary sodium hypochlorite system, including wall brackets and supports,
8. Restore the south wall of the chemical building, including repair of damage resulting from the work, patching penetrations and holes resulting from removal of the temporary hypochlorite piping, checking the entire surface of the south wall for areas of delaminated stucco, replacing areas of delaminated stucco and painting the entire exterior south wall of the chemical building,
9. Remove and replace degasifier media from two degasifiers, keeping one degasifier in service,

10. Clean the interior of each degasifier and test and restart each degasifier keeping one degasifier and
11. Install a degasifier media cleaning system to serve both degasifiers, keeping one degasifier in service and test and start up the degasifier media cleaning system.

2.3 Within ten (10) days of the execution of this Agreement, the Contractor shall submit a Construction Schedule, Schedule of Values and a listing of those subcontractors that will be utilized by the Contractor. The general sequence of the work shall be submitted by the Contractor and approved by the City before any work commences. The City reserves the right to issue construction directives necessary to facilitate the Work or to minimize any conflict with operations.

### **ARTICLE 3 – PROJECT MANAGER**

3.1 The Project Manager is hereby designated by the City as Steve Hillberg, whose address is 100 N. Andrews Avenue, 4<sup>th</sup> Floor, Fort Lauderdale, FL 33301, telephone number: (954) 828-5076, and email address is [shillberg@fortlauderdale.gov](mailto:shillberg@fortlauderdale.gov). The Project Manager will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the Contract Documents in connection with completion of the Work in accordance with this Agreement.

### **ARTICLE 4 – CONTRACT DOCUMENTS**

The Contract Documents which comprise the entire Agreement between the City and Contractor are attached to this Agreement, are made a part hereof and consist of the following:

- 4.1 This Agreement.
- 4.2 The Contract Documents may only be altered, amended, or repealed in accordance with the specific provisions of the terms of this Agreement.
- 4.3 Exhibits to this Agreement: (Plans sheets [ ] to [ ] inclusive).
- 4.4 Public Construction Bond, Performance Bond, Payment Bond and Certificates of Insurance.
- 4.5 Notice of Award and Notice to Proceed.
- 4.6 General Conditions as amended by the Special Conditions.
- 4.7 Technical Specifications.
- 4.8 Plans/Drawings.
- 4.9 Addenda number \_\_\_\_\_ through \_\_\_\_\_, inclusive.

- 4.10 Bid Form and supplement Affidavits and Agreements.
- 4.11 All applicable provisions of State and Federal Law.
- 4.12 Invitation to Bid No., **12196-193**, Instructions to Bidders, and Bid Bond.
- 4.13 Contractor's response to the City's Invitation to Bid No., **12196-193**, dated \_\_\_\_\_.
- 4.14 Schedule of Completion and Schedule of Values.
- 4.15 All amendments, modifications and supplements, change orders and work directive changes issued on or after the Effective Date of the Agreement.
- 4.16 Any additional documents that are required to be submitted under the Agreement.
- 4.17 Permits on file with the City and or those permits to be obtained shall be considered directive in nature and will be considered a part of this Agreement. A copy of all permits shall be given to the City for inclusion in the Contract Documents. Terms of permits shall be met prior to acceptance of the Work and release of the final payment.

In the event of any conflict between the documents or any ambiguity or missing specification or instruction, the following priority is established:

- a. Specific direction from the City Manager (or designee).
- b. Approved change orders, addenda or amendments.
- c. Specifications (quality) and Drawings (location and quantity).
- d. Supplemental conditions or special terms.
- e. General Terms and Conditions.
- f. This Agreement dated \_\_\_\_\_ and any attachments.
- g. Invitation to Bid No., **12196-193**, and the specifications prepared by the City.
- h. Contractor's response to the City's Invitation to Bid No., **12196-193**, dated \_\_\_\_\_.
- i. Schedule of Values.
- j. Schedule of Completion.

If during the performance of the Work, Contractor finds a conflict, error or discrepancy in the Contract Documents, Contractor shall so report to the Project Manager, in writing, at once

and before proceeding with the Work affected shall obtain a written interpretation or clarification from the City.

It is the intent of the specifications and plans to describe a complete Project to be constructed in accordance with the Contract Documents. Any Work that may reasonably be inferred from the specifications or plans as being required to produce the intended result shall be supplied whether or not it is specifically called for. When words which have a well-known technical or trade meaning are used to describe Work, materials, or equipment, such works shall be interpreted in accordance with such meaning. Reference to standard specifications, manuals or codes of any technical society, organization or associations, or to the code of any governmental authority whether such reference be specific or implied, shall mean the latest standard specification, manual or code in effect as of the Effective Date of this Agreement, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall change the duties and responsibilities of the City, the Contractor, or any of their agents or employees from those set forth in the Contract Documents.

#### **ARTICLE 5 – CONTRACT TIME**

- 5.1 The Contractor recognizes that **TIME IS OF THE ESSENCE**. The Work shall commence within **30** calendar days of the date of the Notice to Proceed.
- 5.2 The Work shall be Substantially Completed within **150** calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.
- 5.3 The Work shall be finally completed on the Final Completion Date and ready for final payment in accordance with this Agreement within **180** calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.

#### **ARTICLE 6 – CONTRACT PRICE**

- 6.1 City shall pay Contractor for performance of the Work in accordance with Article 7, subject to additions and deletions by Change Order, as provided for in this Agreement.
- 6.2 The parties expressly agree that the Contract Price, which shall not exceed the amount of \$\_\_\_\_\_, constitutes the total maximum compensation payable to Contractor for performing the Work, plus any Work done pursuant to a Change Order. The Contract Price is in accordance with the line item unit prices listed in the Bid. Line items are based on a unit price cost multiplied by a defined quantity. Any additional duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at Contractor's expense without change to the Contract Price.
- 6.3 The Contract Price constitutes the compensation payable to Contractor for performing the Work plus any Work done pursuant to a Change Order. All duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at Contractor's expense without change in the Contract price.

## ARTICLE 7 – PAYMENT

- 7.1 Contractor shall submit Applications for Payment in accordance with the Contract Documents. Applications for Payment will be processed by City as provided in the General Conditions.
- 7.2 Progress Payments. City shall make progress payments on account of the Contract Price on the basis of Contractor's monthly Applications for Payment, which shall be submitted by the Contractor between the first (1<sup>st</sup>) and the tenth (10<sup>th</sup>) day after the end of each calendar month for which payment is requested. All progress payments will be made on the basis of the progress of the Work completed.
- 7.3 Prior to Final Completion, progress payments will be made in an amount equal to ninety percent (90%) of the value of Work completed less in each case the aggregate of payments previously made.
- 7.4 Final Payment. Upon final completion of the Work in accordance with the General Conditions, as may be supplemented, the City shall pay Contractor an amount sufficient to increase total payments to one-hundred percent (100%) of the Contract Price. However, not less than ten percent (10%) of the Contract Price shall be retained until Record Drawings (as-builts), specifications, addenda, modifications and shop drawings, including all manufacturers' instructional and parts manuals are delivered to and accepted by the City.
- 7.5 City may withhold, in whole or in part, payment to such extent as may be necessary to protect itself from loss on account of:
- 7.5.1 Defective work not remedied.
  - 7.5.2 Claims filed or reasonable evidence indicating probable filing of claims by other parties against Contractor or City because of Contractor's performance.
  - 7.5.3 Failure of Contractor to make payments properly to Subcontractors or for material or labor.
  - 7.5.4 Damage to another contractor not remedied.
  - 7.5.5 Liquidated damages and costs incurred by Consultant for extended construction administration, if applicable.
  - 7.5.6 Failure of Contractor to provide any and all documents required by the Contract Documents.

When the above grounds are removed or resolved satisfactory to the Project Manager, payment shall be made in whole or in part.

- 7.6 The City shall make payment to the Contractor in accordance with the Florida Prompt Payment Act, Section 218.70, Florida Statutes.
- 7.7 The City shall make payment to the Contractor through utilization of the City's P-Card Program. The City has implemented a Purchasing Card Program utilizing both VISA and MASTERCARD networks. Purchases made from this Contract shall be made using the City's Purchasing Card. Contractor will receive payment from the

purchasing card in the same manner as other credit card purchases. Accordingly, bidders must presently have the ability to accept these credit cards or take whatever steps necessary to implement the ability before the start of the contract term, or contract award by the City. The City reserves the right to revise this program as necessary.

## **ARTICLE 8 – CONTRACTOR’S REPRESENTATIONS**

In order to induce the City to enter into this Agreement, Contractor makes the following representations upon which the City has relied:

- 8.1 Contractor is qualified in the field of public construction and in particular to perform the Work and services set forth in this Agreement.
- 8.2 Contractor has visited the Work Site, has conducted extensive tests, examinations and investigations and represents and warrants a thorough familiarization with the nature and extent of the Contract Documents, the Work, locality, soil conditions, moisture conditions and all year-round local weather and climate conditions (past and present), and, in reliance on such tests, examination and investigations conducted by Contractor and the Contractor's experts, has determined that no conditions exist that would in any manner affect the Proposed Price and that the project can be completed for the Proposed Price submitted within the Contract Time as defined in this Agreement. Furthermore, Contractor warrants and confirms that he is totally familiar with, understands and obligates Contractor to comply with all federal, state and local laws, ordinances, rules, regulations and all market conditions that affect or may affect the cost and price of materials and labor needed to fulfill all provisions of this Agreement or that in any manner may affect cost, progress or performance of the Work.
- 8.3 The Contractor has satisfied itself as to the nature and location of the Work under the Contract Documents, the general and local conditions of the Project, particularly those bearing upon availability of transportation, disposal, handling and storage of materials, availability of labor, water, electric power, and roads, the conformation and conditions at the ground based on City provided reports, the type of equipment and facilities needed preliminary to and during the prosecution of the Work and all other matters which can in any way affect the Work or the cost thereof under the Contract Documents.
- 8.4 The Contractor has also studied carefully all reports of investigations and tests of subsurface and latent physical conditions at the site or otherwise affecting cost, progress or performance of the Works, and finds and has further determined that no conditions exist that would in any manner affect the Proposed Price and that the project can be completed for the Proposed Price submitted.
- 8.5 Contractor has made or caused to be made examinations, investigations, tests and studies of such reports and related data in addition to those referred to in Paragraphs 8.2, 8.3 and 8.4 above as he deems necessary for the performance of the Work at the Contract Prices, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents; and no additional examinations, investigations, tests, reports or similar data are, or will be, required by Contractor for such purposes.

8.6 Contractor has correlated the results of all such observations, examinations, investigations, tests, reports and data with the terms and conditions of the Contract Documents.

8.7 Contractor has given City written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents and the written resolution by City is acceptable to the Contractor.

8.8 Labor

8.8.1 The Contractor shall provide competent, suitable qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. The Contractor shall at all times maintain good discipline and order at the site.

8.8.2 The Contractor shall, at all times, have a competent superintendent, capable of reading and thoroughly understanding the drawings and specifications, as the Contractor's agent on the Work, who shall, as the Contractor's agent, supervise, direct and otherwise conduct the Work.

8.8.3 The Contractor shall designate the superintendent on the job to the City, in writing, immediately after receipt of the Notice to Proceed. The Contractor understands and agrees that the superintendent's physical presence on the job site is indispensable to the successful completion of the Work. If the superintendent is frequently absent from the job site, the Project Manager may deliver written notice to the Contractor to stop work or terminate the Contract in accordance with Article 17.

8.8.4 The Contractor shall assign personnel to the job site that have successfully completed training programs related to trench safety, confined space and maintenance of traffic. A certified "competent person" shall be assigned to the job site. Personnel certified by the International Municipal Signal Associations with Florida Department of Transportation qualifications are required relative to maintenance of traffic. Failure to pursue the Work with the properly certified supervisory staff may result in notice to stop work or terminate the Contract in accordance with Article 17.

8.9 Materials:

8.9.1 The Contractor shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities and all other facilities and incidentals necessary for the execution, testing, initial operation and completion of Work.

8.9.2 All material and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. Suppliers shall be selected and paid by the Contractor; the City reserves the right to approve all suppliers and materials.

- 8.10 Work Hours: Except in connection with the safety or protection of persons, or the Work, or property at the site or adjacent thereto, and except as otherwise indicated in the Supplementary Conditions, all work at the site shall be performed during regular working hours between 8 a.m. and 4:30 p.m., Monday through Friday. The Contractor will not permit overtime work or the performance of work on Saturday, Sunday or any legal holiday (designated by the City of Fort Lauderdale) without the Project Manager's written consent at least seventy-two (72) hours in advance of starting such work. If the Project Manager permits overtime work, the Contractor shall pay for the additional charges to the City with respect to such overtime work. Such additional charges shall be a subsidiary obligation of the Contractor and no extra payment shall be made to the Contractor for overtime work. It shall be noted that the City's Inspector work hours are from 8:00 a.m. to 4:30 p.m. and any Work requiring inspection oversight being performed outside of this timeframe shall be paid for by the Contractor as Inspector overtime. The cost to the Contractor to reimburse the City for overtime inspection is established at direct-labor and overtime costs for each person or inspector required. Incidental overtime costs for engineering, testing and other related services will also be charged to the Contractor at the actual rate accrued.
- 8.11 Patent Fee and Royalties: The Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work, or any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. The Contractor hereby expressly binds himself or itself to indemnify and save harmless the City from all such claims and fees and from any and all suits and action of every name and description that may be brought against City on account of any such claims, fees, royalties, or costs for any such invention or patent, and from any and all suits or actions that may be brought against said City for the infringement of any and all patents or patent rights claimed by any person, firm corporation or other entity.
- 8.12 Permits: The Contractor shall obtain and pay for all permits and licenses. There shall be no allowance for Contractor markup, overhead or profit for permits and licenses. The Contractor shall pay all government charges which are applicable at the time of opening of proposals. It shall be the responsibility of the Contractor to secure and pay for all necessary licenses and permits of a temporary nature necessary for the prosecution of Work.
- 8.13 Law and Regulations: The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the Work. If the Contractor observes that the specifications or plans are at variance therewith, the Contractor shall give the Project Manager prompt written notice thereof, and any necessary changes shall be adjusted by any appropriate modifications. If the Contractor performs any work knowing or having reason to know that it is contrary to such laws, ordinances, rules and regulations, and without such notice to the Project Manager, the Contractor shall bear all costs arising therefrom; however, it shall not be the Contractor's primary responsibility to make certain that the specifications and plans are in accordance with such laws, ordinances, rules and regulations.

- 8.14 Taxes: The Contractor shall pay all sales, consumer, use and other similar taxes required to be paid by him in accordance with the laws of the City of Fort Lauderdale, County of Broward, State of Florida.
- 8.15 Contractor Use of Premises: The Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workmen to areas permitted by law, ordinances, permits and/or the requirements of the Contract Documents, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment.

The Contractor shall not enter upon private property for any purpose without first securing the permission of the property owner in writing and furnishing the Project Manager with a copy of said permission. This requirement will be strictly enforced, particularly with regard to such vacant properties as may be utilized for storage or staging by the Contractor.

The Contractor shall conduct his work in such a manner as to avoid damage to adjacent private or public property. Any damage to existing structures of work of any kind, including permanent reference markers or property corner markers, or the interruption of a utility service, shall be repaired or restored promptly at no expense to the City or property owner.

The Contractor will preserve and protect all existing vegetation such as trees, shrubs and grass on or adjacent to the site which do not reasonably interfere with the construction, as determined by the Project Manager. The Contractor will be responsible for repairing or replacing any trees, shrubs, lawns and landscaping that may be damaged due to careless operation of equipment, stockpiling of materials, tracking of grass by equipment or other construction activity. The Contractor will be liable for, or will be required to replace or restore at no expense to the City all vegetation not protected or preserved as required herein that may be destroyed or damaged.

During the progress of the work, the Contractor shall keep the premises free from accumulations of waste materials, rubbish and debris resulting from the Work. At the completion of the Work, the Contractor shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials and shall leave the site clean and ready for occupancy by the City. The Contractor shall restore to their original condition those portions of the site not designated for alteration by the Contract Documents at no cost to the City.

- 8.16 Project Coordination: The Contractor shall provide for the complete coordination of the construction effort. This shall include, but not necessarily be limited to, coordination of the following:

- 8.16.1 Flow of material and equipment from suppliers.
- 8.16.2 The interrelated work with affected utility companies.
- 8.16.3 The interrelated work with the City where tie-ins to existing facilities are required.
- 8.16.4 The effort of independent testing agencies.

8.16.5 Notice to affected property owners as may be directed by the Project Manager.

8.17 Project Record Documents and Final As-Builts (Record Drawings): Contractor shall be responsible for maintaining up-to-date redline as-built drawings, on site, at all times during construction. All as-built information shall be surveyed and verified by a professional land surveyor registered in the State of Florida. Contractor shall provide the City with a minimum of three (3) sets of signed and sealed record drawings (Final As-Builts) and a CD of the electronic drawings files created in AutoCad 2014 or later. All costs associated with survey work required for construction layout and as-built preparation shall be the responsibility of the Contractor.

8.18 Safety and Protection:

8.18.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

8.18.1.1 All employees working on the project and other persons who may be affected thereby.

8.18.1.2 All the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site.

8.18.1.3 Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

8.18.2 The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. The Contractor shall notify owners of adjacent property and utilities when execution of the Work may affect them at least seventy-two (72) hours in advance (unless otherwise required). All damage, injury or loss to any property caused, directly or indirectly, in whole or in part by the Contractor, any subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, shall be remedied by the Contractor. The Contractor's duties and responsibilities for safety and protection of the Work shall continue until such time as all the Work is completed and accepted by the City.

8.19 Emergencies: In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the City is obligated to act to prevent threatened damage, injury or loss. The Contractor shall give the Project Manager prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby.

8.20 Risk of Loss: The risk of loss, injury or destruction shall be on the Contractor until acceptance of the Work by the City. Title to the Work shall pass to the City upon acceptance of the Work by the City.

8.21 Environmental: The Contractor has fully inspected the Premises and agrees, except as to the presence of any asbestos, to accept the Premises in an “as is” physical condition, without representation or warranty by the City of any kind, including, without limitation, any and all existing environmental claims or obligations that may arise from the presence of any “contamination” on, in or about the Premises. Further, Contractor and all entitles claiming by, through or under the Contractor, releases and discharges the City, from any claim, demand, or cause of action arising out of or relating to the Contractor’s use, handling, storage, release, discharge, treatment, removal, transport, decontamination, cleanup, disposal and/or presence of any hazardous substances including asbestos on, under, from or about the Premises. The Contractor shall have no liability for any pre-existing claims or “contamination” on the Premises.

The Contractor shall not use, handle, store, discharge, treat, remove, transport, or dispose of Hazardous Substances including asbestos at, in, upon, under, to or from the Premises until receipt of instructions from the City. At such time, a City approved Change Order, which shall not include any profit, shall authorize the Contractor to perform such services.

The Contractor shall immediately deliver to the Project Manager complete copies of all notices, demands, or other communications received by the Contractor from any governmental or quasi-governmental authority or any insurance company or board of fire underwriters or like or similar entities regarding in any way alleged violations or potential violations of any Environmental Law or otherwise asserting the existence or potential existence of any condition or activity on the Premises which is or could be dangerous to life, limb, property, or the environment.

For other and additional consideration, the Contractor hereby agrees, at its sole cost and expense, to indemnify and protect, defend, and hold harmless the City and its respective employees, agents, officials, officers, representatives, contractors and subcontractors, successors, and assigns (hereafter the “City”) from and against any and all claims, demands, losses, damages, costs, expenses, including but not limited to mitigation, restoration, and natural restoration expenses, liabilities, assessments, fines, penalties charges, administrative and judicial proceedings and orders, judgments, causes of action, in law or in equity, remedial action requirements and/or enforcement actions of any kind (including, without limitation, attorneys’ fees and costs) directly or indirectly arising out of or attributable to, in whole or in part, the Contractor’s use, handling, storage, release, threatened release, discharge, treatment, removal, transport, decontamination, cleanup, disposal and/or presence of a Hazardous Substance (excluding asbestos) on, under, from, to or about the Premises or any other activity carried on or undertaken on or off the Premises by the Contractor or its employees, agents or subcontractors, in connection with the use, handling, storage, release, threatened release, discharge, treatment, mitigation, natural resource restoration, removal, transport, decontamination, cleanup, disposal and/or presence or any Hazardous Substance including asbestos located, transported, or present on, undue, from, to, or about the Premises. This indemnity is intended to be operable under 42 U.S.C. sections 9607, as amended, and any successor section.

The scope of the indemnity obligations includes, but is not limited to: (a) all consequential damages; (b) the cost of any required or necessary repair, cleanup, or

detoxification of the applicable real estate and the preparation and implementation of any closure, remedial or other required plan, including without limitation; (i) the costs of removal or remedial action incurred by the United States government or the State of Florida or response costs incurred by any other person, or damages from injury to destruction of, or loss of, natural resources, including the cost of assessing such injury, destruction, or loss, incurred pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, as amended; (ii) the clean-up costs, fines, damages, or penalties incurred pursuant to any applicable provisions of Florida law; and (iii) the cost and expenses of abatement, correction or cleanup, fines, damages, response costs, or penalties which arise from the provisions of any other statute, law, regulation, code ordinance, or legal requirement state or federal; and (c) liability for personal injury or property damage arising under any statutory or common law tort theory, including damages assessed for the maintenance of a public private nuisance, response costs, or for the carrying on of an abnormally dangerous activity.

8.22 No Extended Damages: For other and additional good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Contractor covenants and agrees that in the event of any delay of construction or for any other reason or allegation or claim, and notwithstanding the reason of the delay, reason, claim or allegation or who caused them or the construction delay or whether they were caused by the City, that there will be no entitlement to Contractor to or for any direct or indirect financial damages or losses for extended corporate overhead impact, extended project overhead impacts, project support services, mobilization or demobilization or by whatever other label or legal concept or theory and types of names or labels or basis such claims may have, or any business damages or losses of whatever type or nature, and Contractor hereby waives any right to make any such claim or claims. This provision will have application and effect when construction delays are anticipated and agreed upon by both the City and the Contractor.

8.23 No Liens: If any Subcontractor, supplier, laborer, or materialmen of Contractor or any other person directly or indirectly acting for or through Contractor files or attempts to file a mechanic's or construction lien against the real property on which the work is performed or any part or against any personal property or improvements or claim against any monies due or to become due from the City to Contractor or from Contractor to a Subcontractor, for or on account of any work, labor, services, material, equipment, or other items furnished in connection with the Work or any Change Order, Contractor agrees to satisfy, remove, or discharge such lien or claim at its own expense by bond, payment, or otherwise within twenty (20) days of the filing or from receipt of written notice from the City.

Additionally, until such time as such lien or claim is satisfied, removed or discharged by Contractor, all monies due to Contractor, or that become due to Contractor before the lien or claim is satisfied, removed or otherwise discharged, shall be held by City as security for the satisfaction, removal and discharge of such lien and any expense that may be incurred while obtaining such. If Contractor shall fail to do so, City shall have the right, in addition to all other rights and remedies provided by this Agreement or by law, to satisfy, remove, or discharge such lien or claim by whatever means City chooses at the entire and sole cost and expense of Contractor which costs and expenses shall, without limitation, include attorney's fees, litigation costs, fees and expenses and all court costs and assessments.

8.24 Weather Emergencies: Upon issuance of a Hurricane Watch by the National Weather Service, the Contractor shall submit to the City a plan to secure the work area in the event a Hurricane Warning is issued. The plan shall detail how the Contractor will secure the Premises, equipment and materials in a manner as to prevent damage to the Work and prevent materials and equipment from becoming a hazard to persons and property on and around the Premises. The plan shall include a time schedule required to accomplish the hurricane preparations and a list of emergency contacts that will be available and in the City before, during and immediately after the storm. Upon issuance of a Hurricane Warning by the National Weather Service, if the Contractor has not already done so, the Contractor shall implement its hurricane preparedness plan. Cost of development and implementation of the hurricane preparedness plan shall be considered as incidental to construction. Cost of any clean up and rework required after the storm will be considered normal construction risk within Florida and shall not entitle the Contractor to any additional compensation. Contractor shall be entitled to request an extension in time for completion of the Work, in accordance with the provisions of Article 15 of this Agreement, equal to the time he is shut down for implementation of the preparedness plan, the duration of the storm and a reasonable period to restore the Premises.

8.25 Force Majeure: No Party shall hold the other responsible for damages or for delays in performance caused by force majeure, acts of God, or other acts or circumstances beyond the control of the other party or that could not have been reasonably foreseen and prevented. For this purposes, such acts or circumstances shall include, but not be limited to weather conditions affecting performance, floods, epidemics, war, riots, strikes, lockouts, or other industrial disturbances, or protest demonstrations. Should such acts or circumstances occur, the parties shall use their best efforts to overcome the difficulties arising therefrom and to resume the Work as soon as reasonably possible with the normal pursuit of the Work.

Inclement weather, continuous rain for less than three (3) days or the acts or omissions of subcontractors, third-party contractors, materialmen, suppliers, or their subcontractors, shall not be considered acts of force majeure.

No Party shall be liable for its failure to carry out its obligations under the Agreement during a period when such Party is rendered unable by force majeure to carry out its obligation, but the obligation of the Party or Parties relying on such force majeure shall be suspended only during the continuance of the inability and for no longer period than the unexpected or uncontrollable event.

The Contractor further agrees and stipulates, that its right to excuse its failure to perform by reason of force majeure shall be conditioned upon giving written notice of its assertion that a Force Majeure delay has commenced within 96 hours after such an occurrence. The CONTRACTOR shall use its reasonable efforts to minimize such delays. The CONTRACTOR shall promptly provide an estimate of the anticipated additional time required to complete the Project.

8.26 Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assisted Contracts: The recipient shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of any DOT-assisted

contract or in the administration of its DBE program or the requirements of 49 CFR part 26. The recipient shall take all necessary and reasonable steps under 49 CFR part 26 to ensure nondiscrimination in the award and administration of DOT-assisted contracts. The recipient's DBE program, as required by 49 CFR part 26 and as approved by DOT, is incorporated by reference in this agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the recipient of its failure to carry out its approved program, the Department may impose sanctions as provided for under part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31 U.S.C. 3801 *et seq.*).

Additionally, the contractor assures that they, the sub recipient or the subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate. (This additional language must be included in each subcontract the prime contractor signs with a subcontractor.)

## **ARTICLE 9 – CITY’S RESPONSIBILITIES**

- 9.1 The City shall furnish the data required of the City under the Contract Documents promptly and shall make payments to the Contractor promptly after they are due as provided in Article 7.
- 9.2 The City’s duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in the Contract Documents.
- 9.3 Technical Clarifications and Interpretations:
- 9.3.1 The City shall issue, with reasonable promptness, such written clarifications or interpretations of the Contract Documents as it may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. Should the Contractor fail to request interpretation of questionable items in the Contract Documents, the City shall not entertain any excuse for failure to execute the Work in a satisfactory manner.
- 9.3.2 The City shall interpret and decide matters concerning performance under the requirements of the Contract Documents, and shall make decisions on all claims, disputes or other matters in question. Written notice of each claim, dispute or other matter will be delivered by claimant to the other Party but in no event later than five (5) days after the occurrence of event, and written supporting data will be submitted to the other Party within five (5) days after such occurrence. All written decisions of the City on any claim or dispute will be final and binding.
- 9.4 The Contractor shall perform all Work to the reasonable satisfaction of the City in accordance with the Contract Documents. In cases of disagreement or ambiguity, the

City shall decide all questions, difficulties, and disputes of whatever nature, which may arise under or by reason of this Agreement or the quality, amount and value of the Work, and the City's decisions on all claims, questions and determination are final.

## ARTICLE 10 – BONDS AND INSURANCE

10.1 Public Construction and Other Bonds: The Contractor shall furnish Public Construction or Performance and Payment Bonds ("Bond"), each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all the Contractor's obligations under the Contract Documents. These Bonds shall remain in effect until at least one (1) year after the date of final payment, except as otherwise provided by law. All Bonds shall be furnished and provided by the surety and shall be in substantially the same form as prescribed by the Contract Documents and be executed by such sureties as (i) are licensed to conduct business in the State of Florida, and (ii) are named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department and (iii) otherwise meet the requirements set forth herein that apply to sureties. All Bonds signed by an agent must be accompanied by a certified copy of the authority to act.

10.1.1 Performance Bond: A Corporate Surety Bond legally issued, meeting the approval of, and running to the City in an amount not less than the Contract Price of such improvements, conditioned that the Contractor shall maintain and make all repairs to the improvements constructed by the Contractor at their own expense and free of charge to the City, for the period of one (1) year after the date of acceptance of the Work within such period by reason of any imperfection of the material used or by reason of any defective workmanship, or any improper, imperfect or defective preparation of the base upon which any such improvement shall be laid.

The Contractor shall execute and record in the public records of Broward County, Florida, a payment and performance bond in an amount at least equal to the Contract Price with a surety insurer authorized to do business in the State of Florida as surety, ("Bond"), in accordance with Section 255.05, Florida Statutes (2014), as may be amended or revised, as security for the faithful performance and payment of all of the Contractor's obligations under the Contract Documents.

10.2 Disqualification of Surety: If the Surety on any Bond furnished by the Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in the State of Florida or it ceases to meet the requirements of clauses (i) and (ii) of Paragraph 10.1, the Contractor shall within five (5) days thereafter substitute another Bond and Surety, both of which shall be acceptable to the City.

10.3 Insurance

10.3.1 As a condition precedent to the effectiveness of this Agreement, during the term of this Agreement and during any renewal or extension term of this Agreement, the Contractor, at the Contractor's sole expense, shall provide insurance of such types and with such terms and limits as noted below. Providing proof of

and maintaining adequate insurance coverage are material obligations of the Contractor. The Contractor shall provide the City a certificate of insurance evidencing such coverage. The Contractor's insurance coverage shall be primary insurance for all applicable policies. The limits of coverage under each policy maintained by the Contractor shall not be interpreted as limiting the Contractor's liability and obligations under this Agreement. All insurance policies shall be from insurers authorized to write insurance policies in the State of Florida and that possess an A.M. Best rating of A-, VII or better. All insurance policies are subject to approval by the City's Risk Manager.

The coverages, limits, and endorsements required herein protect the interests of the City, and these coverages, limits, and endorsements may not be relied upon by the Contractor for assessing the extent or determining appropriate types and limits of coverage to protect the Contractor against any loss exposure, whether as a result of this Agreement or otherwise. The requirements contained herein, as well as the City's review or acknowledgement, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Contractor under this Agreement.

The following insurance policies and coverages are required:

#### 10.3.2 Commercial General Liability

Coverage must be afforded under a Commercial General Liability policy with limits not less than:

- \$1,000,000 each occurrence and \$2,000,000 aggregate for Bodily Injury, Property Damage, and Personal and Advertising Injury
- \$1,000,000 each occurrence and \$2,000,000 aggregate for Products and Completed Operations

Policy must include coverage for Contractual Liability and Independent Contractors.

The City and the City's officers, employees, and volunteers are to be covered as additional insureds with a CG 20 26 04 13 Additional Insured – Designated Person or Organization Endorsement or similar endorsement providing equal or broader Additional Insured Coverage with respect to liability arising out of activities performed by or on behalf of the Contractor. The coverage shall contain no special limitation on the scope of protection afforded to the City or the City's officers, employees, and volunteers.

#### 10.3.3 Business Automobile Liability

Coverage must be afforded for all Owned, Hired, Scheduled, and Non-Owned vehicles for Bodily Injury and Property Damage in an amount not less than \$1,000,000 combined single limit each accident.

If the Contractor does not own vehicles, the Contractor shall maintain coverage for Hired and Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

#### 10.3.4 Workers' Compensation and Employer's Liability

Coverage must be afforded per Chapter 440, Florida Statutes. Any person or entity performing work for or on behalf of the City must provide Workers'

Compensation insurance. Exceptions and exemptions will be allowed by the City's Risk Manager, if they are in accordance with Florida Statute.

The Contractor waives, and the Contractor shall ensure that the Contractor's insurance carrier waives, all subrogation rights against the City and the City's officers, employees, and volunteers for all losses or damages. The City requires the policy to be endorsed with WC 00 03 13 Waiver of our Right to Recover from Others or equivalent.

The Contractor must be in compliance with all applicable State and federal workers' compensation laws, including the U.S. Longshore Harbor Workers' Act and the Jones Act, if applicable.

#### Insurance Certificate Requirements

- a. The Contractor shall provide the City with valid Certificates of Insurance (binders are unacceptable) no later than thirty (30) days prior to the start of work contemplated in this Agreement.
- b. The Contractor shall provide to the City a Certificate of Insurance having a thirty (30) day notice of cancellation; ten (10) days' notice if cancellation is for nonpayment of premium.
- c. In the event that the insurer is unable to accommodate the cancellation notice requirement, it shall be the responsibility of the Contractor to provide the proper notice. Such notification will be in writing by registered mail, return receipt requested, and addressed to the certificate holder.
- d. In the event the Agreement term goes beyond the expiration date of the insurance policy, the Contractor shall provide the City with an updated Certificate of Insurance no later than ten (10) days prior to the expiration of the insurance currently in effect. The City reserves the right to suspend the Agreement until this requirement is met.
- e. The Certificate of Insurance shall indicate whether coverage is provided under a claims-made or occurrence form. If any coverage is provided on a claims-made form, the Certificate of Insurance must show a retroactive date, which shall be the effective date of the initial contract or prior.
- f. The City shall be named as an Additional Insured on all liability policies, with the exception of Workers' Compensation.
- g. The City shall be granted a Waiver of Subrogation on the Contractor's Workers' Compensation insurance policy.
- h. The title of the Agreement, Bid/Contract number, event dates, or other identifying reference must be listed on the Certificate of Insurance.

#### The Certificate Holder should read as follows:

City of Fort Lauderdale  
100 N. Andrews Avenue  
Fort Lauderdale, FL 33301

The Contractor has the sole responsibility for the payment of all insurance premiums and shall be fully and solely responsible for any costs or expenses as a result of a coverage deductible, co-insurance penalty, or self-insured retention; including any loss not covered because of the operation of such deductible, co-insurance penalty, self-insured retention, or coverage exclusion or limitation. Any costs for adding the City as an Additional Insured shall be at the Contractor's expense.

If the Contractor's primary insurance policy/policies do not meet the minimum requirements, as set forth in this Agreement, the Contractor may provide evidence of an Umbrella/Excess insurance policy to comply with this requirement.

The Contractor's insurance coverage shall be primary insurance as applied to the City and the City's officers, employees, and volunteers. Any insurance or self-insurance maintained by the City covering the City, the City's officers, employees, or volunteers shall be non-contributory.

Any exclusion or provision in the insurance maintained by the Contractor that excludes coverage for work contemplated in this Agreement shall be unacceptable and shall be considered breach of contract.

All required insurance policies must be maintained until the contract work has been accepted by the City, or until this Agreement is terminated, whichever is later. Any lapse in coverage shall be considered breach of contract. In addition, Contractor must provide to the City confirmation of coverage renewal via an updated certificate should any policies expire prior to the expiration of this Agreement. The City reserves the right to review, at any time, coverage forms and limits of Contractor's insurance policies.

The Contractor shall provide notice of any and all claims, accidents, and any other occurrences associated with this Agreement shall be provided to the Contractor's insurance company or companies and the City's Risk Management office as soon as practical.

It is the Contractor's responsibility to ensure that any and all of the Contractor's independent contractors and subcontractors comply with these insurance requirements. All coverages for independent contractors and subcontractors shall be subject to all of the applicable requirements stated herein. Any and all deficiencies are the responsibility of the Contractor.

### 10.3.5 ADDITIONAL REQUIRED COVERAGES (for specialty contracts as determined by Risk Management)

#### 10.3.5.1 Disposal Coverage

The Contractor shall designate the disposal site and furnish a Certificate of Insurance from the disposal facility for Environmental Impairment Liability Insurance, covering liability for sudden and accidental occurrences in an amount not less than \$1,000,000 per claim and shall include liability for non-sudden occurrences in an amount not less than \$1,000,000 per claim.

#### 10.3.5.2 Umbrella/Excess Liability:

The Contractor shall provide umbrella/excess coverage with limits of no less than \$2,000,000 excess of Commercial General Liability, Automobile Liability and Employer's Liability.

**NOTE: CITY PROJECT NUMBER AND NAME MUST APPEAR ON EACH CERTIFICATE, AND THE CITY OF FORT LAUDERDALE MUST BE NAMED ON THE CERTIFICATE AS AN “ADDITIONAL INSURED” ON ALL LIABILITY POLICIES, WITH THE EXCEPTION OF WORKERS’ COMPENSATION.**

**A Sample Insurance Certificate shall be included with the proposal to demonstrate the firm’s ability to comply with insurance requirements. Provide a previous certificate or other evidence listing the insurance companies’ names for all required coverage, and the dollar amounts of the coverage.**

**ARTICLE 11- WARRANTY AND GUARANTEE, TESTS AND INSPECTIONS, CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

- 11.1 Warranty: The Contractor warrants and guarantees to the City that all Work will be in accordance with the Contract Documents and will not be defective. Prompt notice of all defects shall be given to the Contractor. All defective work, whether or not in place, may be rejected, corrected or accepted as provided in this Article.
- 11.1.1 Warranty of Title: The Contractor warrants to the City that it possesses good, clear and marketable title to all equipment and materials provided and that there are no pending liens, claims or encumbrances against the equipment and materials.
- 11.1.2 Warranty of Specifications: The Contractor warrants that all equipment, materials and workmanship furnished, whether furnished by the Contractor, its subcontractors or suppliers, will comply with the specifications, drawings and other descriptions supplied or adopted and that all services will be performed in a workmanlike manner.
- 11.1.3 Warranty of Merchantability: The Contractor warrants that any and all equipment to be supplied pursuant to this Agreement is merchantable, free from defects, whether patent or latent in material or workmanship, and fit for the ordinary purposes for which it is intended.
- 11.2 Tests and Inspections: Contractor shall retain the services of an independent, certified, testing lab to perform all testing as required by the specifications, Contract drawings, and any applicable permitting agency. Contractor shall provide evidence of certification to the City before the work and testing is done. Testing results shall be submitted to the Engineer for review and approval at the time the results are provided to the Contractor. The Contractor shall give the Project Manager and City Inspector a minimum of twenty-four (24) hours’ advanced notice of readiness of the Work for all required inspections, tests, or approvals and shall notify all applicable permitting agencies in a timely manner based on requirements set forth in the permit documents.
- 11.2.1 Neither observations by the Project Manager nor inspections, tests or approvals by others shall relieve the Contractor from its obligations to perform the Work in accordance with the Contract Documents.

- 11.3 Uncovering Work: If any work that is to be inspected, tested or approved is covered without approval or consent of the Project Manager, it must, if requested by the Project Manager, be uncovered for observation and/or testing. Such uncovering and replacement shall be at the Contractor's sole expense unless the Contractor has given the Project Manager timely notice of the Contractor's intention to cover such Work and the Project Manager has not acted with reasonable promptness in response to such notice.
- 11.3.1 If the Project Manager considers it necessary or advisable that Work covered in accordance with Paragraph 11.2.1, 11.2.2 and 11.2.3 be observed by the City or inspected or tested by others, the Contractor at the City's request, shall uncover, expose or otherwise make available for observation, inspection or testing as the Project Manager may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, the Contractor shall bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, including compensation for additional professional services, and an appropriate deductive Change Order shall be issued. If, however, such work is not found to be defective, the Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection testing and reconstruction if he makes a claim therefore as provided in Articles 14 and 15.
- 11.4 City May Stop the Work: If the Work is defective, or the Contractor fails to supply sufficient skilled supervisory personnel or workmen or suitable materials or equipment or the work area is deemed unsafe, the City may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the City to stop the Work shall not give rise to any duty on the part of the City to exercise this right for the benefit of the Contractor or any other party. The City will not award any increase in Contract Price or Contract Time if the Work is stopped due to the circumstances described herein.
- 11.5 Correction or Removal of Defective Work Before Final Payment: If required by the Project Manager, the Contractor shall promptly, without cost to the City and as Specified by the Project Manager, either correct any defective Work, whether or not fabricated, installed or completed, or if the Work has been rejected by the City remove it from the site and replace it with non-defective Work.
- 11.6 One Year Correction Period After Final Payment: If within one (1) year after the date of final acceptance, or such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, any work is found to be defective, the Contractor shall promptly, without cost to the City and in accordance with the City's written instructions, either correct such defective Work, or, if it has been rejected by the City, remove it from the site and replace it with non-defective Work.

If The Contractor does not promptly comply with the terms of such instructions or in an emergency where delay would cause serious risk of loss or damage, the City may have the defective Work corrected or the rejected Work removed and replaced, and all direct and indirect costs for such removal and replacement, including compensation for additional professional services, shall be paid by the Contractor.

- 11.7 Acceptance of Defective Work, Deductions: If, instead of requiring correction or removal and replacement of defective Work, the City, at the city's sole option, prefers to accept it, the City may do so. In such a case, if acceptance occurs prior to the Project Manager's recommendation of final payments, a Change Order shall be issued incorporating the necessary revisions in the Contracts Documents, including appropriate reduction in the Contract Price; or if the acceptance occurs after such recommendation, an appropriate amount shall be paid by the Contractor to the City.
- 11.8 City May Correct Defective Work: If the Contractor fails within a reasonable time after written notice of the Project Manager to proceed to correct defective Work or to remove and replace rejected Work as required by the Project Manager in accordance with Paragraph 11.5, or if the Contractor fails to perform the Work in accordance with the Contract Documents, the City may, after seven (7) days written notice to the Contractor, correct and remedy any such deficiency. In exercising its rights under this paragraph, the City shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, the City may exclude the Contractor from all or part of the site, take possession of all or part of the Work, suspend the Contractor's services related thereto and take possession of the Contractor's tools, construction equipment and materials stored at the site or elsewhere. The Contractor shall allow the City's representative agents and employees such access to the site as may be necessary to enable the City to exercise its rights under this paragraph. All direct and indirect costs of the City in exercising such rights shall be charged against the Contractor in an amount verified by the Project Manager, and a Change Order shall be issued incorporating the necessary revisions in the Contract Documents and a reduction in the Contract Price. Such direct and indirect costs shall include, in particular but without limitation, compensation for additional professional services required and costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of the Contractor's defective Work. The Contractor shall not be allowed an extension of the Contract Time because of any delay in performance of the Work attributable to the exercise by the City of the City's right hereunder.

## ARTICLE 12 – INDEMNIFICATION

- 12.1 Disclaimer of Liability: The City shall not at any time, be liable for injury or damage occurring to any person or property from any cause, whatsoever, arising out of Contractor's construction and fulfillment of this agreement.
- 12.2 Indemnification: For other, additional good valuable consideration, the receipt and sufficiency of which is hereby acknowledged:
- 12.2.1 Contractor shall, at its sole cost and expense, indemnify and hold harmless the City, its representatives, employees and elected and appointed officials from or on account of all claims, damages, losses, liabilities and expenses, direct, indirect or consequential including but not limited to fees and charges of engineers, architects, attorneys, consultants and other professionals and court costs arising out of or in consequence of the performance of this Agreement at all trial and appellate levels. Indemnification shall specifically include but not be limited to claims, damages, losses, liabilities and expenses arising out of or from (a) the negligent or defective design of the project and Work of this

Agreement; (b) any act, omission or default of the Contractor, its Subcontractors, agents, servants or employees; (c) any and all bodily injuries, sickness, disease or death; (d) injury to or destruction of tangible property, including any resulting loss of use; (e) other such damages, liabilities, or losses received or sustained by any person or persons during or on account of any operations connected with the construction of this Project including the warranty period; (f) the use of any improper materials; (g) any construction defect including both patent and latent defects; (h) failure to timely complete the work; (i) the violation of any federal, state, county or city laws, ordinances or regulations by Contractor, its subcontractors, agents, servants, independent contractors or employees; (j) the breach or alleged breach by Contractor of any term of the Agreement, including the breach or alleged breach of any warranty or guarantee.

- 12.2.2 Contractor agrees to indemnify, defend, save and hold harmless the City, its officers, agents and employees, from all damages, liabilities, losses, claims, fines and fees, and from any and all suits and actions of every name and description that may be brought against City, its officers, agents and employees, on account of any claims, fees, royalties, or costs for any invention or patent and/or for the infringement of any and all copyrights or patent rights claimed by any person, firm, or corporation.
- 12.2.3 Contractor shall pay all claims, losses, liens, settlements or judgments of any nature in connection with the foregoing indemnifications including, but not limited to, reasonable attorney's fees and costs for trails and appeals.
- 12.2.4 If any Subcontractor, supplier, laborer, or materialmen of Contractor or any other person directly or indirectly acting for or through Contractor files or attempts to file a mechanic's or construction lien against the real property on which the work is performed or any part or against any personal property or improvements thereon or make a claim against any monies due or to become due from the City to Contractor or from Contractor to a Subcontractor, for or on account of any work, labor, services, material, equipment, or other items furnished in connection with the Work or any change order, Contractor agrees to satisfy, remove, or discharge such lien or claim at its own expense by bond, payment, or otherwise within five (5) days of the filing or from receipt of written notice from the City.

Additionally, until such time as such lien or claim is satisfied, removed or discharged by Contractor, all monies due to Contractor, or that become due to Contractor before the lien or claim is satisfied, removed or otherwise discharged, shall be held by City as security for the satisfaction, removal and discharge of such lien and any expense that may be incurred while obtaining the discharge. If Contractor shall fail to do so, City shall have the right, in addition to all other rights and remedies provided by this Agreement or by law, to satisfy, remove, or discharge such lien or claim by whatever means City chooses at the entire and sole cost and expense of Contractor which costs and expenses shall, without limitation, include attorney's fees, litigation costs, fees and expenses and all court costs and assessments, and which shall be deducted from any amount owing to Contractor. In the event the amount due

Contractor is less than the amount required to satisfy Contractor's obligation under this, or any other article, paragraph or section of this Agreement, the Contractor shall be liable for the deficiency due the City.

12.2.5 The Contractor and the City agree that Section 725.06(2), Florida Statutes controls the extent and limits of the indemnification and hold harmless provisions of this Agreement, if any, and that the parties waive any defects in the wording of this Article that runs afoul of said statutory section.

### **ARTICLE 13 – CHANGES IN THE WORK**

- 13.1 Without invalidating this Agreement, the City may, at any time or from time to time order additions, deletions or revisions in the Work through the issuance of Change Orders. Upon receipt of a Change Order, the Contractor shall proceed with the Work involved. All Work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment will be made as provided in Article 14 or Article 15 on the basis of a claim made by either Party.
- 13.2 The Project Manager may authorize minor changes in the work not involving an adjustment in the Contract Price or the Contract Time, which are consistent with the overall intent of the Contract Documents. Such changes must be in writing and signed by the City and the Contractor.
- 13.3 If notice of any change affecting the general scope of the Work or change in the Contract Price is required by the provisions of any Bond to be given to the Surety, it will be the Contractor's responsibility to so notify the Surety, and the amount of each applicable Bond shall be adjusted accordingly. The Contractor shall furnish proof of such adjustment to the City.

### **ARTICLE 14 – CHANGE OF CONTRACT PRICE**

Change of Contract Price, approved by City, shall be computed as follows:

- 14.1 Cost of the Work: The term "Cost of the Work" means the sum of all direct costs necessarily incurred and paid by Contractor in the proper performance of the Work. Except as otherwise may be agreed to in writing by the City, these costs shall be in amounts no higher than those prevailing in the City and shall include only the following items and shall not include any of the costs itemized in Paragraph 14.3:
- 14.1.1 Payroll costs for employees in the direct employ of the Contractor in the performance of the Work under schedules of job classifications agreed upon by the City and the Contractor. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus and cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, worker's compensation, health and retirement benefits, bonuses, sick leave, vacation and applicable holiday pay.

14.1.2 Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage, and required suppliers and field services. All cash discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to the City, and the Contractor shall make provisions so that they may be obtained.

14.1.3 Supplemental costs including the following:

- 14.1.3.1 Cost, including transportation and maintenance of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work.
- 14.1.3.2 Rentals of all construction equipment and machinery and the parts whether rented from the Contractor or others in accordance with rental agreements approved by the City, and the costs of transporting, loading, unloading, installation, dismantling and removal. The rental of any such equipment, machinery or parts shall cease when the use is no longer necessary for the Work.
- 14.1.3.3 Sales, consumer, use or similar taxes related to the Work and for which the Contractor is liable, imposed by laws and regulations.
- 14.1.3.4 Royalty payments and fees for permits and licenses.
- 14.1.3.5 The cost of utilities, fuel and sanitary facilities at the Work site.
- 14.1.3.6 Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.
- 14.1.3.7 Cost of premiums for additional bonds and insurance required because of changes in the Work.

14.2 The Contract Price may only be increased by a Change Order when Work is modified in accordance with Article 13 and approved by the City in writing. Any claim for an increase in the Contract Price resulting from a Change Order shall be based on written notice delivered to the Project Manager within ten (10) days of the occurrence of the Change Order giving rise to the claim. Notice of the amount of the claim with supporting data shall be included in the Change Order and delivered within twenty (20) days of such occurrence unless Project Manager allows an additional period of time to ascertain accurate cost data. Any change in the Contract Price resulting from any such claim shall be incorporated in the Change Order. **IT IS EXPRESSLY AND SPECIFICALLY AGREED THAT ANY AND ALL CLAIMS FOR CHANGES TO THE CONTRACT PRICE SHALL BE WAIVED IF NOT SUBMITTED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION.**

14.3 Not Included in the Cost of the Work: The term "cost of the Work" shall not include any of the following:

- 14.3.1 Payroll costs and other compensation of the Contractor's officers executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditor, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by the Contractor whether at the site or in the Contractor's principal or branch office for general administration of the work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 14.1.1, all of which are to be considered administrative costs covered by the Contractor's fee.
- 14.3.2 Expenses of the Contractor's principal and branch offices other than the Contractor's office at the site.
- 14.3.3 Any part of the Contractor's capital expenses, including interest on the Contractor's capital employed for the Work and charges against the Contractor for delinquent payments.
- 14.3.4 Cost of premiums for all bonds and for all insurance whether or not the Contractor is required by the Contract Documents to purchase and maintain the same.
- 14.3.5 Costs due to the negligence of the Contractor, any subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied and making good any damage to property.
- 14.3.6 Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 14.1
- 14.4 Basis of Compensation: The Contractor's compensation, allowed to the Contractor for overhead and profit, shall be determined as follows:
- 14.4.1 A mutually acceptable negotiated fee:
- 14.4.1.1 For costs incurred under Paragraphs 14.1.1 and 14.1.2, the Contractor's fee shall not exceed five percent (5%).
- 14.4.1.2 No fee shall be payable on the basis of costs itemized under Paragraphs 14.1.3.1, 14.1.3.2, 14.1.3.3, 14.1.3.4, 14.1.3.5, 14.1.3.6, 14.1.3.7, 14.3.1, 14.3.2, 14.3.3, 14.3.4, 14.3.5 and 14.3.6.
- 14.4.1.3 The amount of credit to be allowed by the Contractor to the City for any such change which results in a net decrease plus a deduction in the Contractor's fee by an amount equal to five percent (5%) for the net decrease.
- 14.4.1.4 When both additions and credits are involved in any one change the combined overhead and profit shall be figured on the basis of net

increase if any, however, not to exceed five percent (5%) of the agreed compensation. Profit will not be paid on any Work not performed.

14.5 Cost Breakdown Required: Whenever the cost of any Work is to be determined pursuant to this Article, the Contractor will submit in form acceptable to the City an itemized cost breakdown together with supporting documentation. Whenever a change in the Work is to be based upon mutual acceptance of a lump sum, whether the amount is an addition, credit, or no-charge-in-cost, the Contractor shall submit an estimate substantiated by a complete itemized breakdown:

14.5.1 The breakdown shall list quantities and unit prices for materials, labor, equipment and other items of cost.

14.5.2 Whenever a change involves the Contractor and one (1) or more subcontractors and the change is an increase in the agreed compensation, the overhead and profit percentage for the Contractor and each subcontractor shall be itemized separately.

14.6 Time for the City to Approve Extra Work: Any Extra Work in an amount up to and not exceeding a cumulative amount of \$25,000 for a specific project can be approved by the City Manager and shall require a written Change Order proposal to be submitted to the Public Works Director for submittal and approval by the City Manager. Extra Work exceeding the cumulative amount of \$25,000 for a specific project must be approved by the City Commission and a written Change Order proposal must be submitted to the Public Works Director for submittal and approval by the City Manager and City Commission. No financial or time claim for delay to the project resulting from the Change Order approval process outlined above under Section 14.6 will be allowed.

## **ARTICLE 15 – CHANGE OF THE CONTRACT TIME**

15.1 The Contract Time may only be changed by a Change Order. Any claim for an extension in the Contract Time shall be based on written notice delivered to the Project Manager within five (5) days of the occurrence of the event giving rise to the claim. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.

15.2 The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of the Contractor if a claim is made there for as provided in Paragraph 15.1. Such delays shall include but not be limited to, acts or neglect by the City, or to fires, floods, labor disputes, epidemics, abnormal weather conditions, or acts of God.

15.3 All time limits stated in the Contract Documents are of the essence. The provisions of this Article 15 shall not exclude recovery for damages for delay by the Contractor.

15.4 Delays caused by or resulting from entities, contractors or subcontractors who are not affiliated with the CONTRACTOR (non-affiliated Contractors) shall not give rise to a claim by the CONTRACTOR for damages for increases in material and/or labor costs. Such entities, contractors and subcontractors include, but are not limited to, the City's contractors and subcontractors, Florida Power and Light Company, AT&T and Florida East Coast Railway, LLC.

- 15.5 Rights of Various Interests: Whenever work being done by City's forces or by other contractors is contiguous to or within the limits of work covered by this Contract, the respective rights of the various interests involved shall be established by the Project Manager to secure the completion of the various portions of the work in general harmony.

## ARTICLE 16 – LIQUIDATED DAMAGES

- 16.1 Upon failure of the Contractor to complete the Work within the time specified for completion, the Contractor shall pay to the City the sum of **\$500 Hundred Dollars (\$500.00)** for each and every calendar day that the completion of the Work is delayed beyond the time specified in this Agreement for completion, as fixed and agreed liquidated damages and not as a penalty, so long as the delay is caused by the Contractor. Should an act of God or the acts or omissions of the City, its agents or representatives, in derogation to the terms of this Agreement cause the delay, the Contractor shall not be responsible for the delay nor liquidated damages. Liquidated damages are fixed and agreed upon between the Parties, recognizing the impossibility of precisely ascertaining the amount of damages that will be sustained by the City as a consequence of such delay and both parties desiring to obviate any question of dispute concerning the amount of damages and the cost and effect of the failure of the Contractor to complete the Work on time. Liquidated damages shall apply separately to each portion of the Work for which a time of completion is given. The City shall have the right to deduct from or retain any compensation which may be due or which may become due and payable to the Contractor the amount of liquidated damages, and if the amount retained by the City is insufficient to pay in full such liquidated damages, the Contractor shall pay all liquidated damages in full. The Contractor shall be responsible for reimbursing the City, in addition to liquidated damages or other damages for delay, for all costs of engineering, architectural fees, and inspection and other costs incurred in administering the construction of the Project beyond the completion date specified or beyond an approved extension of time granted to the Contractor whichever is later. Delays caused by or resulting from entities, contractors or subcontractors who are not affiliated with the Contractor shall not give rise to a claim by Contractor for damages for increase in material and/or labor costs. Such entities, contractors and subcontractors include, but are not limited to, the City's contractors and subcontractors, Florida Power and Light Company, AT&T, and Florida East Coast Railway, LLC.
- 16.2 No Extended Damages: For other and additional good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Contractor covenants and agrees that in the event of any delay of construction or for any reason, allegation or claim, and notwithstanding the reason of the delay, reason, claim or allegation or who caused them or the construction delay or whether they were caused by the City, that there will be no entitlement to Contractor to or for any direct or indirect financial damages or losses for extended corporate overhead impact, extended project overhead impacts, project support services, mobilization or demobilization or by whatever other label or legal concept or theory and types of names or labels or basis such claims may have, or any business damages or losses of whatever type or nature,

and Contractor hereby waives any right to make any such claim or claims. This provision will have application and effect when construction delays are anticipated and agreed upon by both the City and the Contractor.

## ARTICLE 17 – SUSPENSION OF WORK AND TERMINATION

- 17.1 City May Suspend Work: The City may, at any time and without cause, suspend the Work or any portion of the Work for a period of not more than ninety (90) days by notice in writing to the Contractor which shall fix the date on which Work shall be resumed. The Contractor shall resume the Work on the date fixed. The Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension, if the Contractor makes a claim as provided in Articles 14 and 15.
- 17.2 City's Right to Terminate Contract: The City may terminate this Agreement upon fifteen (15) calendar days' written notice upon the occurrence of any one or more of the following events:
- 17.2.1 If the Contractor commences a voluntary case or a petition is filed against the Contractor, under any chapter of the Bankruptcy Code, or if the Contractor takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to the bankruptcy or insolvency.
- 17.2.2 If the Contractor makes a general assignment for the benefit of creditors.
- 17.2.3 If a trustee, receiver, custodian or agent of the Contractor is appointed under applicable law or under Contract, whose appointment or authority to take charge of property of the Contractor is for the purpose of enforcing a lien against such property or for the purpose of general administration of such property for the benefit of the Contractor's creditors.
- 17.2.4 If Contractor fails to begin the Work within fifteen (15) calendar days after the Project Initiation Date, or fails to perform the Work with sufficient workers and equipment or with sufficient materials to ensure the prompt completion of the Work, or shall perform the Work unsuitably, or cause it to be rejected as defective and unsuitable, or shall discontinue the prosecution of the Work pursuant to the accepted schedule or if Contractor shall fail to perform any material term set forth in the Contract Documents, or from any other cause whatsoever shall not carry on the Work in an acceptable manner, Project Manager may give notice in writing to Contractor and its Surety of such delay, neglect or default, specifying the same.
- 17.2.5 If the Contractor repeatedly fails to make prompt payments to subcontractors or for labor, material or equipment.
- 17.2.6 If the Contractor repeatedly disregards proper safety procedures.
- 17.2.7 If the Contractor disregards any local, state or federal laws or regulations.

17.2.8 If the Contactor otherwise violates any provisions of this Agreement.

17.3 If Contractor, within a period of ten (10) calendar days after such notice, shall not proceed in accordance therewith, the City may exclude the Contractor from the Work site and take the prosecution of the Work out of the hands of the Contractor, and take possession of the Work and all of the Contractor's tools, appliances, construction equipment and machinery at the site and use them without liability to the City for trespass or conversion, incorporate in the Work all materials and equipment stored at the site or for which the City has paid the Contractor but which are stored elsewhere, and finish the Work as the City may deem expedient. In this instance, the Contractor shall not be entitled to receive any further compensation until the Work is finished.

17.3.1 If after notice of termination of Contractor's right to proceed, it is determined for any reason that Contractor was not in default, the rights and obligations of City and Contractor shall be the same as if the notice of termination had been issued pursuant to the Termination for Convenience clause as set forth in Section 17.5 below.

17.3.2 Upon receipt of Notice of Termination pursuant to Sections 17.2 or 17.5, Contractor shall promptly discontinue all affected work unless the Notice of Termination directs otherwise and deliver or otherwise make available to City all data, drawings, specifications, reports, estimates, summaries and such other information as may have been required by the Contract Documents whether completed or in process.

17.4 If the Contractor commits a default due to its insolvency or bankruptcy, the following shall apply:

17.4.1 Should this Agreement be entered into and fully executed by the parties, funds released and the Contractor (Debtor) files for bankruptcy, the following shall occur:

17.4.1.1 In the event the Contactor files a voluntary petition under 11 U.S.C. 301 or 302, or an order for relief is entered under 11 U.S.C. 303, the Contractor shall acknowledge the extent, validity, and priority of the lien recorded in favor of the City. The Contractor further agrees that in the event of this default, the City shall, at its option, be entitled to seek relief from the automatic stay pursuant to 11 U.S.C. 362. The City shall be entitled to relief from the automatic stay pursuant to 11 U.S.C. 362(d) (1) or (d) (2), and the Contactor agrees to waive the notice provisions in effect pursuant to 11 U.S.C. 362 and any applicable Local Rules of the United States Bankruptcy Court. The Contactor acknowledges that such waiver is done knowingly and voluntarily.

17.4.1.2 Alternatively, in the event the City does not seek stay relief, or if stay relief is denied, the City shall be entitled to monthly adequate protection payments within the meaning of 11 U.S.C. 361. The monthly adequate protection payments shall each be in an amount

determined in accordance with the Note and Mortgage executed by the Contractor in favor of the City.

17.4.1.3 In the event the Contractor files for bankruptcy under Chapter 13 of Title 11, United States Code in addition to the foregoing provisions, the Contractor agrees to cure any amounts in arrears over a period not to exceed twenty-four (24) months from the date of the confirmation order, and such payments shall be made in addition to the regular monthly payments required by the Note and mortgage. Additionally, the Contractor shall agree that the City is over secured and, therefore, entitled to interest and attorney's fees pursuant to 11 U.S.C. 506(b). Such fees shall be allowed and payable as an administrative expense. Further, in the event the Contractor has less than five (5) years of payments remaining on the Note, the Contractor agrees that the treatment afforded to the claim of the City under any confirmed plan of reorganization shall provide that the remaining payments shall be satisfied in accordance with the Note, and that the remaining payments or claim shall not be extended or amortized over a longer period than the time remaining under the Note.

17.4.2 Should this Agreement be entered into and fully executed by the parties, and the funds have not been forwarded to Contractor, the following shall occur:

17.4.2.1 In the event the Contractor files a voluntary petition pursuant to 11 U.S.C. 301 or 302, or an order for relief is entered under 11 U.S.C. 303., the Contractor acknowledges that the commencement of a bankruptcy proceeding constitutes an event of default under the terms of this Agreement. Further, the Contractor acknowledges that this Agreement constitutes an executory contract within the meaning of 11 U.S.C. 365. The Contractor acknowledges that this Agreement is not capable of being assumed pursuant to 11 U.S.C. 365(c)(2), unless the City expressly consents in writing to the assumption. In the event the City consents to the assumption, the Contractor agrees to file a motion to assume this Agreement within ten (10) days after receipt of written consent from the City, regardless of whether the bankruptcy proceeding is pending under Chapter 7, 11, or 13 of Title 11 of the United States Code. The Contractor further acknowledges that this Agreement is not capable of being assigned pursuant to 11 U.S.C. 365(b)(1).

17.5 Termination for Convenience: This Contract may be terminated for convenience in writing by City upon thirty (30) days written notice to Contractor (delivered by certified mail, return receipt requested) of intent to terminate and the date on which such termination becomes effective. In such case, Contractor shall be paid for all work executed and expenses incurred prior to termination in addition to termination settlement costs reasonably incurred by Contractor relating to commitments which had become firm prior to the termination. Payment shall include reasonable profit for work/services satisfactorily performed. No payment shall be made for profit for work/services which have not been performed.

- 17.6 Where the Contractor's service have been so terminated by the City, the termination shall not affect any rights of the City against the Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due the Contractor by the City will not release the Contractor from liability.
- 17.7 The Contractor has no right, authority or ability to terminate the Work except for the wrongful withholding of any payments due the Contractor from the City.

## ARTICLE 18 – DISPUTE RESOLUTION

- 18.1 Resolution of Disputes: Questions, claims, difficulties and disputes of whatever nature which may arise relative to the technical interpretation of the Contract Documents and fulfillment of this Agreement as to the character, quality, amount and value of any work done and materials furnished, or proposed to be done or furnished under or, by reason of, the Contract Documents which cannot be resolved by mutual agreement of Contract Administrator and Contractor shall be submitted to the Consultant for resolution. When either party has determined that a disputed question, claim, difficulty or dispute is at an impasse, that party shall notify the other party in writing and submit the question, claim, difficulty or dispute to the Consultant for resolution. The parties may agree to a proposed resolution at any time without the involvement and determination of the Consultant.
- 18.1.1 Consultant shall notify Contract Administrator and Contractor in writing of Consultant's decision within twenty-one (21) calendar days from the date of the submission of the question, claim, difficulty or dispute, unless Consultant requires time to gather information or allow the parties to provide additional information.
- 18.1.2 In the event the determination of a dispute by the Consultant under this Article is unacceptable to any of the parties hereto, the party objecting to the determination must notify the other party and the City Manager, in writing within ten (10) days after receipt of the determination. The notice must state the basis of the objection and the proposed resolution. Final resolution of such dispute shall be made by the City Manager. The City Manager's decision shall be final and binding on the parties.
- 18.1.3 All non-technical administrative disputes (such as billing and payment) shall be determined by Contract Administrator.
- 18.1.4 During the pendency of any dispute and after a determination thereof, Contractor, Consultant, and Contract Administrator shall act in good faith to mitigate any potential damages including utilization of construction schedule changes and alternate means of construction. During the pendency of any dispute arising under this Agreement, other than termination herein, Contractor shall carry on the Work and adhere to the progress schedule. The Work shall

not be delayed or postponed pending resolution of any disputes or disagreements.

18.1.5 For any disputes which remain unsolved, within sixty (60) calendar days after Final Completion of the Work, the parties shall participate in mediation to address all unresolved disputes. A mediator shall be mutually agreed upon by the parties. Should any objection not be resolved in mediation, the parties retain all their legal rights and remedies under applicable law. If a party objecting to a determination, fails to comply in strict accordance with the requirements of this Article, said party specifically waives all of its rights provided hereunder, including its rights and remedies under applicable law.

**ARTICLE 19 – NOTICES**

19.1 All notices required by any of the Contract Documents shall be in writing and shall be deemed delivered upon mailing by certified mail, return receipt requested to the following:

To the City:

City Manager  
City of Fort Lauderdale  
100 North Andrews Avenue  
Fort Lauderdale, Florida 33301

with copy to the:

Project Manager and City Attorney  
City of Fort Lauderdale  
100 North Andrews Avenue  
Fort Lauderdale, Florida 33301

To the Contractor:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**ARTICLE 20 – LIMITATION OF LIABILITY**

20.1 The City desires to enter into this Agreement only if in so doing the City can place a limit on the City’s liability for any cause of action arising out of this Agreement, so that the City’s liability for any breach never exceeds the sum of \$1,000. For other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Contractor expresses its willingness to enter into this Agreement with the knowledge that the Contractor’s recovery from the City to any action or claim arising from the Agreement is limited to a maximum amount of \$1,000, which amount

shall be reduced by the amount actually paid by the City to the Contractor pursuant to this Agreement, for any action or claim arising out of this Agreement. Nothing contained in this paragraph or elsewhere in this Agreement is in any way intended either to be a waiver of the limitation placed upon the City's liability as set forth in Section 768.28, Florida Statutes, or to extend the City's liability beyond the limits established in said Section 768.28; and no claim or award against the City shall include attorney's fees, investigative costs, expert fees, suit costs or pre-judgment interest.

- 20.2 **No Extended Damages:** For other and additional good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Contractor covenants and agrees that in the event of any delay of construction or for any reason, allegation or claim, and notwithstanding the reason of the delay, reason, claim or allegation or who caused them or the construction delay or whether they were caused by the City, that there will be no entitlement to Contractor to or for any direct or indirect financial damages or losses for extended corporate overhead impact, extended project overhead impacts, project support services, mobilization or demobilization or by whatever other label or legal concept or theory and types of names or labels or basis such claims may have, or any business damages or losses of whatever type or nature, and Contractor hereby waives any right to make any such claim or claims. This provision will have application and effect when construction delays are anticipated and agreed upon by both the City and the Contractor.

#### ARTICLE 21 – GOVERNING LAW

- 21.1 This Agreement shall be governed by the laws of the State of Florida. Both Parties agree that the courts of the State of Florida shall have jurisdiction of any claim arising in connection with this Agreement. Venue for any claim, objection or dispute arising out of this Agreement shall be in Broward County, Florida. **By entering into this Contract, Contractor and City hereby expressly waive any rights either party may have to a trial by jury or any civil litigation related to, or arising out of the Project. Contractor shall specifically bind all subcontractors to the provisions of this Contract.**

#### ARTICLE 22 – MISCELLANEOUS

- 22.1 The duties and obligations imposed by this Agreement and the rights and remedies available to the parties and, in particular but without limitation, the warranties, guaranties and obligations imposed upon the Contractor and all of the rights and remedies available to the City, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by laws or regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents, and the provisions of this Paragraph will survive final payment and termination or completion of this Agreement.
- 22.2 The Contractor shall not assign or transfer this Agreement or its rights, title or interests. The obligations undertaken by the Contractor pursuant to this Agreement shall not be delegated or assigned to any other person or firm. Violation of the terms of this Paragraph shall constitute a material breach of Agreement by the Contractor

and the City any, at its discretion, cancel this Agreement and all rights, title and interest of the Contractor which shall immediately cease and terminate.

- 22.3 The Contractor and its employees, volunteers and agents shall be and remain an independent contractors and not agents or employees of the City with respect to all of the acts and services performed by and under the terms of this Agreement. This Agreement shall not in any way be constructed to create a partnership, association or any other kind of joint undertaking or venture between the Parties.
- 22.4 The City reserves the right to audit the records of the Contractor relating in any way to the Work to be performed pursuant to this Agreement at any time during the performance and term of this Agreement and for a period of three (3) years after completion and acceptance by the City. If required by the City, the Contractor agrees to submit to an audit by an independent certified public accountant selected by the City. The Contractor shall allow the City to inspect, examine and review the records of the Contractor at any and all times during normal business hours during the term of this Agreement.
- 22.5 The remedies expressly provided in this Agreement to the City shall not be deemed to be exclusive but shall be cumulative and in addition to all other remedies in favor of the City now or later existing at law or in equity.
- 22.6 Should any part, term or provisions of this Agreement be decided by the courts to be invalid, illegal or in conflict with any state or federal law, the validity of the remaining portion or provision shall not be affected.
- 22.7 Prohibition Against Contracting With Scrutinized Companies: Subject to *Odebrecht Construction, Inc., v. Prasad*, 876 F.Supp.2d 1305 (S.D. Fla. 2012), *affirmed*, *Odebrecht Construction, Inc., v. Secretary, Florida Department of Transportation*, 715 F.3d 1268 (11th Cir. 2013), with regard to the "Cuba Amendment," the Contractor certifies that it is not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2018), that it is not engaged in a boycott of Israel, and that it does not have business operations in Cuba or Syria, as provided in section 287.135, Florida Statutes (2018), as may be amended or revised. The City may terminate this Agreement at the City's option if the Contractor is found to have submitted a false certification as provided under subsection (5) of section 287.135, Florida Statutes (2018), as may be amended or revised, or been placed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2018), or is engaged in a boycott of Israel or has been engaged in business operations in Cuba or Syria, as defined in Section 287.135, Florida Statutes (2018), as may be amended or revised.
- 22.8 Public Entity Crimes: In accordance with the Public Crimes Act, Section 287.133, Florida Statutes, a person or affiliate who is a contractor, consultant or other provider, who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to the City, may not submit a bid on a contract with the City for the construction or repair of a public building or public work, may not submit bids on leases of real property to the

City, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with the City, and may not transact any business with the City in excess of the threshold amount provided in Section 287.017, Florida Statutes, for category two purchases for a period of thirty-six (36) months from the date of being placed on the convicted vendor list. Violation of this section by Contractor shall result in cancellation of the City purchase and may result in Contractor debarment.

22.9 Attorney Fees: If CITY or CONSULTANT incurs any expense in enforcing the terms of this Agreement through litigation, the prevailing party in that litigation shall be reimbursed for all such costs and expenses, including but not limited to court costs, and reasonable attorney fees incurred during litigation.

22.10 Public Records

**IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT , 954-828-5002, CITY CLERK'S OFFICE, 100 N. ANDREWS AVENUE, FORT LAUDERDALE, FLORIDA 33301.**

Contractor shall:

1. Keep and maintain public records that ordinarily and necessarily would be required by the City in order to perform the service.
2. Upon request from the City's custodian of public records, provide the City with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes (2018), as may be amended or revised, or as otherwise provided by law.
3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of this contract if the Contractor does not transfer the records to the City.
4. Upon completion of the Contract, transfer, at no cost, to the City all public records in possession of the Contractor or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City upon completion of this Contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of this Contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the information technology systems of the City.

Peele-Dixie Water Treatment Plant Chemical Tank Replacements and Degasifier Improvements  
(Contractor)  
Project # 12295

**CITY**

IN WITNESS OF THE FOREGOING, the parties have set their hands and seals the day and year first above written.

CITY OF FORT LAUDERDALE, a municipal corporation of the State of Florida

By: \_\_\_\_\_  
CHRIS LAGERBLOOM, City Manager

(CORPORATE SEAL)

ATTEST:

By: \_\_\_\_\_  
JEFFREY A. MODARELLI  
City Clerk

Approved as to Legal Form:

By: \_\_\_\_\_  
RHONDA MONTOYA HASAN  
Assistant City Attorney

SAMPLE CONSTRUCTION AGREEMENT

**CONTRACTOR**

WITNESSES:

CONTRACTOR.,  
a Florida corporation.

\_\_\_\_\_

By \_\_\_\_\_

\_\_\_\_\_

Print Name

\_\_\_\_\_

PRINT NAME

Title

\_\_\_\_\_

ATTEST:

\_\_\_\_\_

Print Name

BY: \_\_\_\_\_

\_\_\_\_\_

PRINT NAME

Secretary

(CORPORATE SEAL)

STATE OF FLORIDA:  
COUNTY OF BROWARD:

The foregoing instrument was acknowledged before me this \_\_\_\_ day of \_\_\_\_\_, 2018, by \_\_\_\_\_ (Name), as \_\_\_\_\_ (Title) of \_\_\_\_\_ (CONTRACTOR), a Florida corporation, on behalf of the Corporation.

SEAL

\_\_\_\_\_  
Notary Public, State of Florida

\_\_\_\_\_  
Name of Notary Typed, Printed or Stamped

Personally Known or  Produced Identification:

Type of Identification Produced: \_\_\_\_\_

## GC - 01 - GENERAL CONDITIONS

Unless otherwise modified in the projects special conditions, the following General Conditions shall be part of the Contract:

**GC – 01 - DEFINITIONS** - The following words and expressions, or pronouns used in their stead, shall wherever they appear in the Contract and the Contract Documents, be construed as follows:

"Addendum" or "Addenda" - shall mean the additional Contract provisions issued in writing, by the Engineer, prior to the receipt of bids.

"Bid" – shall mean the offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

"Bidder" – shall mean any person, firm, company, corporation or entity submitting a Bid for the Work.

"Bonds" –shall mean Bid, performance and payment bonds and other instruments of security, furnished by Contractor and his surety in accordance with the Contract Documents.

"City" – shall mean the City of Fort Lauderdale, Florida, a Florida municipal corporation. In the event the City exercises its regulatory authority as a government body, the exercise of such regulatory authority and the enforcement of any rules, regulations, codes, laws and ordinances shall be deemed to have occurred pursuant to City's authority as a governmental body and shall not be attributable in any manner to the City as a party to this Contract. For the purpose of this Contract, "City" without modification shall mean the City Commission, and/or City Manager or his/her designee(s) as applicable.

"Construction Manager" - shall mean the Public Works Director or his/her designee.

"Construction Project Manager" - shall mean the Public Works Director or his/her designee.

"Consultant" – shall mean a person, firm, company, corporation or other entity employed by the City to perform the professional services for the project.

"Contract Work" - shall mean everything expressed or implied to be required to be furnished and furnished by the Contractor by any one or more of the parts of the Contract Documents referred to in the Contract hereof except Extra Work as hereinafter defined, it being understood that, in case of any inconsistency in or between any part or parts of this Contract, the Public Works Director shall determine which shall prevail.

"Design Documents" – shall mean the construction plans and specifications included as part of a Bid/Proposal Solicitation prepared either by the City or by the Consultant under a separate Agreement with the City.

"Engineer" - shall mean the Public Works Director or his/her designee.

"Extra Work" - shall mean work other than that required by the Contract.

"Inspector" – shall mean an authorized representative of the City assigned to make necessary inspections of materials furnished by Contractor and of the Work performed by Contractor.

"Notice" - shall mean written notice sent by certified United States Mail, return receipt requested, or sent by commercial express carrier with acknowledgement of delivery, or via fax or email, or by hand delivery with a request for a written receipt of acknowledgment of delivery and shall be served upon the Contractor either personally or to its place of business listed in the Bid.

"Owner" - shall mean the City of Fort Lauderdale.

"Project Manager" - shall mean the Public Works Director or his/her designee.

"Public Works Director" - shall mean the Public Works Director of the City of Fort Lauderdale, Florida or his/her designee(s).

"Site" - shall mean the area upon or in which the Contractor's operations are carried out and such other areas adjacent thereto as may be designated as such by the Public Works Director.

"Subcontractor" - shall mean any person, firm, company, corporation or other entity, other than employees of the Contractor, who or which contracts with the contractor, to furnish, or actually furnishes labor and materials, or labor and equipment, or labor, materials and equipment at the site.

"Surety" - shall mean any corporation or entity that executes, as Surety, the Contractor's performance and payment bond securing the performance of this Contract.

**GC – 02 - SITE INVESTIGATION AND REPRESENTATION** - The Contractor acknowledges that it has satisfied itself as to the nature and location of the Work under the Contract Documents, the general and local conditions of the Site, particularly those bearing upon availability of transportation, disposal, handling and storage of materials, availability of labor, water, electric power, and roads, the conformation and conditions at the ground based on City provided reports, the type of equipment and facilities needed preliminary to and during the prosecution of the Work and all other matters which can in any way affect the Work or the cost thereof under the Contract Documents.

The Contractor acknowledges that it has conducted extensive tests, examinations and investigations and represents and warrants a thorough familiarization with the nature and extent of the Contract Documents, the Work, locality, soil conditions, moisture conditions and all year-round local weather and climate conditions (past and present), and, in reliance on such tests, examination and investigations conducted by Contractor and the Contractor's experts, has determined that no conditions exist that would in any manner affect the Bid Price and that the project can be completed for the Bid Price submitted.

The Contractor, on its own, has made or caused to be made examinations, investigations, tests and studies of reports and related data in addition to those referred above, as Contractor deemed necessary to perform the Work at the Bid price set by the Contractor, within the contract time and in accordance with the other terms and conditions of the Contract Documents and the Bid made by the Contractor; and no additional examinations, investigations, tests, reports or similar data are, or will be, required by Contractor to assure that the Work can be done at the Bid price set by the Contractor.

The Contractor further acknowledges that it has satisfied itself based on any geotechnical reports the City may provide and inspection of the project Site as to the character, quality, and quantity of surface and subsurface materials to be encountered from inspecting the site and from evaluating information derived from exploratory work that may have been done by the City or included in the Contract Documents and finds and has further determined that no conditions exist that would in any manner affect the Bid price and that the project can be completed for the Bid price submitted.

Any failure by the Contractor to acquaint itself with all the provided information and information obtained by visiting the project Site will not relieve Contractor from responsibility for properly estimating the difficulty or cost thereof under the Contract Documents. In the event that the actual subsurface conditions vary from the actual City provided reports, the Contractor shall notify the City and the Contract amount may be adjusted depending on the conditions, at the approval of the City.

**GC – 03 - SUBSTITUTIONS** - If the Contractor desires to use materials and/or products of manufacturer's names different from those specified in the Contract Documents, the Bidder requesting the substitution shall make written application as described herein. The burden of proving the equality of the proposed substitution rests on the Bidder making the request. To be acceptable, the proposed substitution shall meet or exceed all expressed requirements of the Contract Documents and shall be submitted upon the Contractor's letterhead, in addition to the "Contractor's Request for Substitution" form provided by the Public Works Director. The following requirements shall be met in order for the substitution to be considered:

1. Requests for substitution shall reach the Public Works Director no less than ten (10) Working Days prior to the date set for opening of Bids; and
2. Requests for substitution shall be accompanied by such technical data, as the party making the request desires to submit. The Public Works Director will consider reports from reputable independent testing laboratories, verified experience records from previous users and other written information valid in the circumstances; and
3. Requests for substitution shall completely and clearly indicate in what respects the materials and/or products differ from those indicated in the Contract Documents; and
4. Requests for substitution shall be accompanied by the manufacturer's printed recommendations clearly describing the installation, use and care, as applicable, of the proposed substitutions; and
5. Requests for substitution shall be accompanied by a complete schedule of changes in the Contract Documents, if any, which must be made to permit the use of the proposed substitution.

If a proposed substitution is approved by the Public Works Director, an Addendum will be issued to prospective bidders not less than three (3) working days prior to the date set for opening of Bids. Unless substitutions are received and approved as described above, the successful Bidder shall be responsible for furnishing materials and products in strict accordance with the Contract Documents.

**GC – 04 - CONTROL OF THE WORK** - The Public Works Director shall have full control and direction of the Work in all respects. The Public Works Director and/or his authorized designee(s) shall, at all times, have the right to inspect the Work and materials. The Contractor shall furnish all reasonable facilities for obtaining such information, as the Public Works Director may desire respecting the quality of the Work and materials and the manner of conducting the Work. Should the Contractor be directed or permitted to perform night Work, or to vary the period which work is ordinarily carried on in the daytime, he shall give ample notice to the Public Works Director so that proper and adequate inspection may be provided. Such Work shall be done only under such regulations as are furnished in writing by the Public Works Director, and no extra compensation shall be allowed to the Contractor therefore. In the event of night work, the Contractor shall furnish such light, satisfactory to the Public Works Director, as will insure proper inspection. Nothing herein contained shall relieve the Contractor from compliance with any and all City ordinances relating to noise or Work during prohibited hours.

The Contractor shall keep the Public Works Director informed, a reasonable time in advance, as to his need for grades and lines in order that the same may be furnished and all necessary measurements made for records and for payment with the minimum of inconvenience to the Public Works Director or of delay to the Contractor. The Contractor shall submit to the Public Works Director or Inspector on the job a written request outlining the streets, etc., for which the Contractor desires lines and grades. It is the intention not to delay the Work for the giving of lines and grades, but when necessary, work operations shall be suspended for such reasonable time as the Public Works Director may require for this purpose. However, such cost increases shall be authorized either by the City Manager and/or designee, or the City Commission based upon the purchasing threshold amounts provided for in Chapter 2 of the City of Fort Lauderdale's Code of Ordinances.

**GC – 05 - SUBCONTRACTOR** - The Contractor shall not sublet, in whole or any part of the Work without the written consent and approval of the Public Works Director. Within ten (10) days after official notification of starting date, the Contractor must submit in writing, to the Public Works Director, a list of all Subcontractors. No Work shall be done by any Subcontractor until such Subcontractor has been officially approved by the Public Works Director. A subcontractor not appearing on the original list will not be approved without written request submitted to the Public Works Director and approved by the Public Works Director. In all cases, the Contractor shall give his personal attention to the Work of the Subcontractors and the Subcontractor is liable to be discharged by the Contractor, at the direction of the Public Works Director, for neglect of duty, incompetence or misconduct.

Acceptance of any Subcontractor, other person, or organization by the Public Works Director shall not constitute a waiver of any right of Public Works Director to reject defective Work or Work not in conformance with the Contract Documents.

Contractor shall be fully responsible for all acts and omissions of his Subcontractors and of persons and organizations directly or indirectly employed by them and of persons and organizations for whose acts any of them may be liable to the same extent that he is responsible for the acts and omissions of persons directly employed by him. Nothing in the Contract Documents shall create any contractual relationship between City and any Subcontractor or other person or organization having a direct contract with Contractor, nor shall it create any obligation on the part of City to pay or to see to the payment of any moneys due to any Subcontractor or other person, or organization, except as may otherwise be required by law.

**GC – 06 - QUANTITIES** - It is mutually agreed that the proposal shows the approximate amounts only along with the Plans and the general location. It is also mutually agreed that no change will be made involving any departure from the general scheme of the Work and that no such change involving a material change in cost, either to the City or Contractor, shall be made, except upon written permission of the City. However, the Public Works Director shall have the right to make minor alternations in the line, grade, plan, form or materials of the Work herein contemplated any time before the completion of the same. That if such alterations shall diminish the quantity of the Work to be done, such alterations shall not constitute a claim for damages or anticipated profits. That if such alterations increase the amount of the Work to be done, such increase shall be paid for according to the quantity actually performed and at the unit price or prices stipulated therefore in the Contract.

The City shall, in all cases of dispute, determine the amount or quantity of the several kinds of Work which are to be paid for under this Contract, and shall decide all questions relative to the execution of the same, and such estimates and decisions shall be final and binding.

Any Work not herein specified, which might be fairly implied as included in the Contract, of which the City shall judge, shall be done by the Contractor without extra charge. However, such cost increases shall be authorized either by the City Manager and/or designee, or the City Commission

based upon the purchasing threshold amounts provided for in Chapter 2 of the City of Fort Lauderdale's Code of Ordinances.

**GC-07 - NO ORAL CHANGES** - Except to the extent expressly set forth in the Contract, no change in or modification, termination or discharge of the Contract in any form whatsoever, shall be valid or enforceable unless it is in writing and signed by the parties charged, therewith or their duly authorized representative.

**GC - 08 - PERMITS AND PROTECTION OF PUBLIC** – Permits on file with the City and or those permits to be obtained shall be considered directive in nature and will be considered a part of this Contract. A copy of all permits shall be given to the City and become part of the Contract Documents. Terms of permits shall be met prior to acceptance of the Work and release of the final payment.

The Contractor shall be required to observe all the ordinances in relation to obtaining permits for occupying, excavating, or in any way obstructing the streets and alleys. He shall erect and maintain barricades and sufficient safeguards around all excavations, embankments or obstructions; he shall place sufficient warning lights at or near the Work; keep the same burning from sunset to sunrise, employ watchmen, and strictly obey all laws and ordinances controlling or limiting those engaged in similar work.

Where there are telephones, light or power poles, water mains, conduits, pipes or drains or other construction, either public or private, in or on the streets or alleys, the Work shall be so conducted that no interruption or delay will be caused in the operation or use of the same. Proper written notice shall be given, and all the facilities, afforded the owners of such construction encountered or likely to be encountered, as will enable them to preserve the same from injury.

The Contractor shall not be permitted to interfere with public travel and convenience by grading or tearing up streets indiscriminately, but the Work of constructing the various items in this contract shall proceed in an orderly, systematic and progressive manner.

Contractor shall not load nor permit any part of any structure to be loaded with weights that will endanger the structure, nor shall he subject any part of the Work to stresses or pressures that will endanger it.

Where lifting operations involving the use of specialized cranes are required as part of construction, Contractor must make undertake the following investigation and submit the results and documentation to the Engineer prior to commencing any lifting operations: marking a very specific area in the field for the placement of the crane; a drawing showing the limitations of the job operation (i.e. not over adjacent properties or pedestrian and high vehicular traffic areas); underground utility exploration in the vicinity of the crane location, which may include ground penetrating radar to identify voids or old pipe or other subsurface features that could lead to sudden failure; assessment of the underlying soil and roadway materials and a worst case analysis based on entire load being distributed on just one or two outriggers; provision of properly sized pads under the outriggers; loading charts from manufacturer showing allowable configurations/loads; and inspection to make sure crane operation is in accordance with the permit conditions.

**GC - 09 - DISEASE REGULATIONS** - The Contractor shall enforce all sanitary regulations and take all precautions against infectious diseases as the Public Works Director may deem necessary. Should any infectious or contagious diseases occur among his employees, he shall arrange for the immediate removal of the employee from the Site and isolation of all persons connected with the Work.

**GC - 10 - CONTRACTOR TO CHECK PLANS, SPECIFICATIONS, AND DATA** - The Contractor shall verify all dimensions, quantities, and details shown on the plans, supplementary drawings, schedules, or other data received from the Public Works Director, and shall notify the Public Works Director of all errors, omissions, conflicts and discrepancies found therein within three (3) working days of discovery. Failure to discover or correct errors, conflicts, or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory Work, faulty construction, or improper operation resulting there from nor from rectifying such condition at his own expense.

**GC - 11 - SUPPLEMENTARY DRAWINGS** - When, in the opinion of the Public Works Director, it becomes necessary to explain more fully the Work to be done, or to illustrate the work further, or to show any changes which may be required, drawings, known as supplementary drawings, with specifications pertaining thereto, will be prepared by the Public Works Director and copies will be given to the Contractor.

The supplementary drawings shall be binding upon the Contractor with the same force as the original Plans. Where such supplementary drawings require either less or more than the estimated quantities of work, credit to the City or compensations therefore to the Contractor shall be subject to the terms of the Contract.

**GC - 12 - MATERIALS AND WORKMANSHIP** - All material and workmanship shall, in every respect, be in conformity with approved modern practice and with prevailing standards of performance and quality. In the event of dispute the Public Works Director's decision shall be final. Wherever the Plans, specifications, Contract Documents, or the directions of the Public Works Director are unclear as to what is permissible and/or fail to note the quality of any Work, that interpretation will be made by the Public Works Director, which is in accordance with approved modern practice, to meet the particular requirements of the Contract.

In all cases, new materials shall be used, unless this provision is waived by notice from the City in writing.

**GC - 13 - SAFEGUARDING MARKS** - The Contractor shall safeguard all points, stakes, grade marks, monuments, and bench marks made or established on the Work, bear the cost of re-establishing same if disturbed, or bear the entire expense of rectifying Work improperly installed due to not maintaining or protecting or for removing without authorization, such established points, stakes and marks. The Contractor shall safeguard all existing and known property corners, monuments and marks not related to the Work and, if required, shall bear the cost of having them re-established by a licensed surveyor if disturbed or destroyed during the course of construction.

**GC - 14 - EXISTING UTILITY SERVICE** - All existing utility service shall be maintained with a minimum of interruption at the expense of the Contractor.

**GC - 15 - JOB DESCRIPTION SIGNS** – Contractor, at Contractor's expense, shall furnish, erect, and maintain suitable weatherproof signs on jobs over \$100,000 containing the following information:

1. City Seal (in colors)
2. Project or Improvement Number
3. Job Description
4. Estimated Cost
5. Completion Date

Minimum size of sign shall be four feet high, eight feet wide and shall be suitably anchored. The entire sign shall be painted and present a pleasing appearance. Exact location of signs will be determined in the field. Two (2) signs will be required, one at each end of the job. All costs of this work shall be included in other parts of the work.

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**GC - 16 - FLORIDA EAST COAST RIGHT-OF-WAY** - Whenever a City contractor is constructing within the Florida East Coast Railway Company's Right-of-Way, it will be mandatory that the contractor carry separate bodily injury and property damage insurance in the amounts as stated below. This insurance shall be taken out and maintained during the life of the Contract.

Bodily injury insurance in an amount not less than \$500,000.00 for injuries, including wrongful death to any one person, and subject to the same limit for each person, in an amount not less than \$1,000,000.00 on account of any one occurrence, and

Property damage insurance in an amount not less than \$500,000.00 for damages on account of any one occurrence and in an amount not less than \$1,000,000.00 for damages on account of all occurrences.

**GC - 17 - ACCIDENTS** - The Contractor shall provide such equipment and facilities as are necessary and/or required, in the case of accidents, for first aide services to be provided to a person who may be injured during the project duration. The Contractor shall also comply with the OSHA requirements as defined in the United States Labor Code 29 CFR 1926.50.

In addition, the Contractor must report immediately to the Public Works Director every accident to persons or damage to property, and shall furnish in writing full information, including testimony of witnesses regarding any and all accidents.

**GC - 18 - SAFETY PRECAUTIONS** - Contractor must adhere to the applicable environmental protection guidelines for the duration of a project. If hazardous waste materials are used, detected or generated at any time, the Project Manager must be immediately notified of each and every occurrence. The Contractor shall comply with all codes, ordinances, rules, orders and other legal requirements of public authorities (including OSHA, EPA, DERM, the City, Broward County, State of Florida, and Florida Building Code), which bear on the performance of the Work.

The Contractor shall take the responsibility to ensure that all Work is performed using adequate safeguards, including but not limited to: proper safe rigging, safety nets, fencing, scaffolding, barricades, chain link fencing, railings, barricades, steel plates, safety lights, and ladders that are necessary for the protection of its employees, as well as the public and City employees. All riggings and scaffolding shall be constructed with good sound materials, of adequate dimensions for their intended use, and substantially braced, tied or secured to ensure absolute safety for those required to use it, as well as those in the vicinity. All riggings, scaffolding, platforms, equipment guards, trenching, shoring, ladders and similar actions or equipment shall be OSHA approved, as applicable, and in accordance with all Federal, State and local regulations.

**GC - 19 - DUST PREVENTION** - The Contractor shall, by means of a water spray, or temporary asphalt pavement, take all necessary precautions to prevent or abate a dust nuisance arising from dry weather or Work in an incomplete stage. All costs of this Work shall be included in cost of other parts of the Work.

Should the Contractor fail to abate a dust nuisance by the above methods, and then he will be required to immediately construct temporary patches per City standards.

**GC - 20 - PLACING BARRICADES AND WARNING LIGHTS** - The Contractor shall furnish and place, at his own expense, all barricades, warning lights, automatic blinker lights and such devices necessary to properly protect the work and vehicular and pedestrian traffic. Should the Contractor fail to erect or maintain such barricades, warning lights, etc., the Public Works Director may, after 24 hours' notice to the Contractor, proceed to have such barricades and warning lights placed and maintained by City or other forces and all costs incurred thereof charged to the Contractor and may be retained by the City from any monies due, or to become due, to the Contractor.

**GC - 21 - TRAFFIC CONTROL** - The Contractor shall coordinate all Work and obtain, through the Engineering Department, any permits required to detour traffic or close any street before starting to work in the road. The following section: Part VI Traffic Controls for Street and Highway Construction and Maintenance Operations, MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, U.S. Department of Transportation Federal Highway Administration, 2009, or current edition, shall be used as a guide for requirement and placement of traffic control devices, signs and barricades. The Public Works Director shall determine requirements for the above. The above publication is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. In the event that a Maintenance of Traffic (MOT) Plan is required, the Plan shall be prepared by an A.A.S.T.A. certified technician.

All traffic control devices, flashing lights, signs and barricades shall be maintained in working condition at all times.

**GC - 22 - COORDINATION** - The Contractor shall notify all utilities, transportation department, etc., in writing, with a copy to the Public Works Director before construction is started and shall coordinate his Work with them. The Contractor shall cooperate with the owners of any underground or overhead utility lines in their removal, construction and rearrangement operations in order that services rendered by these parties will not be unnecessarily interrupted.

The Contractor shall arrange his Work and dispose of his materials so as to not interfere with the operation of other Contractors engaged upon adjacent work and to join his Work to that of others in a proper manner and to perform his Work in the proper sequence in relation to that of other Contractors all as may be directed by the Public Works Director.

Each Contractor shall be responsible for any damage done by him or his agents to the work performed by another Contractor.

The Contractor shall contact the Broward County Transportation Department and the Florida Department of Transportation, as applicable, to verify and obtain location of any and all traffic conduits, loops, and street light underground services.

**GC - 23 - WATER** - Bulk water used for construction, flushing pipelines, and testing shall be obtained from fire hydrants. Contractor shall make payment for hydrant meter at Treasury Billing Office, 1st Floor, City Hall, 100 N. Andrews Avenue. With the paid receipt, contractor can pick up hydrant meter at the utility location office. No connection shall be made to a fire hydrant without a meter connected.

**GC - 24 - PROHIBITION AGAINST CONTRACTING WITH SCRUTINIZED COMPANIES** - Subject to *Odebrecht Construction, Inc., v. Prasad*, 876 F.Supp.2d 1305 (S.D. Fla. 2012), *affirmed*, *Odebrecht Construction, Inc., v. Secretary, Florida Department of Transportation*, 715 F.3d 1268 (11th Cir. 2013), with regard to the "Cuba Amendment," the Contractor certifies that it is not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2016), that it is not engaged in a boycott of Israel, and that it does not have business operations in Cuba or Syria, as provided in section 287.135, Florida Statutes (2016), as may be amended or revised. The City may terminate this Agreement at the City's option if the Contractor is found to have submitted a false certification as provided under subsection (5) of section 287.135, Florida Statutes (2016), as may be amended or revised, or been placed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2016), or is engaged in a boycott of Israel or has been engaged in business operations in Cuba or Syria, as defined in Section 287.135, Florida Statutes (2016), as may be amended or revised.

**GC - 25 - LOCATION OF UNDERGROUND FACILITIES** - If the Proposer, for the purpose of responding to this solicitation, requests the location of underground facilities through the Sunshine State One-Call of Florida, Inc. notification system or through any person or entity providing a facility locating service, and underground facilities are marked with paint, stakes or other markings within the City pursuant to such a request, then the Proposer shall be deemed non-responsive to this solicitation in accordance with Section 2-184(5) of the City of Fort Lauderdale Code of Ordinances.

**GC - 26 – USE OF FLORIDA LUMBER TIMBER AND OTHER FOREST PRODUCTS** - In accordance with Florida Statute 255.20 (3), The City specifies that lumber, timber, and other forest products used for this project shall be produced and manufactured in the state of Florida if such products are available and their price, fitness, and quality are equal. This requirement does not apply to plywood specified for monolithic concrete forms, if the structural or service requirements for timber for a particular job cannot be supplied by native species, or if the construction is financed in whole or in part from federal funds with the requirement that there be no restrictions as to species or place of manufacture.

The Bidder affirms by submitting a bid response to this solicitation that they will comply with section 255.20 (3) Florida Statutes.

**GC – 27 – PUBLIC RECORDS/TRADE SECRETS/COPYRIGHT:** The Proposer's response to the Solicitation is a public record pursuant to Florida law, which is subject to disclosure by the City under the State of Florida Public Records Law, Florida Statutes Chapter 119.07 ("Public Records Law"). The City shall permit public access to all documents, papers, letters or other material submitted in connection with this Solicitation and the Contract to be executed for this Solicitation, subject to the provisions of Chapter 119.07 of the Florida Statutes.

Any language contained in the Proposer's response to the Solicitation purporting to require confidentiality of any portion of the Proposer's response to the Solicitation, except to the extent that certain information is in the City's opinion a Trade Secret pursuant to Florida law, shall be void. If a Proposer submits any documents or other information to the City which the Proposer claims is Trade Secret information and exempt from Florida Statutes Chapter 119.07 ("Public Records Laws"), the Proposer shall clearly designate that it is a Trade Secret and that it is asserting that the document or information is exempt. The Proposer must specifically identify the exemption being claimed under Florida Statutes 119.07. The City shall be the final arbiter of whether any information contained in the Proposer's response to the Solicitation constitutes a Trade Secret. The City's determination of whether an exemption applies shall be final, and the proposer agrees to defend, indemnify, and hold harmless the City and the City's officers, employees, and agent, against any loss or damages incurred by any person or entity as a result of the City's treatment of records as public records. Proposals purporting to be subject to copyright protection in full or in part will be rejected.

**EXCEPT FOR CLEARLY MARKED PORTIONS THAT ARE BONA FIDE TRADE SECRETS PURSUANT TO FLORIDA LAW, DO NOT MARK YOUR RESPONSE TO THE SOLICITATION AS PROPRIETARY OR CONFIDENTIAL. DO NOT MARK YOUR RESPONSE TO THE SOLICITATION OR ANY PART THEREOF AS COPYRIGHTED.**

**IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:**

**Telephone Number:** (954) 828-5002

**Mailing Address:** City Clerk's Office  
100 N. Andrews Avenue  
Fort Lauderdale, FL 33301

**E-mail:** [prcontract@fortlauderdale.gov](mailto:prcontract@fortlauderdale.gov)

Contractor shall:

1. Keep and maintain public records that ordinarily and necessarily would be required by the City in order to perform the service.
2. Upon request from the City's custodian of public records, provide the City with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes (2016), as may be amended or revised, or as otherwise provided by law.
3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of this contract if the Contractor does not transfer the records to the City.
4. Upon completion of the Contract, transfer, at no cost, to the City all public records in possession of the Contractor or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City upon completion of this Contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of this Contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the information technology systems of the City.

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**SECTION 01 11 00  
SUMMARY OF WORK**

**PART 1 GENERAL**

**1.01 WORK COVERED BY CONTRACT DOCUMENTS**

- A. The completed Work will provide Owner with replacement of three sodium hypochlorite FRP storage tanks, one sodium hypochlorite FRP day tank, piping and valve replacement, replacement of degasifier media, and an in-situ cleaning system for the two existing degasifiers and includes removal of a CMU wall, installation of a bi-fold steel door and associated electrical, piping, in-plant gravity sewer extension, HVAC modifications, painting, and miscellaneous electrical and pipe relocations.
- B. Alternates:
1. Only those alternates that were selected by the Owner, as evidenced in the Agreement, are made a part of this Contract.
  2. Alternates that were Bid were as described below:
    - a. Additive Alternate No. 1-Compressed tank submittal and manufacturing schedule.
    - b. Additive Alternate No. 2-Ten year and 20 year warranty for all the FRP tanks.

**1.02 NSF COMPLIANCE**

- A. All materials components and chemicals coming in contact with the water in the treatment process shall be NSF approved or Food Grade.

**1.03 DANGEROUS CHEMICALS ON SITE**

- A. The location of the work is an active water treatment plant and several dangerous chemicals are stored and used on site. The contractor's on-site staff must be able to read, speak and understand English or otherwise be trained and responsible for awareness of the dangerous chemicals on site and be prepared to deal with a potential emergency.

**1.04 WORK NOT COVERED BY CONTRACT DOCUMENTS**

- A. None.

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**PART 2      PRODUCTS (NOT USED)**

**PART 3      EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01 26 00  
CONTRACT MODIFICATION PROCEDURES****PART 1 GENERAL****1.01 PROPOSAL REQUESTS**

- A. Owner may, in anticipation of ordering an addition, deletion, or revision to the Work, request Contractor to prepare a detailed proposal of cost and times to perform contemplated change.
- B. Proposal request will include reference number for tracking purposes and detailed description of and reason for proposed change, and such additional information as appropriate and as may be required for Contractor to accurately estimate cost and time impact on Project.
- C. Proposal request is for information only; Contractor is neither authorized to execute proposed change nor to stop Work in progress as result of such request.
- D. Contractor's written proposal shall be transmitted to Engineer promptly, but not later than 14 calendar days after Contractor's receipt of Owner's written request. Proposal shall remain firm for a maximum period of 45 calendar days after receipt by Engineer.
- E. Owner's request for proposal or Contractor's failure to submit such proposal within the required time period will not justify a Claim for an adjustment in Contract Price or Contract Times (or Milestones).

**1.02 CLAIMS**

- A. Include, at a minimum:
  - 1. Specific references including (i) Drawing numbers, (ii) Specification section and article/paragraph number, and (iii) Submittal type, Submittal number, date reviewed, Engineer's comment, as applicable, with appropriate attachments.
  - 2. Stipulated facts and pertinent documents, including photographs and statements.
  - 3. Interpretations relied upon.
  - 4. Description of (i) nature and extent of Claim, (ii) who or what caused the situation, (iii) impact to the Work and work of others, and (iv) discussion of claimant's justification for requesting a change to price or times or both.
  - 5. Estimated adjustment in price claimant believes it is entitled to with full documentation and justification.
  - 6. Requested Change in Contract Times: Include at least (i) Progress Schedule documentation showing logic diagram for request, (ii) documentation that float times available for Work have been used, and (iii) revised activity

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logic with durations including sub-network logic revisions, duration changes, and other interrelated schedule impacts, as appropriate.

7. Documentation as may be necessary as set forth below for Work Change Directive, and as Engineer may otherwise require.

### 1.03 WORK CHANGE DIRECTIVES

#### A. Procedures:

1. Engineer will:
  - a. Initiate, including a description of the Work involved and any attachments.
  - b. Affix signature, demonstrating Engineer's recommendation.
  - c. Transmit three copies to Owner for authorization.
2. Owner will:
  - a. Affix signature, demonstrating approval of the changes involved.
  - b. Return one scanned copy to Engineer, who will retain for filing, send to the Resident Project Representative or other field representative, and forward to Contractor.
3. Upon completion of Work covered by the Work Change Directive or when final Contract Times and Contract Price are determined, Contractor shall submit documentation for inclusion in a Change Order.
4. Contractor's documentation shall include but not be limited to:
  - a. Appropriately detailed records of Work performed to enable determination of value of the Work.
  - b. Full information required to substantiate resulting change in Contract Times and Contract Price for Work. On request of Engineer, provide additional data necessary to support documentation.
  - c. Support data for Work performed on a unit price or Cost of the Work basis with additional information such as:
    - 1) Dates Work was performed, and by whom.
    - 2) Time records, wage rates paid, and equipment rental rates.
    - 3) Invoices and receipts for materials, equipment, and subcontracts, all similarly documented.

- B. Effective Date of Work Change Directive: Date of signature by Owner, unless otherwise indicated thereon.

### 1.04 CHANGE ORDERS

#### A. Procedure:

1. Engineer will prepare three copies of proposed Change Order and transmit such with Engineer's written recommendation and request to Contractor for signature.
2. Contractor shall, upon receipt, either: (i) promptly sign copies, scanning one for its file, and return all to Engineer for Owner's signature, or (ii) return

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unsigned three copies with written justification for not executing Change Order.

3. Engineer will, upon receipt of Contractor signed copies, promptly forward Engineer's written recommendation and partially executed three copies for Owner's signature, or if Contractor fails to execute the Change Order, Engineer will promptly so notify Owner and transmit Contractor's justification to Owner.
4. Upon receipt of Contractor-executed Change Order, Owner will promptly either:
  - a. Execute Change Order, retaining one copy for its file and returning scanned copy to Engineer; or
  - b. Return to Engineer unsigned copies with written justification for not executing Change Order.
5. Upon receipt of Owner-executed Change Order, Engineer will transmit a scanned copy to Contractor, to Resident Project Representative or other field representative, and retain for filing, or if Owner fails to execute the Change Order, Engineer will promptly so notify Contractor and transmit Owner's justification to Contractor.
6. Upon receipt of Owner-executed Change Order, Contractor shall:
  - a. Perform Work covered by Change Order.
  - b. Revise Schedule of Values to adjust Contract Price and submit with next Application for Payment.
  - c. Revise Progress Schedule to reflect changes in Contract Times, if any, and to adjust times for other items of Work affected by change.
  - d. Enter changes in Project record documents after completion of change related Work.

B. In signing a Change Order, Owner and Contractor acknowledge and agree that:

1. Stipulated compensation (Contract Price or Contract Times, or both) set forth includes payment for (i) the Cost of the Work covered by the Change Order, (ii) Contractor's fee for overhead and profit, (iii) interruption of Progress Schedule, (iv) delay and impact, including cumulative impact, on other Work under the Contract Documents, and (v) extended overheads.
2. Change Order constitutes full mutual accord and satisfaction for the change to the Work.
3. Unless otherwise stated in the Change Order, all requirements of the original Contract Documents apply to the Work covered by the Change Order.

#### 1.05 COST OF THE WORK

- A. In determining the supplemental costs allowed in Article 14.1.3 of the Contract for rental equipment and machinery, the following will apply.
- B. Rental of construction equipment and machinery and the parts thereof having a replacement value in excess of \$1,000, whether owned by Contractor or rented or leased from others, shall meet the following requirements:

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1. Full rental costs for leased equipment shall not exceed rates listed in the Rental Rate Blue Book published by Equipment Watch, as adjusted to the regional area of the Project. Owned equipment costs shall not exceed the single shift rates established in the Cost Reference Guide (CRG) published by Equipment Watch. The most recent published edition in effect at commencement of actual equipment use shall be used.
2. Rates shall apply to equipment in good working condition. Equipment not in good condition, or larger than required, may be rejected by Engineer or accepted at reduced rates.
3. Leased Equipment: For equipment leased or rented in arm's length transactions from outside vendors, maximum rates shall be determined by the following actual usage/Payment Category:
  - a. Less than 8 hours: Hourly rate.
  - b. 8 or more hours but less than 7 days: Daily rate.
  - c. 7 or more days but less than 30 days: Weekly rate.
  - d. 30 days or more: Monthly rate.
4. Arm's length rental and lease transactions are those in which the firm involved in the rental or lease of equipment is not associated with, owned by, have common management, directorship, facilities and/or stockholders with the firm renting the equipment.
5. Financial arrangements associated with rental and lease transactions that provide Contractor remuneration or discounts not visible to the Owner must be disclosed and integrated with charged rates.
6. Leased Equipment in Use: Actual equipment use time documented by Engineer shall be the basis that equipment was on and utilized at the Project Site. In addition to the leasing rate above, equipment operational costs shall be paid at the estimated hourly operating cost rate set forth in the Rental Rate Blue Book if not already included in the lease rate. Hours of operation shall be based upon actual equipment usage to the nearest quarter hour, as recorded by Engineer.

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7. Leased Equipment, When Idle (Standby): Idle or standby equipment is equipment onsite or in transit to and from the Work Site and necessary to perform the Work under the modification, but not in actual use. Idle equipment time, as documented by Engineer, shall be paid at the leasing rate determined above, excluding operational costs.
8. Owned and Other Equipment in Use: Equipment rates for owned equipment or equipment provided in other than arm's length transaction shall not exceed the single shift total hourly costs rate developed in accordance with the CRG and as modified herein for multiple shifts. This total hourly rate will be paid for each hour the equipment actually performs work. Hours of operation shall be based upon actual equipment usage as recorded by Engineer. This rate shall represent payment in full for Contractor's direct costs.
9. Owned and Other Equipment, When Idle (Standby): Equipment necessary to be onsite to perform the Work on single shift operations, but not utilized, shall be paid for at the ownership hourly expense rate developed in accordance with the CRG, provided its presence and necessity onsite has been documented by Engineer. Payment for idle time of portions of a normal workday, in conjunction with original contract Work, will not be allowed. In no event shall idle time claimed in a day for a particular piece of equipment exceed the normal Work or shift schedule established for the Project. It is agreed that this rate shall represent payment in full for Contractor's direct costs. When Engineer determines that the equipment is not needed to continuously remain at the Work Site, payment will be limited to actual hours in use.
10. Owned and Other Equipment, Multiple Shifts: For multiple shift operations, the CRG single shift total hourly costs rate shall apply to the operating equipment during the first shift. For subsequent shifts, up to two in a 24-hour day, operating rate shall be the sum of the total hourly CRG operating cost and 60 percent of the CRG ownership and overhaul expense. Payment for idle or standby time for second and third shifts shall be 20 percent of the CRG ownership and overhaul expense.
11. When necessary to obtain owned equipment from sources beyond the Project limits, the actual cost to transfer equipment to the Site and return it to its original location will be allowed as an additional item of expense. Move-in and move-out allowances will not be made for equipment brought to the Project if the equipment is also used on original Contract or related Work.
12. If the move-out destination is not to the original location, payment for move-out will not exceed payment for move-in.
13. If move is made by common carrier, the allowance will be the amount paid for the freight. If equipment is hauled with Contractor's own forces, rental will be allowed for the hauling unit plus the hauling unit operator's wage. If equipment is transferred under its own power, the rental will be 75 percent of the appropriate total hourly costs for the equipment, without attachments, plus the equipment operator's wage.
14. Charges for time utilized in servicing equipment to ready it for use prior to moving and similar charges will not be allowed.

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15. When a breakdown occurs on any piece of owned equipment, payment shall cease for that equipment and any other owned equipment idled by the breakdown.
16. If any part of the Work is shut down by Owner, standby time will be paid during nonoperating hours if diversion of equipment to other Work is not practicable. Engineer reserves the right to cease standby time payment when an extended shutdown is anticipated.
17. If a rate has not been established in the CRG for owned equipment, Contractor may:
  - a. If approved by Engineer, use the rate of the most similar model found, considering such characteristics as manufacturer, capacity, horsepower, age, and fuel type, or
  - b. Request Equipment Watch to furnish a written response for a rate on the equipment, which shall be presented to Engineer for approval; or
  - c. Request Engineer to establish a rate.

## 1.06 FIELD ORDER

- A. Engineer will issue Field Orders, with a scanned copy to Contractor.
- B. Effective date of the Field Order shall be the date of signature by Engineer, unless otherwise indicated thereon.
- C. Contractor shall acknowledge receipt by signing and returning one scanned copy to Engineer.
- D. Field Orders will be incorporated into subsequent Change Orders, as a no-cost change to the Contract.

**PART 2 PRODUCTS (NOT USED)****PART 3 EXECUTION (NOT USED)****END OF SECTION**

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**SECTION 01 29 00**  
**PAYMENT PROCEDURES**

**PART 1 GENERAL**

1.01 SUBMITTALS

A. Informational Submittals:

1. Schedule of Values: Submit on Owner's form.
2. Schedule of Estimated Progress Payments:
  - a. Submit with initially acceptable Schedule of Values.
  - b. Submit adjustments thereto with Application for Payment.
3. Application for Payment.
4. Final Application for Payment.

1.02 SCHEDULE OF VALUES

- A. Prepare a separate Schedule of Values for each schedule of the Work under the Agreement.
- B. Upon request of Engineer, provide documentation to support the accuracy of the Schedule of Values.
- C. Unit Price Work: Reflect unit price quantity and price breakdown from conformed Bid Form.
- D. Lump Sum Work:
  1. Reflect specified allowances and alternates, as applicable.
  2. List bonds and insurance premiums, mobilization, demobilization, preliminary and detailed progress schedule preparation, equipment testing, facility startup, and contract closeout separately.
    - a. Mobilization includes, at minimum, items identified in Section 01 50 00, Temporary Facilities and Controls.
    - b. Include item(s) for monthly progress schedule update.
- E. An unbalanced or front-end loaded schedule will not be acceptable.
- F. Summation of the complete Schedule of Values representing all the Work shall equal the Contract Price.

1.03 SCHEDULE OF ESTIMATED PROGRESS PAYMENTS

- A. Show estimated payment requests throughout Contract Times aggregating initial Contract Price.

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- B. Base estimated progress payments on initially acceptable progress schedule. Adjust to reflect subsequent adjustments in progress schedule and Contract Price as reflected by modifications to the Contract Documents.

1.04 APPLICATION FOR PAYMENT

- A. Transmittal Summary Form: Attach one Summary Form with each detailed Application for Payment for each schedule and include Request for Payment of Materials and Equipment on Hand as applicable. Execute certification by authorized officer of Contractor.
- B. Use detailed Application for Payment Form provided by Owner.
- C. Provide separate form for each schedule as applicable.
- D. Include accepted Schedule of Values for each schedule or portion of lump sum Work and the unit price breakdown for the Work to be paid on a unit priced basis.
- E. Include separate line item for each Change Order and Work Change Directive executed prior to date of submission. Provide further breakdown of such as requested by Engineer.
- F. Preparation:
  - 1. Round values to nearest dollar.
  - 2. Submit Application for Payment, including a Transmittal Summary Form and detailed Application for Payment Form(s) for each schedule as applicable, a listing of materials on hand for each schedule as applicable, and such supporting data as may be requested by Engineer.

1.05 PAYMENT

- A. Payment for all Lump Sum Work shown or specified in Contract Documents is included in the Contract Price. Payment will be based on a percentage complete basis for each line item of the accepted Schedule of Values.
- B. Payment for unit price items covers all the labor, materials, and services necessary to furnish and install the following items.

1.06 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

- A. Payment will not be made for following:
  - 1. Loading, hauling, and disposing of rejected material.
  - 2. Quantities of material wasted or disposed of in manner not called for under Contract Documents.

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3. Rejected loads of material, including material rejected after it has been placed by reason of failure of Contractor to conform to provisions of Contract Documents.
4. Material not unloaded from transporting vehicle.
5. Defective Work not accepted by Owner.
6. Material remaining on hand after completion of Work.

1.07 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

- A. Partial Payment: No partial payments will be made for materials and equipment delivered or stored unless Shop Drawings and preliminary operation and maintenance data is acceptable to Engineer.
- B. Final Payment: Will be made only for products incorporated in Work; remaining products, for which partial payments have been made, shall revert to Contractor unless otherwise agreed, and partial payments made for those items will be deducted from final payment.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01 31 13**  
**PROJECT COORDINATION**

**PART 1 GENERAL**

1.01 SUBMITTALS

A. Informational:

1. Photographs:

- a. Digital Images: Submit two copies of DVD disc or USB flash drive containing images within 10 days of being taken. Each image is to have a minimum file size of 1.4 Mb (1,400 Kb) so viewed resolution is high quality. The production of larger file sizes with higher resolution is encouraged.

1.02 RELATED WORK AT SITE

A. General:

1. Other work that is either directly or indirectly related to scheduled performance of the Work under these Contract Documents, listed henceforth, is anticipated to be performed at Site by others.
2. Coordinate the Work of these Contract Documents with work of others as specified in General Conditions.
3. Include sequencing constraints specified herein as a part of Progress Schedule.

1.03 FACILITY OPERATIONS

- A. Continuous operation of Owner's facilities is of critical importance. Schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified.
- B. Perform Work continuously during critical connections and changeovers, and as required to prevent interruption of Owner's operations.
- C. When necessary, plan, design, and provide various temporary services, utilities, connections, temporary piping and heating, access, and similar items to maintain continuous operations of Owner's facility.
- D. Do not close lines, open or close valves, or take other action which would affect the operation of existing systems. Owner will be responsible for operation of all valves.

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- E. A preliminary proposed schedule of construction shall be submitted for review and approval. The following steps and sequence shall be addressed in the schedule, and revised as necessary, that will allow for Owner's continuous occupancy and for uninterrupted operation during construction.
1. .
  2. Relocate the interior utilities necessary to remove the CMU wall for tank replacement.
  3. Remove the CMU wall, the middle storage tank and either the west storage tank or the east storage tank and day tank
  4. Prepare and recoat the containment area floor.
  5. Install the replacement tanks, piping supports as required, and valves.
  6. Install the bi-fold door with concrete apron.
  7. During the sodium hypochlorite tanks replacement, the Contractor can concurrently complete the following:
    - a. Removal of the degasifier media and cleaning of the tank. Only one degasifier can be off-line at a time.
    - b. Repair of the degasifier tank, if required.
    - c. Installation of in-situ cleaning system and connection to the degasifier tank that is off-line.
    - d. Installation of the new media into the degasifier.
    - e. Installation of the cleaning system drain line.
    - f. After the first degasifier is returned to service the second degasifier is removed from service.
    - g. Removal of the degasifier media and the tank is cleaned.
    - h. Repair of the degasifier tank, if required.
    - i. The in-situ cleaning system connections to the tank are installed.
    - j. Installation of the new media into the degasifier.
    - k. Place the final degasifier on-line.
- F. Process or Facility Shutdown:
1. The following shall require shutdown during the Work:
    - a. Connection of the temporary sodium hypochlorite storage tanks to the metering pumps.
  2. Provide 7 calendar days advance written request for approval of need to shut down a process or facility to Owner and Engineer.
  3. Power outages will be considered upon 48 hours written request to Owner and Engineer. Describe the reason, anticipated length of time, and areas affected by the outage. Provide temporary provisions for continuous power supply to critical facility components.
- G. Install and maintain bypass facilities and temporary connections required to keep Owner's Sodium Hypochlorite System and Degasifier System operations on line. Sequences other than those specified will be considered upon written request to Owner and Engineer, provided they afford equivalent continuity of operations.

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- H. Do not proceed with Work affecting a facility's operation without obtaining Owner's and Engineer's advance approval of the need for and duration of such Work.
- I. Relocation of Existing Facilities:
  - 1. During construction, it is expected that minor relocations of Work will be necessary.
  - 2. Provide complete relocation of existing structures and Underground Facilities, including piping, utilities, equipment, structures, electrical conduit wiring, electrical duct bank, and other necessary items.
  - 3. Use only new materials for relocated facility. Match materials of existing facility, unless otherwise shown or specified.
  - 4. Perform relocations to minimize downtime of existing facilities.
  - 5. Install new portions of existing facilities in their relocated position prior to removal of existing facilities, unless otherwise accepted by Engineer.

## 1.04 ADJACENT FACILITIES AND PROPERTIES

- A. Examination:
  - 1. After Effective Date of the Agreement and before Work at Site is started, Contractor, Engineer, and utility owners shall make a thorough examination of pre-existing conditions including existing buildings, structures, and other improvements in vicinity of Work, as applicable, which could be damaged by construction operations.
  - 2. Periodic reexamination shall be jointly performed to include, but not limited to, cracks in structures, settlement, leakage, and similar conditions.
- B. Documentation:
  - 1. Record and submit documentation of observations made on examination inspections in accordance with Article Construction Photographs.
  - 2. Such documentation shall be used as indisputable evidence in ascertaining whether and to what extent damage occurred as a result of Contractor's operations, and is for the protection of adjacent property owners, Contractor, and Owner.

## 1.05 CONSTRUCTION PHOTOGRAPHS

- A. General:
  - 1. Photographically document all phases of the Project including preconstruction, construction progress, and post-construction.
  - 2. Engineer shall have right to select subject matter and vantage point from which photographs are to be taken.

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3. Digital Images: No post-session electronic editing of images is allowed. Stored image shall be actual image as captured without cropping or other edits.

B. Preconstruction and Post-Construction:

1. After Effective Date of the Agreement and before Work at Site is started, and again upon issuance of Substantial Completion, take a minimum of 48 photographs of Site and property adjacent to perimeter of Site.
2. Particular emphasis shall be directed to structures both inside and outside the Site.
3. Format: Digital, minimum resolution of 1832 by 3264 pixels and 24-bit, millions of color.

C. Construction Progress Photos:

1. Photographically demonstrate progress of construction, showing every aspect of Site and adjacent properties as well as interior and exterior of new or impacted structures.
2. Weekly: Take photographs using digital, minimum resolution of 1832 by 3264 pixels and 24-bit, millions of color.
3. Monthly: Take 50 photographs using digital, minimum resolution of 1832 by 3264 pixels and 24-bit, millions of color.

D. Documentation:

1. Digital Images:
  - a. Electronic image shall have date taken embedded into image.
  - b. Label each disk with Project and Owner's name, and month and year images were produced.

1.06 AUDIO-VIDEO RECORDINGS

- A. Prior to beginning the Work on Site or of a particular area of the Work, and again within 10 working days following date of Substantial Completion, videograph Site and inside and outside of building.
- B. In the case of preconstruction recording, no work shall begin in the area prior to Engineer's review and approval of content and quality of video for that area.
- C. Particular emphasis shall be directed to physical condition of existing vegetation, structures, and pavements within pipeline alignment and areas adjacent to and within the right-of-way or easement, and on Contractor storage and staging areas.
- D. Engineer shall have right to select subject matter and vantage point from which videos are to be taken.

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E. Video Format and Quality:

1. DVD format, with sound.
2. Video:
  - a. Produce bright, sharp, and clear images with accurate colors, free of distortion and other forms of picture imperfections.
  - b. Electronically, and accurately display the month, day, year, and time of day of the recording.
3. Audio:
  - a. Audio documentation shall be done clearly, precisely, and at a moderate pace.
  - b. Indicate date, project name, and a brief description of the location of recording, including:
    - 1) Facility name.
    - 2) Street names or easements.
    - 3) Addresses of private property.
    - 4) Direction of coverage, including engineering stationing, if applicable.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION**

1.01 SALVAGE OF MATERIALS

- A. Materials to be salvaged include: None.

1.02 CUTTING, FITTING, AND PATCHING

- A. Cut, fit, adjust, or patch Work and work of others, including excavation and backfill as required, to make Work complete.
- B. Obtain prior written authorization of Engineer before commencing Work to cut or otherwise alter:
1. Structural or reinforcing steel, structural column or beam, elevated slab, trusses, or other structural member.
  2. Weather-resistant or moisture-resistant elements.
  3. Efficiency, maintenance, or safety of element.
  4. Work of others.
  5. Sodium hypochlorite system components.
- C. Refinish surfaces to provide an even finish.
1. Refinish continuous surfaces to nearest intersection.
  2. Refinish entire assemblies.

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3. Finish restored surfaces to such planes, shapes, and textures that no transition between existing work and the Work is evident in finished surfaces.
- D. Restore existing work, Underground Facilities, and surfaces that are to remain in completed Work including concrete-embedded piping, conduit, and other utilities as specified and as shown on Drawings.
- E. Make restorations with new materials and appropriate methods as specified for new Work of similar nature; if not specified, use recommended practice of manufacturer or appropriate trade association.
- F. Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces and fill voids.
- G. Remove specimens of installed Work for testing when requested by Engineer.

**END OF SECTION**

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**SECTION 01 31 19  
PROJECT MEETINGS****PART 1 GENERAL**

## 1.01 GENERAL

- A. Engineer will schedule physical arrangements for meetings throughout progress of the Work, prepare meeting agenda with regular participant input and distribute with written notice of each meeting, preside at meetings, record minutes to include significant proceedings and decisions, and reproduce and distribute copies of minutes within 7 days after each meeting to participants and parties affected by meeting decisions.

## 1.02 PRECONSTRUCTION CONFERENCE

- A. Contractor shall be prepared to discuss the following subjects, as a minimum:

1. Required schedules.
2. Status of Bonds and insurance.
3. Sequencing of critical path work items.
4. Progress payment procedures.
5. Project changes and clarification procedures.
6. Use of Site, access, office and storage areas, security and temporary facilities.
7. Major product delivery and priorities.
8. Contractor's safety plan and representative.

- B. Attendees will include:

1. Owner's representatives.
2. Contractor's office representative.
3. Contractor's resident superintendent.
4. Contractor's quality control representative.
5. Subcontractors' representatives whom Contractor may desire or Engineer may request to attend.
6. Engineer's representatives.
7. Others as appropriate.

## 1.03 PROGRESS MEETINGS

- A. Engineer will schedule regular progress meetings at Site, conducted monthly to review the Work progress, Progress Schedule, Schedule of Submittals, Application for Payment, contract modifications, and other matters needing discussion and resolution.

- B. Attendees will include:

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1. Owner's representative(s), as appropriate.
2. Contractor, Subcontractors, and Suppliers, as appropriate.
3. Engineer's representative(s).
4. Others as appropriate.

1.04 PREINSTALLATION MEETINGS

- A. When required in individual Specification sections, convene at Site prior to commencing the Work of that section.
- B. Require attendance of entities directly affecting, or affected by, the Work of that section.
- C. Notify Engineer 4 work days in advance of meeting date.
- D. Provide suggested agenda to Engineer to include reviewing conditions of installation, preparation and installation or application procedures, and coordination with related Work and work of others.

1.05 FACILITY STARTUP MEETINGS

- A. Schedule and attend a minimum of two facility startup meetings. The first of such meetings shall be held prior to submitting Facility Startup Plan, as specified in Section 01 91 14, Equipment Testing and Facility Startup, and shall include preliminary discussions regarding such plan.
- B. Agenda items shall include, but not be limited to, content of Facility Startup Plan, coordination needed between various parties in attendance, and potential problems associated with startup.
- C. Attendees will include:
  1. Contractor.
  2. Contractor's designated quality control representative.
  3. Subcontractors and equipment manufacturer's representatives whom Contractor deems to be directly involved in facility startup.
  4. Engineer's representatives.
  5. Owner's operations personnel.
  6. Others as required by Contract Documents or as deemed necessary by Contractor.

1.06 OTHER MEETINGS

- A. In accordance with Contract Documents and as may be required by Owner and Engineer.

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**PART 2      PRODUCTS (NOT USED)**

**PART 3      EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01 33 00**  
**SUBMITTAL PROCEDURES**

**PART 1 GENERAL**

1.01 DEFINITIONS

- A. Action Submittal: Written and graphic information submitted by Contractor that requires Engineer's approval.
- B. Informational Submittal: Information submitted by Contractor that requires Engineer's review and determination that submitted information is in accordance with the Conditions of the Contract.

1.02 PROCEDURES

- A. Direct submittals to Engineer at the following, unless specified otherwise.
  - 1. Available at preconstruction conference.
- B. Electronic Submittals: Submittals may be made in electronic format.
  - 1. Each submittal shall be an electronic file in Adobe Acrobat Portable Document Format (PDF) as well as native format. Use the latest version available at time of execution of the Agreement.
  - 2. Electronic files that contain more than 10 pages in PDF format shall contain internal bookmarking from an index page to major sections of the document.
  - 3. PDF files shall be set to open "Bookmarks and Page" view.
  - 4. Add general information to each PDF file, including title, subject, author, and keywords.
  - 5. PDF files shall be set up to print legibly at 8.5-inch by 11-inch, 11-inch by 17-inch, or 22-inch by 34-inch. No other paper sizes will be accepted.
  - 6. Submit new electronic files for each resubmittal.
  - 7. Include a copy of the Transmittal of Contractor's Submittal form, located at end of section, with each electronic file.
  - 8. Engineer will reject submittal that is not electronically submitted, unless specifically accepted.
  - 9. Provide Engineer with authorization to reproduce and distribute each file as many times as necessary for Project documentation.
  - 10. Detailed procedures for handling electronic submittals will be discussed at the preconstruction conference.

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## C. Transmittal of Submittal:

1. Contractor shall:
  - a. Review each submittal and check for compliance with Contract Documents.
  - b. Stamp each submittal with uniform approval stamp before submitting to Engineer.
    - 1) Stamp to include Project name, submittal number, Specification number, Contractor's reviewer name, date of Contractor's approval, and statement certifying submittal has been reviewed, checked, and approved for compliance with Contract Documents.
    - 2) Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
2. Complete, sign, and transmit with each submittal package, one Transmittal of Contractor's Submittal form attached at end of this section.
3. Identify each submittal with the following:
  - a. Numbering and Tracking System:
    - 1) Sequentially number each submittal.
    - 2) Resubmission of submittal shall have original number with sequential alphabetic suffix.
  - b. Specification section and paragraph to which submittal applies.
  - c. Project title and Engineer's project number.
  - d. Date of transmittal.
  - e. Names of Contractor, Subcontractor or Supplier, and manufacturer as appropriate.
4. Identify and describe each deviation or variation from Contract Documents.

## D. Format:

1. Do not base Shop Drawings on reproductions of Contract Documents.
2. Package submittal information by individual Specification section. Do not combine different Specification sections together in submittal package, unless otherwise directed in Specification.
3. Present in a clear and thorough manner and in sufficient detail to show kind, size, arrangement, and function of components, materials, and devices, and compliance with Contract Documents.
4. Index with labeled tab dividers in orderly manner.

## E. Timeliness: Schedule and submit in accordance Schedule of Submittals and requirements of individual Specification sections.

## F. Processing Time:

1. Time for review shall commence on Engineer's receipt of submittal.

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2. Engineer will act upon Contractor's submittal and transmit response to Contractor not later than 14 calendar days after receipt, unless otherwise specified.
  3. Resubmittals will be subject to same review time.
  4. No adjustment of Contract Times or Price will be allowed as a result of delays in progress of Work caused by rejection and subsequent resubmittals.
- G. Resubmittals: Clearly identify each correction or change made.
- H. Incomplete Submittals:
1. Engineer will return entire submittal for Contractor's revision if preliminary review deems it incomplete.
  2. When any of the following are missing, submittal will be deemed incomplete:
    - a. Contractor's review stamp; completed and signed.
    - b. Transmittal of Contractor's Submittal; completed and signed.
- I. Submittals not required by Contract Documents:
1. Will not be reviewed and will be returned stamped "Not Subject to Review."
  2. Engineer will keep one scanned copy and return submittal to Contractor.

### 1.03 ACTION SUBMITTALS

- A. Prepare and submit Action Submittals required by individual Specification sections.
- B. Shop Drawings:
1. Copies: One in electronic format.
  2. Identify and Indicate:
    - a. Applicable Contract Drawing and Detail number, products, units and assemblies, and system or equipment identification or tag numbers.
    - b. Equipment and Component Title: Identical to title shown on Drawings.
    - c. Critical field dimensions and relationships to other critical features of Work. Note dimensions established by field measurement.
    - d. Project-specific information drawn accurately to scale.
  3. Manufacturer's standard schematic drawings and diagrams as follows:
    - a. Modify to delete information that is not applicable to the Work.
    - b. Supplement standard information to provide information specifically applicable to the Work.
  4. Product Data: Provide as specified in individual Specifications.
  5. Deferred Submittal: See Drawings for list of deferred submittals.

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- a. Contractor-design drawings and product data related to permanent construction.
    - 1) Written and graphic information.
    - 2) Drawings.
    - 3) Cut sheets.
    - 4) Data sheets.
    - 5) Action item submittals requested in individual Specification section.
  - b. Prior to installation of indicated structural or nonstructural element, equipment, distribution system, or component or its anchorage, submit required supporting data and drawings for review and acceptance by Engineer. Documentation of review and approval provided on Engineer's comment form, along with completed submittal, shall be filed with permitting agency by Contractor and approved by permitting agency prior to installation.
  6. Foreign Manufacturers: When proposed, include names and addresses of at least two companies that maintain technical service representatives close to Project. Materials and equipment supplied shall have a manufacturing process that meets US standards, in order to facilitate repair or replacement.
- C. Action Submittal Dispositions: Engineer will review, comment, stamp, and distribute as noted:
1. Approved:
    - a. Contractor may incorporate product(s) or implement Work covered by submittal.
    - b. Distribution:
      - 1) One scanned copy furnished Owner.
      - 2) One scanned copy furnished Resident Project Representative.
      - 3) One scanned copy retained in Engineer's file.
      - 4) One scanned copy returned to Contractor appropriately annotated.
  2. Approved as Noted:
    - a. Contractor may incorporate product(s) or implement Work covered by submittal, in accordance with Engineer's notations.
    - b. Distribution:
      - 1) One scanned copy furnished Owner.
      - 2) One scanned copy furnished Resident Project Representative.
      - 3) One scanned copy retained in Engineer's file.
      - 4) One scanned copy returned to Contractor appropriately annotated.
  3. Partial Approval, Resubmit as Noted:
    - a. Make corrections or obtain missing portions, and resubmit.
    - b. Except for portions indicated, Contractor may begin to incorporate product(s) or implement Work covered by submittal, in accordance with Engineer's notations.

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- c. Distribution:
  - 1) One scanned copy furnished Owner.
  - 2) One scanned copy furnished Resident Project Representative.
  - 3) One scanned copy retained in Engineer's file.
  - 4) One scanned copy returned to Contractor appropriately annotated.
- 4. Revise and Resubmit:
  - a. Contractor may not incorporate product(s) or implement Work covered by submittal.
  - b. Distribution:
    - 1) One scanned copy furnished Resident Project Representative.
    - 2) One scanned copy retained in Engineer's file.
    - 3) One scanned copy returned to Contractor appropriately annotated.

#### 1.04 INFORMATIONAL SUBMITTALS

##### A. General:

- 1. Copies: Submit one copy in electronic format, unless otherwise indicated in individual Specification section.
- 2. Refer to individual Specification sections for specific submittal requirements.
- 3. Engineer will review each submittal. If submittal meets conditions of the Contract, Engineer will forward copy to appropriate parties. If Engineer determines submittal does not meet conditions of the Contract and is therefore considered unacceptable, Engineer will retain a scanned and return one scanned copy with review comments to Contractor, and require that submittal be corrected and resubmitted.

##### B. Certificates:

- 1. General:
  - a. Provide notarized statement that includes signature of entity responsible for preparing certification.
  - b. Signed by officer or other individual authorized to sign documents on behalf of that entity.
- 2. Welding: In accordance with individual Specification sections.
- 3. Installer: Prepare written statements on manufacturer's letterhead certifying installer complies with requirements as specified in individual Specification section.
- 4. Material Test: Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
- 5. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by Laws and Regulations or governing agency or specified in individual Specification sections.

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6. Manufacturer's Certificate of Compliance: In accordance with Section 01 61 00, Common Product Requirements.
  7. Manufacturer's Certificate of Proper Installation: In accordance with Section 01 43 33, Manufacturers' Field Services.
- C. Construction Photographs: In accordance with Section 01 31 13, Project Coordination, and as may otherwise be required in Contract Documents.
- D. Closeout Submittals: In accordance with Section 01 77 00, Closeout Procedures.
- E. Contractor-design Data (related to temporary construction):
1. Written and graphic information.
  2. List of assumptions.
  3. List of performance and design criteria.
  4. Summary of loads or load diagram, if applicable.
  5. Calculations.
  6. List of applicable codes and regulations.
  7. Name and version of software.
  8. Information requested in individual Specification section.
- F. Manufacturer's Instructions: Written or published information that documents manufacturer's recommendations, guidelines, and procedures in accordance with individual Specification section.
- G. Operation and Maintenance Data: As required in Section 01 78 23, Operation and Maintenance Data.
- H. Payment:
1. Application for Payment: In accordance with Section 01 29 00, Payment Procedures.
  2. Schedule of Values: In accordance with Section 01 29 00, Payment Procedures.
  3. Schedule of Estimated Progress Payments: In accordance with Section 01 29 00, Payment Procedures.
- I. Quality Control Documentation: As required in Division 1, General Requirements of individual specification sections.
- J. Schedules:
1. Schedule of Submittals: Prepare separately or in combination with Progress Schedule as specified in Division 1, General Requirements for each specification section.
    - a. Show for each, at a minimum, the following:
      - 1) Specification section number.

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- 2) Identification by numbering and tracking system as specified under Paragraph Transmittal of Submittal.
  - 3) Estimated date of submission to Engineer, including reviewing and processing time.
  - b. On a monthly basis, submit updated Schedule of Submittals to Engineer if changes have occurred or resubmittals are required.
  2. Progress Schedules: In accordance with Division 1, General Requirements.
- K. Special Guarantee: Supplier's written guarantee as required in individual Specification sections.
- L. Submittals Required by Laws, Regulations, and Governing Agencies:
1. Promptly submit promptly notifications, reports, certifications, payrolls, and otherwise as may be required, directly to the applicable federal, state, or local governing agency or their representative.
  2. Transmit to Engineer for Owner's records one copy of correspondence and transmittals (to include enclosures and attachments) between Contractor and governing agency.
- M. Test, Evaluation, and Inspection Reports:
1. General: Shall contain signature of person responsible for test or report.
  2. Factory:
    - a. Identification of product and Specification section, type of inspection or test with referenced standard or code.
    - b. Date of test, Project title and number, and name and signature of authorized person.
    - c. Test results.
    - d. If test or inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.
    - e. Provide interpretation of test results, when requested by Engineer.
    - f. Other items as identified in individual Specification sections.
  3. Field:
    - a. As a minimum, include the following:
      - 1) Project title and number.
      - 2) Date and time.
      - 3) Record of temperature and weather conditions.
      - 4) Identification of product and Specification section.
      - 5) Type and location of test, Sample, or inspection, including referenced standard or code.
      - 6) Date issued, testing laboratory name, address, and telephone number, and name and signature of laboratory inspector.
      - 7) If test or inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.

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- 8) Provide interpretation of test results, when requested by Engineer.
- 9) Other items as identified in individual Specification sections.

N. Testing and Startup Data: In accordance with Section 01 91 14, Equipment Testing and Facility Startup.

O. Training Data: In accordance with Section 01 43 33, Manufacturers' Field Services.

1.05 SUPPLEMENTS

A. The supplements listed below, following "End of Section", are part of this specification.

1. Forms: Transmittal of Contractor's Submittal.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**

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<b>TRANSMITTAL OF CONTRACTOR'S SUBMITTAL</b> (ATTACH TO EACH SUBMITTAL)			
DATE: _____			
<b>TO:</b> _____ _____ _____ _____ _____  <b>FROM:</b> _____ Contractor _____ _____ _____	Submittal No.: _____ <input type="checkbox"/> New Submittal <input type="checkbox"/> Resubmittal Project: _____ Project No.: _____ Specification Section No.: _____ (Cover only one section with each transmittal) Schedule Date of Submittal: _____		
<b>SUBMITTAL TYPE:</b>	<input type="checkbox"/> Shop Drawing	<input type="checkbox"/> Sample	<input type="checkbox"/> Informational
	<input type="checkbox"/> Deferred		

**The following items are hereby submitted:**

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Spec. and Para. No.	Drawing or Brochure Number	Contains Variation to Contract	
				No	Yes

Contractor hereby certifies that (i) Contractor has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies.

By: \_\_\_\_\_  
 Contractor (Authorized Signature)

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**SECTION 01 42 13**  
**ABBREVIATIONS AND ACRONYMS**

**PART 1 GENERAL**

1.01 REFERENCE TO STANDARDS AND SPECIFICATIONS OF TECHNICAL SOCIETIES

- A. Reference to standards and specifications of technical societies and reporting and resolving discrepancies associated therewith shall be as required herein and in the individual specification sections.
- B. Work specified by reference to published standard or specification of government agency, technical association, trade association, professional society or institute, testing agency, or other organization shall meet requirements or surpass minimum standards of quality for materials and workmanship established by designated standard or specification.
- C. Where so specified, products or workmanship shall also meet or exceed additional prescriptive or performance requirements included within Contract Documents to establish a higher or more stringent standard of quality than required by referenced standard.
- D. Where two or more standards are specified to establish quality, product and workmanship shall meet or exceed requirements of most stringent.
- E. Where both a standard and a brand name are specified for a product in Contract Documents, proprietary product named shall meet or exceed requirements of specified reference standard.
- F. Copies of standards and specifications of technical societies:
  - 1. Copies of applicable referenced standards have not been bound in these Contract Documents.
  - 2. Where copies of standards are needed by Contractor, obtain a copy or copies directly from publication source and maintain in an orderly manner at the Site as Work Site records, available to Contractor's personnel, Subcontractors, Owner, and Engineer.

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## 1.02 ABBREVIATIONS

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

1.	AA	Aluminum Association
2.	AABC	Associated Air Balance Council
3.	AAMA	American Architectural Manufacturers Association
4.	AASHTO	American Association of State Highway and Transportation Officials
5.	ABMA	American Bearing Manufacturers' Association
6.	ACI	American Concrete Institute
7.	AEIC	Association of Edison Illuminating Companies
8.	AGA	American Gas Association
9.	AGMA	American Gear Manufacturers' Association
10.	AI	Asphalt Institute
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AITC	American Institute of Timber Construction
14.	ALS	American Lumber Standards
15.	AMCA	Air Movement and Control Association
16.	ANSI	American National Standards Institute
17.	APA	APA – The Engineered Wood Association
18.	API	American Petroleum Institute
19.	APWA	American Public Works Association
20.	AHRI	Air-Conditioning, Heating, and Refrigeration Institute
21.	ASA	Acoustical Society of America
22.	ASABE	American Society of Agricultural and Biological Engineers
23.	ASCE	American Society of Civil Engineers
24.	ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
25.	ASME	American Society of Mechanical Engineers
26.	ASNT	American Society for Nondestructive Testing
27.	ASSE	American Society of Sanitary Engineering
28.	ASTM	ASTM International
29.	AWI	Architectural Woodwork Institute
30.	AWPA	American Wood Preservers' Association
31.	AWPI	American Wood Preservers' Institute
32.	AWS	American Welding Society
33.	AWWA	American Water Works Association
34.	BHMA	Builders Hardware Manufacturers' Association

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35.	CBM	Certified Ballast Manufacturer
36.	CDA	Copper Development Association
37.	CGA	Compressed Gas Association
38.	CISPI	Cast Iron Soil Pipe Institute
39.	CMAA	Crane Manufacturers' Association of America
40.	CRSI	Concrete Reinforcing Steel Institute
41.	CS	Commercial Standard
42.	CSA	Canadian Standards Association
43.	CSI	Construction Specifications Institute
44.	DIN	Deutsches Institut für Normung e.V.
45.	DIPRA	Ductile Iron Pipe Research Association
46.	EIA	Electronic Industries Alliance
47.	EJCDC	Engineers Joint Contract Documents' Committee
48.	ETL	Electrical Test Laboratories
49.	FAA	Federal Aviation Administration
50.	FCC	Federal Communications Commission
51.	FDA	Food and Drug Administration
52.	FEMA	Federal Emergency Management Agency
53.	FIPS	Federal Information Processing Standards
54.	FM	FM Global
55.	Fed. Spec.	Federal Specifications (FAA Specifications)
56.	FS	Federal Specifications and Standards (Technical Specifications)
57.	GA	Gypsum Association
58.	GANA	Glass Association of North America
59.	HI	Hydraulic Institute
60.	HMI	Hoist Manufacturers' Institute
61.	IBC	International Building Code
62.	ICBO	International Conference of Building Officials
63.	ICC	International Code Council
64.	ICEA	Insulated Cable Engineers' Association
65.	IFC	International Fire Code
66.	IEEE	Institute of Electrical and Electronics Engineers, Inc.
67.	IESNA	Illuminating Engineering Society of North America
68.	IFI	Industrial Fasteners Institute
69.	IGMA	Insulating Glass Manufacturer's Alliance
70.	IMC	International Mechanical Code
71.	INDA	Association of the Nonwoven Fabrics Industry
72.	IPC	International Plumbing Code
73.	ISA	International Society of Automation
74.	ISO	International Organization for Standardization
75.	ITL	Independent Testing Laboratory
76.	JIC	Joint Industry Conferences of Hydraulic Manufacturers

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77.	MIA	Marble Institute of America
78.	MIL	Military Specifications
79.	MMA	Monorail Manufacturers' Association
80.	MSS	Manufacturer's Standardization Society
81.	NAAMM	National Association of Architectural Metal Manufacturers
82.	NACE	NACE International
83.	NBGQA	National Building Granite Quarries Association
84.	NEBB	National Environmental Balancing Bureau
85.	NEC	National Electrical Code
86.	NECA	National Electrical Contractor's Association
87.	NEMA	National Electrical Manufacturers' Association
88.	NESC	National Electrical Safety Code
89.	NETA	InterNational Electrical Testing Association
90.	NFPA	National Fire Protection Association
91.	NHLA	National Hardwood Lumber Association
92.	NICET	National Institute for Certification in Engineering Technologies
93.	NIST	National Institute of Standards and Technology
94.	NRCA	National Roofing Contractors Association
95.	NRTL	Nationally Recognized Testing Laboratories
96.	NSF	NSF International
97.	NSPE	National Society of Professional Engineers
98.	NTMA	National Terrazzo and Mosaic Association
99.	NWWDA	National Wood Window and Door Association
100.	OSHA	Occupational Safety and Health Act (both Federal and State)
101.	PCI	Precast/Prestressed Concrete Institute
102.	PEI	Porcelain Enamel Institute
103.	PPI	Plastic Pipe Institute
104.	PS	Product Standards Section-U.S. Department of Commerce
105.	RMA	Rubber Manufacturers' Association
106.	RUS	Rural Utilities Service
107.	SAE	SAE International
108.	SDI	Steel Deck Institute
109.	SDI	Steel Door Institute
110.	SJI	Steel Joist Institute
111.	SMACNA	Sheet Metal and Air Conditioning Contractors National Association
112.	SPI	Society of the Plastics Industry
113.	SSPC	The Society for Protective Coatings
114.	STI/SPFA	Steel Tank Institute/Steel Plate Fabricators Association
115.	SWI	Steel Window Institute
116.	TEMA	Tubular Exchanger Manufacturers' Association

## ABBREVIATIONS AND ACRONYMS

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117. TCA	Tile Council of North America
118. TIA	Telecommunications Industry Association
119. UBC	Uniform Building Code
120. UFC	Uniform Fire Code
121. UL	formerly Underwriters Laboratories Inc.
122. UMC	Uniform Mechanical Code
123. USBR	U.S. Bureau of Reclamation
124. WCLIB	West Coast Lumber Inspection Bureau
125. WI	Wood Institute
126. WWPA	Western Wood Products Association

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01 43 33**  
**MANUFACTURERS' FIELD SERVICES**

**PART 1 GENERAL**

1.01 DEFINITIONS

- A. Person-Day: One person for 8 hours within regular Contractor working hours.

1.02 SUBMITTALS

- A. Informational Submittals:

1. Training Schedule: Submit, in accordance with requirements of this Specification, not less than 21 calendar days prior to start of equipment installation and revise as necessary for acceptance.
2. Lesson Plan: Submit, in accordance with requirements of this Specification, proposed lesson plan not less than 21 calendar days prior to scheduled training and revise as necessary for acceptance.

1.03 QUALIFICATION OF MANUFACTURER'S REPRESENTATIVE

- A. Authorized representative of the manufacturer, factory trained, and experienced in the technical applications, installation, operation, and maintenance of respective equipment, subsystem, or system, with full authority by the equipment manufacturer to issue the certifications required of the manufacturer. Additional qualifications may be specified in the individual specification section.
- B. Representative subject to acceptance by Owner. No substitute representatives will be allowed unless prior written approval by such has been given.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION**

1.01 FULFILLMENT OF SPECIFIED MINIMUM SERVICES

- A. Furnish manufacturers' services, when required by an individual specification section, to meet the requirements of this section.
- B. Where time is necessary in excess of that stated in the Specifications for manufacturers' services, or when a minimum time is not specified, time required to perform specified services shall be considered incidental.
- C. Schedule manufacturer' services to avoid conflict with other onsite testing or other manufacturers' onsite services.

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- D. Determine, before scheduling services, that conditions necessary to allow successful testing have been met.
- E. Only those days of service approved by Engineer will be credited to fulfill specified minimum services.
- F. When specified in individual specification sections, manufacturer's onsite services shall include:
  - 1. Assistance during product (system, subsystem, or component) installation to include observation, guidance, instruction of Contractor's assembly, erection, installation or application procedures.
  - 2. Inspection, checking, and adjustment as required for product (system, subsystem, or component) to function as warranted by manufacturer and necessary to furnish Manufacturer's Certificate of Proper Installation.
  - 3. Providing, on a daily basis, copies of manufacturers' representatives field notes and data to Engineer.
  - 4. Revisiting the Site as required to correct problems and until installation and operation are acceptable to Engineer.
  - 5. Resolution of assembly or installation problems attributable to or associated with respective manufacturer's products and systems.
  - 6. Assistance during functional and performance testing, and facility startup and evaluation.
  - 7. Training of Owner's personnel in the operation and maintenance of respective product as required.

## 1.02 MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

- A. When so specified, a Manufacturer's Certificate of Proper Installation form, a copy of which is attached to this section, shall be completed and signed by equipment manufacturer's representative.
- B. Such form shall certify signing party is a duly authorized representative of manufacturer, is empowered by manufacturer to inspect, approve, and operate their equipment and is authorized to make recommendations required to ensure equipment is complete and operational.

## 1.03 TRAINING

- A. General:
  - 1. Furnish manufacturers' representatives for detailed classroom and hands-on training to Owner's personnel on operation and maintenance of specified product (system, subsystem, component) and as may be required in applicable Specifications.

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2. Furnish trained, articulate personnel to coordinate and expedite training, to be present during training coordination meetings with Owner, and familiar with operation and maintenance manual information specified in Section 01 78 23, Operation and Maintenance Data.
  3. Manufacturer's representative shall be familiar with facility operation and maintenance requirements as well as with specified equipment.
  4. Furnish complete training materials, to include operation and maintenance data, to be retained by each trainee.
- B. Training Schedule:
1. List specified equipment and systems that require training services and show:
    - a. Respective manufacturer.
    - b. Estimated dates for installation completion.
    - c. Estimated training dates.
  2. Allow for multiple sessions when several shifts are involved.
  3. Adjust schedule to ensure training of appropriate personnel as deemed necessary by Owner, and to allow full participation by manufacturers' representatives. Adjust schedule for interruptions in operability of equipment.
  4. Coordinate with Section 01 91 14, Equipment Testing and Facility Startup.
- C. Lesson Plan: When manufacturer or vendor training of Owner personnel is specified, prepare a lesson plan for each required course containing the following minimum information:
1. Title and objectives.
  2. Recommended attendees (such as, managers, engineers, operators, maintenance).
  3. Course description, outline of course content, and estimated class duration.
  4. Format (such as, lecture, self-study, demonstration, hands-on).
  5. Instruction materials and equipment requirements.
  6. Resumes of instructors providing training.
- D. Prestartup Training:
1. Coordinate training sessions with Owner's operating personnel and manufacturers' representatives, and with submission of operation and maintenance manuals in accordance with Section 01 78 23, Operation and Maintenance Data.
  2. Complete at least 14 calendar days prior to beginning of facility startup.
- E. Post-startup Training: If required in Specifications, furnish and coordinate training of Owner's operating personnel by respective manufacturer's representatives.

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1.04 SUPPLEMENTS

A. The supplement listed below, following “End of Section,” is part of this specification.

1. Manufacturer’s Certificate of Proper Installation.

**END OF SECTION**

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**MANUFACTURER’S CERTIFICATE OF PROPER INSTALLATION**

OWNER \_\_\_\_\_ EQPT SERIAL NO: \_\_\_\_\_  
 EQPT TAG NO: \_\_\_\_\_ EQPT/SYSTEM: \_\_\_\_\_  
 PROJECT NO: \_\_\_\_\_ SPEC. SECTION: \_\_\_\_\_

I hereby certify that the above-referenced equipment/system has been:

(Check Applicable)

- Installed in accordance with Manufacturer’s recommendations.
- Inspected, checked, and adjusted.
- Serviced with proper initial lubricants.
- Electrical and mechanical connections meet quality and safety standards.
- All applicable safety equipment has been properly installed.
- Recommended spare parts have been delivered and accepted by the City.
- Functional tests.
- System has been performance tested, and meets or exceeds specified performance requirements. (When complete system of one manufacturer)

Note: Attach any performance test documentation from manufacturer.

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

I, the undersigned Manufacturer’s Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate their equipment and (iii) authorized to make recommendations required to ensure equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date: \_\_\_\_\_, 20\_\_

Manufacturer: \_\_\_\_\_

By Manufacturer’s Authorized Representative: \_\_\_\_\_  
 (Authorized Signature)

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**SECTION 01 50 00**  
**TEMPORARY FACILITIES AND CONTROLS**

**PART 1 GENERAL**

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Association of Nurserymen (AAN): American Standards for Nursery Stock.
  2. Federal Emergency Management Agency (FEMA).
  3. National Fire Prevention Association (NFPA): 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.
  4. Telecommunications Industry Association (TIA); Electronic Industries Alliance (EIA): 568B, Commercial Building Telecommunications Cabling Standard.
  5. U.S. Department of Agriculture (USDA): Urban Hydrology for Small Watersheds.
  6. U.S. Weather Bureau: Rainfall-Frequency Atlas of the U.S. for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years.

1.02 SUBMITTALS

- A. Informational Submittals:
1. Copies of permits and approvals for construction as required by Laws and Regulations and governing agencies.
  2. Temporary Construction Submittals:
    - a. Parking area plans.
    - b. Contractor's field office, storage yard, and storage building plans, including gravel surfaced area.
    - c. Staging area location plan.
    - d. Plan for temporary sodium hypochlorite tank storage and piping.

1.03 MOBILIZATION

- A. Mobilization includes, but is not limited to, these principal items:
1. Obtaining required permits.
  2. Moving Contractor's equipment required for first month operations onto Site.
  3. Providing onsite sanitary facilities and potable water facilities as specified and as required by Laws and Regulations, and governing agencies.
  4. Arranging for and erection of Contractor's work and storage yard.
  5. Posting OSHA required notices and establishing safety programs and procedures.

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6. Having Contractor's superintendent at Site full time.

## 1.04 PROTECTION OF WORK AND PROPERTY

- A. Comply with Owner's safety rules while on Owner's property.
- B. Keep Owner informed of serious onsite accidents and related claims.
- C. Use of Explosives: No blasting or use of explosives will be allowed onsite.
- D. Fire Protection: Furnish and maintain on Site adequate firefighting equipment capable of extinguishing incipient fires. Comply with applicable parts of NFPA 241.

## 1.05 SAFETY REQUIREMENTS

## A. General:

1. Maintain in continuous service existing oil and gas pipelines, underground power, telephone or communication cable, water mains, irrigation lines, sewers, poles and overhead power, and other utilities encountered along line of the Work, unless other arrangements satisfactory to owners of said utilities have been made.
2. Where completion of the Work requires temporary or permanent removal or relocation of existing utility, coordinate activities with owner of said utility and perform work to their satisfaction.
3. Protect, shore, brace, support, and maintain underground pipes, conduits, drains, and other underground utility construction uncovered or otherwise affected by construction operations.
4. Keep fire hydrants and water control valves free from obstruction and available for use at all times.
5. Do not impair operation of existing sewer system. Prevent construction material, pavement, concrete, earth, volatile and corrosive wastes, and other debris from entering sewers, pump stations, or other sewer structures.
6. Maintain original Site drainage wherever possible.

## B. Barricades and Lights:

1. Provide as necessary to prevent unauthorized entry to construction areas and affected roads, streets, and alleyways, inside and outside of fenced area, and as required to ensure public safety and the safety of Contractor's employees, other employer's employees, and others who may be affected by the Work.
2. Provide to protect existing facilities and adjacent properties from potential damage.
3. Locate to enable access by facility operators and property owners.
4. Illuminate barricades and obstructions with warning lights from sunset to sunrise.

- C. Finished Construction: Protect finished floors and concrete floors exposed as well as those covered with composition tile or other applied surfacing.

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- D. Waterways: Keep ditches, culverts, and natural drainages continuously free of construction materials and debris.
- E. Dewatering: Construct, maintain, and operate cofferdams, channels, flume drains, sumps, pumps, or other temporary diversion and protection works. Furnish materials required, install, maintain, and operate necessary pumping and other equipment for the environmentally safe removal and disposal of water from the various parts of the Work. Maintain foundations and parts of the Work free from water.

## 1.06 TEMPORARY CONTROLS

- A. Air Pollution Control:
  - 1. Minimize air pollution from construction operations.
  - 2. Provide and maintain temporary dust-tight partitions, bulkheads, or other protective devices during construction to permit normal operation of existing facilities. Construct partitions of plywood, insulating board, plastic sheets, or similar material. Construct partitions in such a manner that dust and dirt from demolition and cutting will not enter other parts of existing building or facilities. Remove temporary partitions as soon as need no longer exists.
- B. Noise Control:
  - 1. Noise Control Plan: Propose plan to mitigate construction noise and to comply with noise control ordinances, including method of construction, equipment to be used, and acoustical treatments.
- C. Water Pollution Control:
  - 1. Divert sanitary sewage and nonstorm waste flow interfering with construction and requiring diversion to sanitary sewers. Do not cause or permit action to occur which would cause an overflow to existing waterway.
  - 2. Prior to commencing excavation and construction, obtain Engineer's agreement with detailed plans showing procedures intended to handle and dispose of sewage, groundwater, and dewatering pump discharges.
  - 3. Comply with Section 01 57 13, Temporary Erosion and Sedimentation Control, for storm water flow and surface runoff.
  - 4. Do not dispose of volatile wastes such as mineral spirits, oil, chemicals, or paint thinner in storm or sanitary drains. Disposal of wastes into streams or waterways is prohibited. Provide acceptable containers for collection and disposal of waste materials, debris, and rubbish.
- D. Erosion, Sediment, and Flood Control: Provide, maintain, and operate temporary facilities as specified in Section 01 57 13, Temporary Erosion and Sedimentation Control, to control erosion and sediment releases, and to protect the Work and existing facilities from flooding during construction period.

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1.07 STORAGE YARDS AND BUILDINGS

- A. Coordinate requirements with Section 01 61 00, Common Product Requirements.
- B. Temporary Storage Yards: Construct temporary storage yards for storage of products that are not subject to damage by weather conditions.
- C. Temporary Storage Buildings:
  - 1. Provide environmental control systems that meet recommendations of manufacturers of equipment and materials stored.
  - 2. Arrange or partition to provide security of contents and ready access for inspection and inventory.
  - 3. Store combustible materials (paints, solvents, fuels) in a well-ventilated and remote building meeting safety standards.

1.08 PARKING AREAS

- A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations.

1.09 CLEANING DURING CONSTRUCTION

- A. In accordance with General Conditions, as may be specified in other Specification sections, and as required herein.
- B. Wet down exterior surfaces prior to sweeping to prevent blowing of dust and debris. At least weekly, sweep floors (basins, tunnels, platforms, walkways, roof surfaces), and pick up and dispose of debris.
- C. Provide approved containers for collection and disposal of waste materials, debris, and rubbish. At least weekly, dispose of such waste materials, debris, and rubbish offsite.
- D. At least weekly, brush sweep entry drive, roadways, and other streets and walkways affected by the Work and where adjacent to the Work. Contractor to minimize dust during sweeping.

**END OF SECTION**

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**SECTION 01 57 13**  
**TEMPORARY EROSION AND SEDIMENT CONTROL****PART 1 GENERAL**

## 1.01 SUMMARY

- A. This section covers Work to implement structural and nonstructural Best Management Practices (BMP) to control soil erosion by wind or water and keep eroded sediments and other construction-generated pollutants from moving off project sites. Requirements described in this specification and shown on the Drawings are part of the project Temporary Erosion and Sediment Control Plan (TESC Plan) and are the minimum for all project construction sites and conditions. This specification covers all project activities, including material sources, disposal sites, and offsite mitigation areas unless specific project activities are excluded elsewhere in this specification or in other Contract Documents controlling the Work.
- B. National Pollutant Discharge Elimination System: Comply with Federal, state, and local laws, rules and regulations, and the National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Discharge Permit or Permits applicable to the project. A copy of the Project's General Construction Permit, if applicable to the Project, is available from Owner. NPDES General Construction permits are required on projects that involve disturbance of 1 acre or more with potential to discharge stormwater to surface waters.
- C. Other Regulations: A local government erosion and sediment control permit may apply and some local agency requirements may be more stringent than this specification. Adequate erosion and sediment control is essential for complying with the federal Endangered Species Act where construction runoff enters waters inhabited by protected species.

## 1.02 REFERENCES

- A. Activities shall conform to the Ft Lauderdale Erosion and Sediment Control Manual, and Drawings. In the event of a conflict, the more stringent requirement shall apply.
- B. The following is a list of standards that may be referenced in this section:
  - 1. American Association of State Highway and Transportation Officials (AASHTO): M252, Standard Specification for Corrugated Polyethylene Drainage Pipe.
  - 2. ASTM International (ASTM):
    - a. D638, Standard Test Method for Tensile Properties of Plastics.

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- b. D2974, Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.
  - c. D3776/D3776M, Standard Test Methods for Mass Per Unit Area (Weight) of Fabric.
  - d. D4355, Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus.
  - e. D4397, Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
  - f. D4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
  - g. D4533, Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
  - h. D4632/D4632M, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
  - i. D4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
  - j. D6241, Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.
  - k. D6459, Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Hillslopes from Rainfall-Induced Erosion.
  - l. D6460, Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Earthen Channels from Stormwater-Induced Erosion.
  - m. D6475, Standard Test Method for Measuring Mass Per Unit Area of Erosion Control Blankets.
  - n. D7322, Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Ability to Encourage Seed Germination and Plant Growth Under Bench-Scale Conditions.
  - o. D7367, Standard Test Method for Determining Water Holding Capacity of Fiber Mulches for Hydraulic Planting.
- 3. National Weather Service:
    - a. Precipitation-Frequency of the United States by State/Territory, 2012.
    - b. Precipitation Frequency Data Server, 2012.
  - 4. North American Weed Management Association (NAWMA).
  - 5. U.S. Department of Agriculture, Natural Resources Conservation Service: *Urban Hydrology for Small Watersheds*; 1986. Technical Release 55.
  - 6. U.S. Environmental Protection Agency:
    - a. Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites, 2007. EPA-833-R-06-004.
    - b. National Menu of BMPs, 2012.

### 1.03 SYSTEM DESCRIPTION

#### A. Erosion and Sediment Control:

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1. Provide, maintain, and operate temporary facilities to control erosion and sediment releases during construction period.
  2. Design erosion and sediment controls to handle peak runoff resulting from 25-year, 24-hour storm event based on National Weather Service: Precipitation Frequency Data Server.
  3. Size temporary stormwater conveyances based on procedures presented in U.S. Department of Agriculture, Natural Resources Conservation Service: Urban Hydrology for Small Watersheds, 1986. Technical Release 55.
- B. Erosion and Sediment Control (ESC) Lead:
1. Identify the ESC Lead at the preconstruction discussions and in the TESC Plan. The ESC Lead shall have certification in construction site erosion and sediment control from a course approved by Owner.
  2. The ESC Lead shall implement the TESC Plan, including, but not limited to:
    - a. Installing and maintaining all temporary erosion and sediment control Best Management Practices (BMPs) included in the TESC Plan to assure continued performance of their intended function. Damaged or inadequate TESC BMPs shall be corrected immediately.
    - b. Updating TESC Plan to reflect current field conditions.
    - c. Terminating TESC Plan.
- C. Personnel Training: Prior to commencement of construction, applicable personnel must have an understanding of the Construction Stormwater Discharge Permit's requirements and their specific responsibilities under the permit. At a minimum, personnel must be trained to understand the following as it relates to the scope of their job duties:
1. The location of all stormwater controls and how to maintain them.
  2. Procedures for complying with the pollution prevention requirements.
  3. Procedures for conducting inspections, recording findings, and taking corrective action.
- D. Temporary Erosion and Sediment Control Plan (Stormwater Pollution Prevention Plan).
- E. Preventing erosion, and controlling runoff, sedimentation, and non-stormwater pollution, requires Contractor to perform temporary Work items including, but not limited to:
1. Providing ditches, berms, culverts, and other measures to control surface water.
  2. Controlling underground water found during construction.

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- F. Engineer may require additional temporary control measures if it appears pollution or erosion may result from weather, nature of materials, or progress on the Work.
- G. Install all sediment control devices including, but not limited to, sediment ponds, perimeter silt fencing, or other sediment trapping BMPs prior to any ground disturbing activity. Do not expose more erodible earth than necessary during clearing, grubbing, excavation, borrow, or fill activities without written approval by Engineer. Engineer may increase or decrease the limits based on project conditions. Erodible earth is defined as any surface where soils, grindings, or other materials may be capable of being displaced and transported by rain, wind, or surface water runoff. Cover inactive areas of erodible earth, whether at final grade or not, within specified time period (see [NPDES] Erosion and Sediment Control Permit), using an approved soil covering practice. Phase clearing and grading to maximum extent practical to prevent exposed inactive areas from becoming a source of erosion.
- H. Water Management:
1. Manage site water in accordance with the conditions of the waste discharge permit from a local permitting authority. If site water management is not subject to permit, manage as follows:
    - a. Groundwater. When groundwater is encountered in an excavation, treat and discharge as follows:
      - 1) When groundwater conforms to South Florida Water management District Water Quality Standards, it may bypass detention and treatment facilities and be routed directly to its normal discharge point at a rate and method that will not cause erosion.
      - 2) When turbidity of groundwater is similar to turbidity of site runoff, groundwater may be treated using same detention and treatment facilities being used to treat the site runoff and then discharged at a rate that will not cause erosion.
      - 3) When groundwater turbidity is greater than turbidity of site runoff, treat ground water separately until turbidity is similar to or better than site runoff, and then it may be combined with site runoff and treated as described above.
- I. If Engineer orders the Work suspended, continue to control erosion, pollution, and runoff during the shutdown.
- J. Nothing in this section shall relieve Contractor from complying with other Contract requirements.

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**PART 2 PRODUCTS**

## 1.01 CHECK DAMS

- A. Specified by Contractor with approval of Engineer.

## 1.02 COIR LOG

- A. Logs made of 100 percent durable coconut (coir) fiber uniformly compacted within woven netting.
- B. Netting: Made of bristle coir twine with minimum strength of 80 pounds tensile strength. Nominal 2-inch by 2-inch openings.
- C. Log Segments: Maximum length of 20 feet, with a minimum diameter as shown on the Drawings.
- D. Log Minimum Density: 7 lbs/cf.
- E. Stakes: Untreated softwood species with a notch to secure rope ties.
- F. Rope Ties: 1/4-inch diameter commercially available hemp rope.

## 1.03 COMPOST SOCK

- A. Provide socks fabricated from of extra heavy weight biodegradable fabric, with a minimum strand thickness of 5 mils.
- B. Fill fabric with Coarse Compost.
- C. Diameter: 8 inches minimum.
- D. Fabric: Clean, evenly woven, and free of encrusted concrete or other contaminating materials. Shall be free from cuts, tears, broken or missing yarns. Shall be free of thin, open, or weak areas. Shall be free of any type of preservative.
- E. Wood Stakes: Untreated softwood species, be 2-inch by 2-inch nominal dimension and 36 inches in length.

## 1.04 SEEDING

- A. See Section 32 92 00, Turf and Grasses.

## 1.05 SILT (SEDIMENT) FENCE

- A. Geotextile: As specified in Article Geotextile.
- B. Support Posts: As recommended by manufacturer of geotextile.

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- C. Fasteners: Heavy-duty wire staples at least 1-inch long, tie wires, or hog rings, as recommended by manufacturer of geotextile.

1.06 STREET CLEANING

- A. Use self-propelled pickup street sweeper(s). Mechanical broom sweepers are not allowed where environmental concerns exist about storm water pollution or air quality.

**PART 3 EXECUTION**

1.01 PREPARATION

- A. Engineer's acceptance of the TESC Plan is required prior to starting earth disturbing activities.
- B. Include proposed stockpile areas and installation of temporary erosion control devices, ditches, or other facilities in Work phasing plans.
- C. Areas designated for Contractor's use during Project may be temporarily developed as specified to provide working, staging, and administrative areas. Include control of sediment from these areas in the TESC Plan.
- D. Silt (Sediment) Fence:
  1. Silt fence shall be installed in accordance with the Drawings. When backup support is used, use steel wire with a maximum mesh spacing of 2 inches by 4 inches, or plastic mesh as resistant to ultraviolet radiation as the geotextile it supports. Provide wire or plastic mesh with strength equivalent to or greater than as required for unsupported geotextile (for example, 180 pounds grab tensile strength in the machine direction).
  2. Attach geotextile to posts and support system using staples, wire, or in accordance with manufacturer's recommendations. Geotextile shall be sewn together at the point of manufacture, or at a location approved by Engineer, to form geotextile lengths as required.
  3. Provide wood or steel support posts at sewn seams and overlaps and as shown on the Drawings and necessary to support fence.
  4. Wood Posts: Minimum dimensions of 1-1/4-inch by 1-1/4-inch by the minimum length shown on the Drawings.
  5. Steel Posts: Minimum weight of 0.90 lb/ft.
  6. When sediment deposits reach approximately one-third the height of the silt fence, remove and stabilize deposits.
- E. Street Cleaning: Use self-propelled pickup street sweepers whenever required by Engineer to prevent transport of sediment and other debris off Project Site. Provide street sweepers designed and operated to meet air quality standards. Street washing with water will require approval by Engineer. Intentional washing

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of sediment into storm sewers or drainage ways must not occur. Vacuuming or dry sweeping and material pickup must be used to cleanup released sediments.

## 1.02 MAINTENANCE

- A. The ESCP measures described in this specification are minimum requirements for anticipated Site conditions. During the construction period, upgrade these measures as needed to comply with all applicable local, state, and federal erosion and sediment control regulations.
- B. Maintain erosion and sediment control BMPs so they properly perform their function until Engineer determines they are no longer needed.
- C. Construction activities must avoid or minimize excavation and creation of bare ground during wet weather.
- D. The intentional washing of sediment into storm sewers or drainage ways must not occur. Vacuuming or dry sweeping and material pickup must be used to cleanup released sediments.
- E. Inspect BMPs in accordance with the schedule in the Construction Stormwater Discharge Permit(s) or as directed by Engineer.
- F. Complete an inspection report within 24 hours of an inspection. Each inspection report shall be signed and identify corrective actions. Document that corrective actions are performed within 7 days of identification. Keep a copy of all inspection reports at the Site or at an easily accessible location.
- G. Unless otherwise specified, remove deposits before the depth of accumulated sediment and debris reaches approximately height of BMP. Dispose of debris or contaminated sediment at approved locations. Clean sediments may be stabilized onsite using BMPs as approved by Engineer.
- H. Sediment Fence: Remove trapped sediment before it reaches one-third of the above ground fence height and before fence removal.
- I. Initiate repair or replacement of damaged erosion and sediment control BMPs immediately, and work completed by end of next work day. Significant replacement or repair must be completed within 7 days, unless infeasible.
- J. Within 24 hours, remediate any significant sediment that has left construction site. Investigate cause of the sediment release and implement steps to prevent a recurrence of discharge within same 24 hours. Perform in-stream cleanup of sediment according to applicable regulations.
- K. At end of each work day, stabilize or cover soil stockpiles or implement other BMPs to prevent discharges to surface waters or conveyance systems leading to surface waters.

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- L. Temporarily stabilize soils at end of shift before holidays and weekends, if needed. Ensure soils are stable during rain events at all times of year.
- M. Initiate stabilization by no later than end of next work day after construction work in an area has stopped permanently or temporarily.

1.03 REMOVAL

- A. When Engineer determines that an erosion control BMP is no longer required, remove BMP and all associated hardware from the Project limits. When materials are biodegradable, Engineer may approve leaving temporary BMP in place.
- B. Permanently stabilize all bare and disturbed soil after removal of erosion and sediment control BMPs. Dress sediment deposits remaining after BMPs have been removed to conform to existing grade. Prepare and seed graded area. If installation and use of erosion control BMPs have compacted or otherwise rendered soil inhospitable to plant growth, such as construction entrances, take measures to rehabilitate soil to facilitate plant growth. This may include, but is not limited to, ripping the soil, incorporating soil amendments, or seeding with specified seed.

**END OF SECTION**

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**SECTION 01 61 00**  
**COMMON PRODUCT REQUIREMENTS**

**PART 1 GENERAL**

2.01 DEFINITIONS

A. Products:

1. New items for incorporation in the Work, whether purchased by Contractor or Owner for the Project, or taken from previously purchased stock, and may also include existing materials or components required for reuse.
2. Includes the terms material, equipment, machinery, components, subsystem, system, hardware, software, and terms of similar intent and is not intended to change meaning of such other terms used in Contract Documents, as those terms are self-explanatory and have well recognized meanings in construction industry.
3. Items identified by manufacturer's product name, including make or model designation, indicated in manufacturer's published product literature, that is current as of the date of the Contract Documents.

2.02 DESIGN REQUIREMENTS

A. Where Contractor design is specified, design of installation, systems, equipment, and components, including supports and anchorage, shall be in accordance with provisions of latest edition of the Florida Building Code.

1. Wind: Basic wind speed, V: 186 mph, with exposure category C, a Risk Category, IV and an Enclosure category, Enclosure.

2.03 ENVIRONMENTAL REQUIREMENTS

- A. Altitude: Provide materials and equipment suitable for installation and operation under rated conditions at 20 feet above sea level.
- B. Provide equipment and devices installed outdoors or in unheated enclosures capable of continuous operation within an ambient temperature range of 23 degrees F to 104 degrees F.

2.04 PREPARATION FOR SHIPMENT

- A. When practical, factory assemble products. Mark or tag separate parts and assemblies to facilitate field assembly. Cover machined and unpainted parts that may be damaged by the elements with strippable protective coating.
- B. Package products to facilitate handling and protect from damage during shipping, handling, and storage. Mark or tag outside of each package or crate to indicate its purchase order number, bill of lading number, contents by name, name of Project

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and Contractor, equipment number, and approximate weight. Include complete packing list and bill of materials with each shipment.

- C. Extra Materials, Special Tools, Test Equipment, and Expendables:
1. Furnish as required by individual Specifications.
  2. Schedule:
    - a. Ensure that shipment and delivery occurs concurrent with shipment of associated equipment.
    - b. Transfer to Owner shall occur immediately subsequent to Contractor's acceptance of equipment from Supplier.
  3. Packaging and Shipment:
    - a. Package and ship extra materials and special tools to avoid damage during long term storage in original cartons insofar as possible, or in appropriately sized, hinged-cover, wood, plastic, or metal box.
    - b. Prominently displayed on each package, the following:
      - 1) Manufacturer's part nomenclature and number, consistent with Operation and Maintenance Manual identification system.
      - 2) Applicable equipment description.
      - 3) Quantity of parts in package.
      - 4) Equipment manufacturer.
  4. Deliver materials to Site.
  5. Replace extra materials and special tools found to be damaged or otherwise inoperable at time of transfer to Owner.
- D. Request a minimum 7-day advance notice of shipment from manufacturer.
- E. Factory Test Results: Reviewed and accepted by Engineer before product shipment as required in individual Specification sections.

## 2.05 DELIVERY AND INSPECTION

- A. Deliver products in accordance with accepted current Progress Schedule and coordinate to avoid conflict with the Work and conditions at Site. Deliver anchor bolts and templates sufficiently early to permit setting prior to placement of structural concrete.
- B. Deliver products in undamaged condition, in manufacturer's original container or packaging, with identifying labels intact and legible. Include on label, date of manufacture and shelf life, where applicable.
- C. Unload products in accordance with manufacturer's instructions for unloading or as specified. Record receipt of products at Site. Promptly inspect for completeness and evidence of damage during shipment.
- D. Remove damaged products from Site and expedite delivery of identical new undamaged products, and remedy incomplete or lost products to provide that specified, so as not to delay progress of the Work.

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2.06 HANDLING, STORAGE, AND PROTECTION

- A. Handle and store products in accordance with manufacturer's written instructions and in a manner to prevent damage. Store in approved storage yards or sheds provided in accordance with Section 01 50 00, Temporary Facilities and Controls. Provide manufacturer's recommended maintenance during storage, installation, and until products are accepted for use by Owner.
- B. Manufacturer's instructions for material requiring special handling, storage, or protection shall be provided prior to delivery of material.
- C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to ensure that products are maintained under specified conditions, and free from damage or deterioration. Keep running account of products in storage to facilitate inspection and to estimate progress payments for products delivered, but not installed in the Work.
- D. Store electrical, instrumentation, and control products, and equipment with bearings in weather-tight structures maintained above 60 degrees F. Protect electrical, instrumentation, and control products, and insulate against moisture, water, and dust damage. Connect and operate continuously space heaters furnished in electrical equipment.
- E. Store fabricated products above ground on blocking or skids, and prevent soiling or staining. Store loose granular materials in well-drained area on solid surface to prevent mixing with foreign matter. Cover products that are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.
- F. Store finished products that are ready for installation in dry and well-ventilated areas. Do not subject to extreme changes in temperature or humidity.
- G. After installation, provide coverings to protect products from damage due to traffic and construction operations. Remove coverings when no longer needed.
- H. Hazardous Materials: Prevent contamination of personnel, storage area, and Site. Meet requirements of product specification, codes, and manufacturer's instructions.

**PART 2 PRODUCTS**

2.01 GENERAL

- A. Provide manufacturer's standard materials suitable for service conditions, unless otherwise specified in the individual Specifications.
- B. Where product specifications include a named manufacturer, with or without model number, and also include performance requirements, named manufacturer's products must meet the performance specifications.
- C. Like items of products furnished and installed in the Work shall be end products of one manufacturer and of the same series or family of models to achieve standardization for appearance, operation and maintenance, spare parts and

COMMON PRODUCT REQUIREMENTS

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- replacement, manufacturer's services, and implement same or similar process instrumentation and control functions in same or similar manner.
- D. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.
  - E. Provide interchangeable components of the same manufacturer, for similar components, unless otherwise specified.
  - F. Equipment, Components, Systems, and Subsystems: Design and manufacture with due regard for health and safety of operation, maintenance, and accessibility, durability of parts, and shall comply with applicable OSHA, state, and local health and safety regulations.
  - G. Regulatory Requirement: Coating materials shall meet federal, state, and local requirements limiting the emission of volatile organic compounds and for worker exposure.
  - H. Safety Guards: Provide for all belt or chain drives, fan blades, couplings, or other moving or rotary parts. Cover rotating part on all sides. Design for easy installation and removal. Use 16-gauge or heavier; galvanized steel, aluminum coated steel, or galvanized or aluminum coated 1/2-inch mesh expanded steel. Provide galvanized steel accessories and supports, including bolts. For outdoors application, prevent entrance of rain and dripping water.
  - I. Authority Having Jurisdiction (AHJ):
    - 1. Provide the Work in accordance with NFPA 70, National Electrical Code (NEC). Where required by the AHJ, material and equipment shall be labeled or listed by a nationally recognized testing laboratory or other organization acceptable to the AHJ in order to provide a basis for approval under NEC.
    - 2. Materials and equipment manufactured within the scope of standards published by Underwriters Laboratories, Inc. shall conform to those standards and shall have an applied UL listing mark.
  - J. Equipment Finish:
    - 1. Provide manufacturer's standard finish and color, except where specific color is indicated.
    - 2. If manufacturer has no standard color, provide equipment with finish as approved by Owner.
  - K. Special Tools and Accessories: Furnish to Owner, upon acceptance of equipment, all accessories required to place each item of equipment in full operation. These accessory items include, but are not limited to, adequate oil and grease (as required for first lubrication of equipment after field testing), light bulbs, fuses, hydrant wrenches, valve keys, handwheels, chain operators, special tools, and other spare parts as required for maintenance.

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- L. Lubricant: Provide initial lubricant recommended by equipment manufacturer in sufficient quantity to fill lubricant reservoirs and to replace consumption during testing, startup, and operation until final acceptance by Owner.
- M. Components and Materials in Contact with Water for Human Consumption: Comply with the requirements of the Safe Drinking Water Act and other applicable federal, state, and local requirements. Provide certification by manufacturer or an accredited certification organization recognized by the Authority Having Jurisdiction that components and materials comply with the maximum lead content standard in accordance with NSF/ANSI 61 and NSF/ANSI 372.
  - 1. Use or reuse of components and materials without a traceable certification is prohibited.

2.02 FABRICATION AND MANUFACTURE

A. General:

- 1. Manufacture parts to U.S.A. standard sizes and gauges.
- 2. Two or more items of the same type shall be identical, by the same manufacturer, and interchangeable.
- 3. Design structural members for anticipated shock and vibratory loads.
- 4. Use 1/4-inch minimum thickness for steel that will be submerged, wholly or partially, during normal operation.
- 5. Modify standard products as necessary to meet performance Specifications.

B. Lubrication System:

- 1. Require no more than weekly attention during continuous operation.
- 2. Convenient and accessible; oil drains with bronze or stainless steel valves and fill-plugs easily accessible from the normal operating area or platform. Locate drains to allow convenient collection of oil during oil changes without removing equipment from its installed position.
- 3. Provide constant-level oilers or oil level indicators for oil lubrication systems.
- 4. For grease type bearings, which are not easily accessible, provide and install stainless steel tubing; protect and extend tubing to convenient location with suitable grease fitting.

2.03 SOURCE QUALITY CONTROL

- A. Where Specifications call for factory testing to be witnessed by Engineer, notify Engineer not less than 14 days prior to scheduled test date, unless otherwise specified.
- B. Calibration Instruments: Bear the seal of a reputable laboratory certifying instrument has been calibrated within the previous 12 months to a standard endorsed by the National Institute of Standards and Technology (NIST).

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- C. Factory Tests: Perform in accordance with accepted test procedures and document successful completion.

**PART 3 EXECUTION**

3.01 INSPECTION

- A. Inspect materials and equipment for signs of pitting, rust decay, or other deleterious effects of storage. Do not install material or equipment showing such effects. Remove damaged material or equipment from the Site and expedite delivery of identical new material or equipment. Delays to the Work resulting from material or equipment damage that necessitates procurement of new products will be considered delays within Contractor's control.

3.02 MANUFACTURER'S CERTIFICATE OF COMPLIANCE

- A. When so specified, a Manufacturer's Certificate of Compliance, a copy of which is attached to this section, shall be completed in full, signed by entity supplying the product, material, or service, and submitted prior to shipment of product or material or execution of the services.
- B. Engineer may permit use of certain materials or assemblies prior to sampling and testing if accompanied by accepted certification of compliance.
- C. Such form shall certify proposed product, material, or service complies with that specified. Attach supporting reference data, affidavits, and certifications as appropriate.
- D. May reflect recent or previous test results on material or product, if acceptable to Engineer.

3.03 INSTALLATION

- A. Equipment Drawings show general locations of equipment, devices, and raceway, unless specifically dimensioned.
- B. No shimming between machined surfaces is allowed.
- C. Install the Work in accordance with NECA Standard of Installation, unless otherwise specified.
- D. Repaint painted surfaces that are damaged prior to equipment acceptance.
- E. Do not cut or notch any structural member or building surface without specific approval of Engineer.
- F. Handle, install, connect, clean, condition, and adjust products in accordance with manufacturer's instructions, and as may be specified. Retain a copy of manufacturers' instruction at Site, available for review at all times.
- G. For material and equipment specifically indicated or specified to be reused in the Work:
1. Use special care in removal, handling, storage, and reinstallation to assure proper function in the completed Work.

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2. Arrange for transportation, storage, and handling of products that require offsite storage, restoration, or renovation. Include costs for such Work in the Contract Price.

3.04 FIELD FINISHING

- A. In accordance with Section 09 90 00, Painting and Coating, and individual Specification sections.

3.05 ADJUSTMENT AND CLEANING

- A. Perform required adjustments, tests, operation checks, and other startup activities.

3.06 LUBRICANTS

- A. Fill lubricant reservoirs and replace consumption during testing, startup, and operation prior to acceptance of equipment by Owner.

3.07 SUPPLEMENTS

- A. The supplement listed below, following “End of Section”, is part of this specification.
  1. Form: Manufacturer’s Certificate of Compliance.

**END OF SECTION**

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**MANUFACTURER’S CERTIFICATE OF COMPLIANCE**

OWNER: \_\_\_\_\_ PRODUCT, MATERIAL, OR SERVICE  
PROJECT NAME: \_\_\_\_\_ SUBMITTED: \_\_\_\_\_  
PROJECT NO: \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I hereby certify that the above-referenced product, material, or service called for by the Contract for the named Project will be furnished in accordance with all applicable requirements. I further certify that the product, material, or service are of the quality specified and conform in all respects with the Contract requirements, and are in the quantity shown.

Date of Execution: \_\_\_\_\_, 20\_\_

Manufacturer: \_\_\_\_\_

Manufacturer’s Authorized Representative (*print*): \_\_\_\_\_

\_\_\_\_\_  
(Authorized Signature)

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**SECTION 01 77 00  
CLOSEOUT PROCEDURES**

**PART 1 GENERAL**

1.01 SUBMITTALS

A. Informational Submittals:

1. Submit prior to application for final payment.
  - a. Record Documents: As required in General Conditions.
  - b. Approved Shop Drawings and Samples: As required in the General Conditions.
  - c. Special bonds, Special Guarantees, and Service Agreements.
  - d. Consent of Surety to Final Payment: As required in General Conditions.
  - e. Releases or Waivers of Liens and Claims: As required in General Conditions.
  - f. Releases from Agreements.
  - g. Final Application for Payment: Submit in accordance with procedures and requirements stated in Section 01 29 00, Payment Procedures.
  - h. Extra Materials: As required by individual Specification sections.

1.02 RECORD DOCUMENTS

A. Quality Assurance:

1. Furnish qualified and experienced person, whose duty and responsibility shall be to maintain record documents.
2. Accuracy of Records:
  - a. Coordinate changes within record documents, making legible and accurate entries on each sheet of Drawings and other documents where such entry is required to show change.
  - b. Purpose of Project record documents is to document factual information regarding aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive Site measurement, investigation, and examination.
3. Make entries within 24 hours after receipt of information that a change in the Work has occurred.

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4. Prior to submitting each request for progress payment, request Engineer's review and approval of current status of record documents. Failure to properly maintain, update, and submit record documents may result in a deferral by Engineer to recommend whole or any part of Contractor's Application for Payment, either partial or final.

1.03 RELEASES FROM AGREEMENTS

- A. Furnish Owner written releases from property owners or public agencies where side agreements or special easements have been made, or where Contractor's operations have not been kept within the Owner's construction right-of-way.
- B. In the event Contractor is unable to secure written releases:
  1. Inform Owner of the reasons.
  2. Owner or its representatives will examine the Site, and Owner will direct Contractor to complete the Work that may be necessary to satisfy terms of the side agreement or special easement.
  3. Should Contractor refuse to perform this Work, Owner reserves right to have it done by separate contract and deduct cost of same from Contract Price, or require Contractor to furnish a satisfactory bond in a sum to cover legal Claims for damages.
  4. When Owner is satisfied that the Work has been completed in agreement with Contract Documents and terms of side agreement or special easement, right is reserved to waive requirement for written release if: (i) Contractor's failure to obtain such statement is due to grantor's refusal to sign, and this refusal is not based upon any legitimate Claims that Contractor has failed to fulfill terms of side agreement or special easement, or (ii) Contractor is unable to contact or has had undue hardship in contacting grantor.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION**

3.01 MAINTENANCE OF RECORD DOCUMENTS

- A. General:
  1. Promptly following commencement of Contract Times, secure from Engineer at no cost to Contractor, one complete set of Contract Documents. Drawings will be full size.
  2. Label or stamp each record document with title, "RECORD DOCUMENTS," in neat large printed letters.
  3. Record information concurrently with construction progress and within 24 hours after receipt of information that change has occurred. Do not cover or conceal Work until required information is recorded.
- B. Preservation:

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1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
2. Make documents and Samples available at all times for observation by Engineer.

C. Making Entries on Drawings:

1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.
  - a. Color Coding:
    - 1) Green when showing information deleted from Drawings.
    - 2) Red when showing information added to Drawings.
    - 3) Blue and circled in blue to show notes.
2. Date entries.
3. Call attention to entry by “cloud” drawn around area or areas affected.
4. Legibly mark to record actual changes made during construction, including, but not limited to:
  - a. Depths of various elements of foundation in relation to finished first floor data if not shown or where depth differs from that shown.
  - b. Horizontal and vertical locations of existing and new Underground Facilities and appurtenances, and other underground structures, equipment, or Work. Reference to at least two measurements to permanent surface improvements.
  - c. Location of internal utilities and appurtenances concealed in the construction referenced to visible and accessible features of the structure.
  - d. Locate existing facilities, piping, equipment, and items critical to the interface between existing physical conditions or construction and new construction.
  - e. Changes made by Addenda and Field Orders, Work Change Directive, Change Order, and Engineer’s written interpretation and clarification using consistent symbols for each and showing appropriate document tracking number.
5. Dimensions on Schematic Layouts: Show on record drawings, by dimension, the centerline of each run of items such as are described in previous subparagraph above.
  - a. Clearly identify the item by accurate note such as “cast iron drain,” “galv. water,” and the like.
  - b. Show, by symbol or note, vertical location of item (“under slab,” “in ceiling plenum,” “exposed,” and the like).
  - c. Make identification so descriptive that it may be related reliably to Specifications.

3.02 FINAL CLEANING

- A. At completion of the Work or of a part thereof and immediately prior to Contractor’s request for certificate of Substantial Completion; or if no certificate

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is issued, immediately prior to Contractor's notice of completion, clean entire Site or parts thereof, as applicable.

1. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to Owner and Engineer.
  2. Remove grease, dirt, dust, paint or plaster splatter, stains, labels, fingerprints, and other foreign materials from exposed surfaces.
  3. Repair, patch, and touch up marred surfaces to specified finish and match adjacent surfaces.
  4. Clean all windows.
  5. Clean and wax wood, vinyl, or painted floors.
  6. Broom clean exterior paved driveways and parking areas.
  7. Hose clean sidewalks, loading areas, and others contiguous with principal structures.
  8. Rake clean all other surfaces.
  9. Remove snow and ice from access to buildings.
  10. Replace air-handling filters and clean ducts, blowers, and coils of ventilation units operated during construction.
  11. Leave water courses, gutters, and ditches open and clean.
- B. Use only cleaning materials recommended by manufacturer of surfaces to be cleaned.

**END OF SECTION**

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**SECTION 01 78 23**  
**OPERATION AND MAINTENANCE DATA**

**PART 1 GENERAL**

1.01 SECTION INCLUDES

- A. Detailed information for the preparation, submission, and Engineer's review of Operations and Maintenance (O&M) Data, as required by individual Specification sections.

1.02 DEFINITIONS

- A. Preliminary Data: Initial and subsequent submissions for Engineer's review.
- B. Final Data: Engineer-accepted data, submitted as specified herein.
- C. Maintenance Operation: As used on Maintenance Summary Form is defined to mean any routine operation required to ensure satisfactory performance and longevity of equipment. Examples of typical maintenance operations are lubrication, belt tensioning, adjustment of pump packing glands, and routine adjustments.

1.03 SEQUENCING AND SCHEDULING

- A. Equipment and System Data:
  - 1. Preliminary Data:
    - a. Do not submit until Shop Drawing for equipment or system has been reviewed and approved by Engineer.
    - b. Submit prior to shipment date.
  - 2. Final Data: Submit Instructional Manual Formatted data not less than 30 days prior to installation of equipment or system.
- B. Materials and Finishes Data:
  - 1. Preliminary Data: Submit at least 15 days prior to request for final inspection.
  - 2. Final Data: Submit within 10 days after final inspection.

1.04 DATA FORMAT

- A. Prepare preliminary and final data in the form of an instructional manual. Prepare final data on electronic media.

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B. Instructional Manual Format:

1. Binder: Commercial quality, permanent, three-ring or three-post binders with durable plastic cover.
2. Size: 8-1/2 inches by 11 inches, minimum.
3. Cover: Identify manual with typed or printed title "OPERATION AND MAINTENANCE DATA" and list:
  - a. Project title.
  - b. Designate applicable system, equipment, material, or finish.
  - c. Identity of separate structure as applicable.
  - d. Identify volume number if more than one volume.
4. Spine:
  - a. Project title.
  - b. Identify volume number if more than one volume.
5. Title Page:
  - a. Contractor name, address, and telephone number.
  - b. Subcontractor, Supplier, installer, or maintenance contractor's name, address, and telephone number, as appropriate.
    - 1) Identify area of responsibility of each.
    - 2) Provide name and telephone number of local source of supply for parts and replacement.
6. Table of Contents:
  - a. Neatly typewritten and arranged in systematic order with consecutive page numbers.
  - b. Identify each product by product name and other identifying numbers or symbols as set forth in Contract Documents.
7. Paper: 20-pound minimum, white for typed pages.
8. Text: Manufacturer's printed data, or neatly typewritten.
9. Three-hole punch data for binding and composition; arrange printing so that punched holes do not obliterate data.
10. Material shall be suitable for reproduction, with quality equal to original. Photocopying of material will be acceptable, except for material containing photographs. High quality copies of photographs are acceptable. Color copies must be provided for color photographs.

C. Data Compilation Format:

1. Compile all Engineer-accepted preliminary O&M data into a hard-copy, hard-bound set.
2. Each set shall consist of the following:
  - a. Binder: Commercial quality, permanent, three-ring or three-post binders with durable plastic cover.
  - b. Cover: Identify each volume with typed or printed title "OPERATION AND MAINTENANCE DATA, VOLUME NO. \_\_\_\_ OF \_\_\_\_", and list:
    - 1) Project title.

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- 2) Contractor's name, address, and telephone number.
- 3) If entire volume covers equipment or system provided by one Supplier include the following:
  - a) Identity of general subject matter covered in manual.
  - b) Identity of equipment number and Specification section.
- c. Provide each volume with title page and typed table of contents with consecutive page numbers. Place contents of entire set, identified by volume number, in each binder.
- d. Table of contents neatly typewritten, arranged in a systematic order:
  - 1) Include list of each product, indexed to content of each volume.
  - 2) Designate system or equipment for which it is intended.
  - 3) Identify each product by product name and other identifying numbers or symbols as set forth in Contract Documents.
- e. Section Dividers:
  - 1) Heavy, 80 pound cover weight, tabbed with numbered plastic index tabs.
  - 2) Fly-Leaf:
    - a) For each separate product, or each piece of operating equipment, with typed description of product and major component parts of equipment.
    - b) List with Each Product:
      - (1) Name, address, and telephone number of Subcontractor, Supplier, installer, and maintenance contractor, as appropriate.
      - (2) Identify area of responsibility of each.
      - (3) Provide local source of supply for parts and replacement.
    - c) Identity of separate structure as applicable.
- f. Assemble and bind material, as much as possible, in same order as specified in the Contract Documents.

D. Electronic Media Format:

1. Portable Document Format (PDF):
  - a. After all preliminary data has been found to be acceptable to Engineer, submit Operation and Maintenance data in PDF format on CD.
  - b. Files to be exact duplicates of Engineer-accepted preliminary data. Arrange by specification number and name.
  - c. Files to be fully functional and viewable in most recent version of Adobe Acrobat.
2. Manufacturers' standard electronic format.

1.05 SUBMITTALS

A. Informational:

OPERATION AND MAINTENANCE DATA

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CAM # 19-0775

Exhibit # 1

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1. Data Outline: Submit two copies of a detailed outline of proposed organization and contents of Final Data prior to preparation of Preliminary Data.
2. Preliminary Data:
  - a. Submit three copies for Engineer's review.
  - b. If data meets conditions of the Contract:
    - 1) One copy will be returned to Contractor.
    - 2) One copy will be forwarded to Resident Project Representative.
    - 3) One copy will be retained in Engineer's file.
  - c. If data does not meet conditions of the Contract:
    - 1) All copies will be returned to Contractor with Engineer's comments (on separate document) for revision.
    - 2) Engineer's comments will be retained in Engineer's file.
    - 3) Resubmit two copies revised in accordance with Engineer's comments.
3. Final Data: Submit two copies in format specified herein.

#### 1.06 DATA FOR EQUIPMENT AND SYSTEMS

##### A. Content For Each Unit (or Common Units) and System:

1. Product Data:
  - a. Include only those sheets that are pertinent to specific product.
  - b. Clearly annotate each sheet to:
    - 1) Identify specific product or part installed.
    - 2) Identify data applicable to installation.
    - 3) Delete references to inapplicable information.
  - c. Function, normal operating characteristics, and limiting conditions.
  - d. Performance curves, engineering data, nameplate data, and tests.
  - e. Complete nomenclature and commercial number of replaceable parts.
  - f. Original manufacturer's parts list, illustrations, detailed assembly drawings showing each part with part numbers and sequentially numbered parts list, and diagrams required for maintenance.
  - g. Spare parts ordering instructions.
  - h. Where applicable, identify installed spares and other provisions for future work (e.g., reserved panel space, unused components, wiring, terminals).
2. As-installed, color-coded piping diagrams.
3. Charts of valve tag numbers, with the location and function of each valve.
4. Drawings: Supplement product data with Drawings as necessary to clearly illustrate:
  - a. Format:
    - 1) Provide reinforced, punched, binder tab; bind in with text.
    - 2) Reduced to 8-1/2 inches by 11 inches, or 11 inches by 17 inches folded to 8-1/2 inches by 11 inches.

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- 3) Where reduction is impractical, fold and place in 8-1/2-inch by 11-inch envelopes bound in text.
- 4) Identify Specification section and product on Drawings and envelopes.
- b. Relations of component parts of equipment and systems.
- c. Control and flow diagrams.
- d. Coordinate drawings with Project record documents to assure correct illustration of completed installation.
5. Instructions and Procedures: Within text, as required to supplement product data.
  - a. Format:
    - 1) Organize in consistent format under separate heading for each different procedure.
    - 2) Provide logical sequence of instructions for each procedure.
    - 3) Provide information sheet for Owner's personnel, including:
      - a) Proper procedures in event of failure.
      - b) Instances that might affect validity of guarantee or Bond.
  - b. Installation Instructions: Including alignment, adjusting, calibrating, and checking.
  - c. Operating Procedures:
    - 1) Startup, break-in, routine, and normal operating instructions.
    - 2) Test procedures and results of factory tests where required.
    - 3) Regulation, control, stopping, and emergency instructions.
    - 4) Description of operation sequence by control manufacturer.
    - 5) Shutdown instructions for both short and extended duration.
    - 6) Summer and winter operating instructions, as applicable.
    - 7) Safety precautions.
    - 8) Special operating instructions.
  - d. Maintenance and Overhaul Procedures:
    - 1) Routine maintenance.
    - 2) Guide to troubleshooting.
    - 3) Disassembly, removal, repair, reinstallation, and re-assembly.
6. Guarantee, Bond, and Service Agreement: In accordance with Section 01 77 00, Closeout Procedures.

B. Content for Each Electric or Electronic Item or System:

1. Description of Unit and Component Parts:
  - a. Function, normal operating characteristics, and limiting conditions.
  - b. Performance curves, engineering data, nameplate data, and tests.
  - c. Complete nomenclature and commercial number of replaceable parts.
  - d. Interconnection wiring diagrams, including control and lighting systems.
2. Circuit Directories of Panelboards:
3. Electrical service.
4. Control requirements and interfaces.

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5. Communication requirements and interfaces.
6. List of electrical relay settings, and control and alarm contact settings.
7. Electrical interconnection wiring diagram, including as applicable, single-line, three-line, schematic and internal wiring, and external interconnection wiring.
8. As-installed control diagrams by control manufacturer.
9. Operating Procedures:
  - a. Routine and normal operating instructions.
  - b. Startup and shutdown sequences, normal and emergency.
  - c. Safety precautions.
  - d. Special operating instructions.
10. Maintenance Procedures:
  - a. Routine maintenance.
  - b. Guide to troubleshooting.
  - c. Adjustment and checking.
  - d. List of relay settings, control and alarm contact settings.
11. Manufacturer's printed operating and maintenance instructions.
12. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

C. Maintenance Summary:

1. Compile individual Maintenance Summary for each applicable equipment item, respective unit or system, and for components or sub-units.
2. Format:
  - a. Use Maintenance Summary Form bound with this section or electronic facsimile of such.
  - b. Each Maintenance Summary may take as many pages as required.
  - c. Use only 8-1/2-inch by 11-inch size paper.
  - d. Complete using typewriter or electronic printing.
3. Include detailed lubrication instructions and diagrams showing points to be greased or oiled; recommend type, grade, and temperature range of lubricants and frequency of lubrication.
4. Recommended Spare Parts:
  - a. Data to be consistent with manufacturer's Bill of Materials/Parts List furnished in O&M manuals.
  - b. "Unit" is the unit of measure for ordering the part.
  - c. "Quantity" is the number of units recommended.
  - d. "Unit Cost" is the current purchase price.

1.07 DATA FOR MATERIALS AND FINISHES

A. Content for Architectural Products, Applied Materials, and Finishes:

1. Manufacturer's data, giving full information on products:
  - a. Catalog number, size, and composition.
  - b. Color and texture designations.

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- c. Information required for reordering special-manufactured products.
  2. Instructions for Care and Maintenance:
    - a. Manufacturer's recommendation for types of cleaning agents and methods.
    - b. Cautions against cleaning agents and methods that are detrimental to product.
    - c. Recommended schedule for cleaning and maintenance.
- B. Content for Moisture Protection and Weather Exposed Products:
  1. Manufacturer's data, giving full information on products:
    - a. Applicable standards.
    - b. Chemical composition.
    - c. Details of installation.
  2. Instructions for inspection, maintenance, and repair.

1.08 SUPPLEMENTS

- A. The supplements listed below, following "End of Section", are part of this Specification.
  1. Forms: Maintenance Summary Form.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**

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MAINTENANCE SUMMARY FORM

PROJECT: \_\_\_\_\_ CONTRACT NO.: \_\_\_\_\_

1. EQUIPMENT ITEM \_\_\_\_\_

2. MANUFACTURER \_\_\_\_\_

3. EQUIPMENT/TAG NUMBER(S) \_\_\_\_\_

4. WEIGHT OF INDIVIDUAL COMPONENTS (OVER 100 POUNDS) \_\_\_\_\_

5. NAMEPLATE DATA (hp, voltage, speed, etc.) \_\_\_\_\_

6. MANUFACTURER'S LOCAL REPRESENTATIVE \_\_\_\_\_

a. Name \_\_\_\_\_ Telephone No. \_\_\_\_\_

b. Address \_\_\_\_\_

7. MAINTENANCE REQUIREMENTS

Maintenance Operation Comments	Frequency	Lubricant (If Applicable)
List briefly each maintenance operation required and refer to specific information in manufacturer's standard maintenance manual, if applicable. (Reference to manufacturer's catalog or sales literature is not acceptable.)	List required frequency of each maintenance operation.	Refer by symbol to lubricant required.



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**SECTION 01 88 15**  
**ANCHORAGE AND BRACING**

**PART 1 GENERAL**

1.01 SUMMARY

- A. This section covers requirements for anchorage and bracing of equipment, distribution systems, and other nonstructural components required in accordance with the Florida Building Code (6<sup>th</sup> Edition), for seismic, wind, gravity, soil, and operational loads.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Institute of Steel Construction (AISC) 360, Specification for Structural Steel Buildings.
  2. American Society of Civil Engineers (ASCE): ASCE 7, Minimum Design Loads for Buildings and Other Structures.
  3. International Code Council (ICC): International Building Code (IBC).
  4. State of Florida Building Code.

1.03 DEFINITIONS

- A. Authority Having Jurisdiction (AHJ): Permitting building agency; may be a federal, state, local, or other regional department, or individual including building official, fire chief, fire marshal, chief of a fire prevention bureau, labor department, or health department, electrical inspector; or others having statutory authority. AHJ may be Owner when authorized to be self-permitting by governmental permitting agency or when no governmental agency has authority.
- B. Designated Seismic System: Architectural, electrical, and mechanical system or their components for which component importance factor is greater than 1.0.

1.04 DESIGN AND PERFORMANCE REQUIREMENTS

- A. General:
1. Anchorage and bracing systems shall be designed by a qualified professional engineer registered in the State of Florida.

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2. Design anchorage and bracing of architectural, mechanical, and electrical components and systems in accordance with this section, unless a design is specifically provided within Contract Documents or where exempted hereinafter.
3. Design attachments, braces, and anchors for equipment, components, and distribution systems to structure for gravity, seismic, wind, and operational loading.
4. Design seismic anchorage and bracing for modified existing architectural, mechanical, or electrical systems where code requirements would dictate design for similar new components.
5. Anchor and brace piping and ductwork, whether exempt or not exempt for this section, so that lateral or vertical displacement does not result in damage or failure to essential architectural, mechanical, or electrical equipment.
6. Architectural Components: Includes, but are not limited to, nonstructural walls and elements, partitions, cladding and veneer, access flooring, signs, cabinets, suspended ceilings, and glass in glazed curtain walls and partitions.
7. Provide supplementary framing where required to transfer anchorage and bracing loads to structure.
8. Adjust equipment pad sizes or provide additional anchorage confinement reinforcing to provide required anchorage capacities.
9. Anchor existing equipment as noted on Drawings.
10. Design anchorage and bracing for:
  - a. Equipment and components that weigh more than 400 pounds and are mounted 4 feet or less above adjacent finished floor.
11. For components exempted from design requirements of this section, provide bolted, welded, or otherwise positively fastened attachments to supporting structure.

B. Design Loads:

1. Gravity: Design anchorage and bracing for self-weight and superimposed loads on components and equipment.
2. Wind: Design anchorage and bracing for wind criteria provided on General Structural Notes on Drawings for exposed architectural components and exterior and wind-exposed mechanical and electrical equipment. Alternately, manufacturer certification may be provided for components such as roofing and flashing to verify attachments meet Project-specific design criteria.
3. Operational:
  - a. For loading supplied by equipment manufacturer for IBC required load cases.
  - b. Loads may include equipment vibration, torque, thermal effects, effects of internal contents (weight and sloshing), water hammer, and other load-inducing conditions.

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- c. Locate braces to minimize vibration to or movement of structure.
- 4. Seismic: Category.

## 1.05 SUBMITTALS

### A. Action Submittals:

- 1. Shop Drawings:
  - a. List of architectural, mechanical, and electrical equipment requiring Contractor-designed anchorage and bracing, unless specifically exempted.
  - b. Manufacturers' engineered seismic and non-seismic hardware product data.
  - c. Attachment assemblies' drawings including seismic attachments; include connection hardware, braces, and anchors or anchor bolts for nonexempt components, equipment, and systems.
  - d. Submittal will be rejected if proposed anchorage method would create excessive stress to supporting member. Revise anchorages and strengthen structural support to eliminate overstressed condition.

### B. Informational Submittals:

- 1. Anchorage and Bracing Calculations: For attachments, braces, and anchorages, include IBC and Project-specific criteria as noted on General Structural Notes on Drawings, in addition to manufacturer's specific criteria used for design; sealed by a civil or structural engineer registered in the State of Florida.
- 2. Manufacturer's hardware installation requirements.

## PART 2 PRODUCTS

### 2.01 GENERAL

- A. Design and construct attachments and supports transferring seismic and non-seismic loads to structure of materials and products suitable for application and in accordance with design criteria shown on Drawings and nationally recognized standards.
- B. Provide anchor bolts for anchorage of equipment to concrete or masonry in accordance with Section 05 50 00, Metal Fabrications. Provide anchor bolts of the size, minimum embedment, and spacing designated in calculations submitted by Contractor and accepted by Engineer.

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- C. Provide post-installed concrete and masonry anchors for anchorage of equipment to concrete or masonry in accordance with Section 05 05 19, Post-Installed Anchors. Provide post-installed anchors of the size, minimum embedment, and spacing designated in calculations submitted by Contractor and accepted by Engineer.
- D. Do not use powder-actuated fasteners or sleeve anchors for seismic attachments and anchorage where resistance to tension loads is required. Do not use expansion anchors, other than undercut anchors, for non-vibration isolated mechanical equipment rated over 10 horsepower.

### **PART 3 EXECUTION**

#### **3.01 GENERAL**

- A. Make attachments, bracing, and anchorage in such a manner that component lateral force is transferred to lateral force resisting system of structure through a complete load path.
- B. Design, provide, and install overall seismic anchorage system to provide restraint in all directions, including vertical, for each component or system so anchored.
- C. Provide snubbers in each horizontal direction and vertical restraints for components mounted on vibration isolation systems where required to resist overturning.
- D. Provide piping anchorage that maintains design flexibility and expansion capabilities at flexible connections and expansion joints.
- E. Anchor tall and narrow equipment such as motor control centers and telemetry equipment at base and within 12 inches from top of equipment, unless approved otherwise by Engineer.
- F. Do not attach architectural, mechanical, or electrical components to more than one element of a building structure at a single restraint location where such elements may respond differently during a seismic event. Do not make such attachments across building expansion and contraction joints.

#### **3.02 INSTALLATION**

- A. Do not install components or their anchorages or restraints prior to review and acceptance by Engineer and AHJ.

**END OF SECTION**

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**SECTION 01 91 14**  
**EQUIPMENT TESTING AND FACILITY STARTUP****PART 1 GENERAL**

## 1.01 DEFINITIONS

- A. Facility: Entire Project, or an agreed-upon portion, including all of its unit processes.
- B. Functional Test: Test or tests in presence of Engineer and Owner to demonstrate that installed equipment meets manufacturer's installation, calibration, and adjustment requirements and other requirements as specified.
- C. Performance Test: Test or tests performed after any required functional test in presence of Engineer and Owner to demonstrate and confirm individual equipment meets performance requirements specified in individual sections.
- D. Unit Process: As used in this section, a unit process is a portion of the facility that performs a specific process function, such as clean-in-place chemical system.
- E. Facility Performance Demonstration:
  - 1. A demonstration, conducted by Contractor, with assistance of Owner, to demonstrate and document the performance of the entire operating facility, both manually and automatically (if required), based on criteria developed in conjunction with Owner and as accepted by Engineer.
  - 2. Such demonstration is for the purposes of (i) verifying to Owner entire facility performs as a whole, and (ii) documenting performance characteristics of completed facility for Owner's records. Neither the demonstration nor the evaluation is intended in any way to make performance of a unit process or entire facility the responsibility of Contractor, unless such performance is otherwise specified.

## 1.02 SUBMITTALS

- A. Informational Submittals:
  - 1. Facility Startup and Performance Demonstration Plan.
  - 2. Functional and performance test results.
  - 3. Completed Unit Process Startup Form for each unit process.
  - 4. Completed Facility Performance Demonstration/Certification Form.

## 1.03 FACILITY STARTUP AND PERFORMANCE DEMONSTRATION PLAN

- A. Develop a written plan, in conjunction with Owner's operations personnel; to include the following:

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1. Step-by-step instructions for startup of each unit process and the complete facility.
2. Unit Process Startup Form (sample attached), to minimally include the following:
  - a. Description of the unit process, including equipment numbers/nomenclature of each item of equipment and all included devices.
  - b. Detailed procedure for startup of the unit process, including valves to be opened/closed, order of equipment startup, etc.
  - c. Startup requirements for each unit process, including water, power, chemicals, etc.
  - d. Space for evaluation comments.
3. Facility Performance Demonstration/Certification Form (sample attached), to minimally include the following:
  - a. Description of unit processes included in the facility startup.
  - b. Sequence of unit process startup to achieve facility startup.
  - c. Description of computerized operations, if any, included in the facility.
  - d. Contractor certification facility is capable of performing its intended function(s), including fully automatic operation.
  - e. Signature spaces for Contractor and Engineer.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION**

3.01 GENERAL

- A. Facility Startup Meetings: Schedule, in accordance with requirements of Section 01 31 19, Project Meetings, to discuss test schedule, test methods, materials, chemicals and liquids required, facilities operations interface, and Owner involvement.
- B. Contractor's Testing and Startup Representative:
  1. Designate and furnish one or more personnel to coordinate and expedite testing and facility startup.
  2. Representative(s) shall be present during startup meetings and shall be available at all times during testing and startup.
- C. Provide temporary valves, gauges, piping, test equipment and other materials and equipment required for testing and startup.
- D. Provide Subcontractor and equipment manufacturers' staff adequate to prevent delays. Schedule ongoing work so as not to interfere with or delay testing and startup.

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## E. Owner will:

1. Provide water, power and other items as required for startup, unless otherwise indicated.
2. Operate process units and facility with support of Contractor.
3. Provide labor and materials as required for laboratory analyses.

## 3.02 EQUIPMENT TESTING

## A. Preparation:

1. Complete installation before testing.
2. Furnish qualified manufacturers' representatives, when required by individual Specification sections.
3. Obtain and submit from equipment manufacturer's representative Manufacturer's Certificate of Proper Installation Form, in accordance with Section 01 43 33, Manufacturers' Field Services, when required by individual Specification sections.
4. Equipment Test Report Form: Provide written test report for each item of equipment to be tested, to include the minimum information:
  - a. Owner/Project Name.
  - b. Equipment or item tested.
  - c. Date and time of test.
  - d. Type of test performed (Functional or Performance).
  - e. Test method.
  - f. Test conditions.
  - g. Test results.
  - h. Signature spaces for Contractor and Engineer as witness.
5. Cleaning and Checking: Prior to beginning functional testing:
  - a. Calibrate testing equipment in accordance with manufacturer's instructions.
  - b. Inspect and clean equipment, devices, connected piping, and structures to ensure they are free of foreign material.
  - c. Lubricate equipment in accordance with manufacturer's instructions.
  - d. Turn rotating equipment by hand when possible to confirm that equipment is not bound.
  - e. Open and close valves by hand and operate other devices to check for binding, interference, or improper functioning.
  - f. Check power supply to electric-powered equipment for correct voltage.
  - g. Adjust clearances and torque.
  - h. Test piping for leaks.
6. Ready-to-test determination will be by Engineer based at least on the following:
  - a. Acceptable Operation and Maintenance Data.
  - b. Notification by Contractor of equipment readiness for testing.

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- c. Receipt of Manufacturer's Certificate of Proper Installation, if so specified.
- d. Adequate completion of work adjacent to, or interfacing with, equipment to be tested.
- e. Availability and acceptability of manufacturer's representative, when specified, to assist in testing of respective equipment.
- f. Satisfactory fulfillment of other specified manufacturer's responsibilities.
- g. Equipment and electrical tagging complete.
- h. Delivery of all spare parts and special tools.

B. Functional Testing:

- 1. Conduct as specified in individual Specification sections.
- 2. Notify Owner and Engineer in writing at least 10 days prior to scheduled date of testing.
- 3. Prepare Equipment Test Report summarizing test method and results.
- 4. When, in Engineer's opinion, equipment meets functional requirements specified, such equipment will be accepted for purposes of advancing to performance testing phase, if so required by individual Specification sections. Such acceptance will be evidenced by Engineer/Owner's signature as witness on Equipment Test Report.

C. Performance Testing:

- 1. Conduct as specified in individual Specification sections.
- 2. Notify Engineer and Owner in writing at least 10 days prior to scheduled date of test.
- 3. Performance testing shall not commence until equipment has been accepted by Engineer as having satisfied functional test requirements specified.
- 4. Type of fluid, gas, or solid for testing shall be as specified.
- 5. Unless otherwise indicated, furnish labor, materials, and supplies for conducting the test and taking samples and performance measurements.
- 6. Prepare Equipment Test Report summarizing test method and results.
- 7. When, in Engineer's opinion, equipment meets performance requirements specified, such equipment will be accepted as to conforming to Contract requirements. Such acceptance will be evidenced by Engineer's signature on Equipment Test Report.

3.03 STARTUP OF UNIT PROCESSES

- A. Prior to unit process startup, equipment within unit process shall be accepted by Engineer as having met functional and performance testing requirements specified.
- B. Make adjustments, repairs, and corrections necessary to complete unit process startup.

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- C. Startup shall be considered complete when, in opinion of Engineer, unit process has operated in manner intended for one complete cleaning cycle without significant interruption. This period is in addition to functional or performance test periods specified elsewhere.
- D. Significant Interruption: May include any of the following events:
  - 1. Failure of Contractor to provide and maintain qualified onsite startup personnel as scheduled.
  - 2. Failure to meet specified functional operation Failure of any critical equipment or unit process that is not satisfactorily corrected with-in 5 hours after failure.
  - 3. Failure of any noncritical equipment or unit process that is not satisfactorily corrected within 8 hours after failure.
  - 4. As determined by Engineer.
- E. A significant interruption will require startup then in progress to be stopped. After corrections are made, startup test period to start from beginning again.

3.04 FACILITY PERFORMANCE DEMONSTRATION

- A. When, in the opinion of Engineer, startup of all unit processes has been achieved, sequence each unit process to the point that facility is operational.
- B. Demonstrate proper operation of required interfaces within and between individual unit processes.
- C. After facility is operating, complete performance testing of equipment and systems not previously tested.
- D. Certify, on the Facility Performance Demonstration/Certification Form, that facility is capable of performing its intended function(s), including fully automatic operation.

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3.05 SUPPLEMENTS

A. Supplements listed below, following “End of Section,” are a part of this Specification:

1. Unit Process Startup Form.
2. Facility Performance Demonstration/Certification Form.

**END OF SECTION**

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### UNIT PROCESS STARTUP FORM

**OWNER:** \_\_\_\_\_ **PROJECT:** \_\_\_\_\_

**Unit Process Description: (Include description and equipment number of all equipment and devices):**

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**Startup Procedure (Describe procedure for sequential startup and evaluation, including valves to be opened/closed, order of equipment startup, etc.):**

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**Startup Requirements (Water, power, chemicals, etc.):** \_\_\_\_\_

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---

**Evaluation Comments:** \_\_\_\_\_

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**FACILITY PERFORMANCE DEMONSTRATION/CERTIFICATION FORM**

**OWNER:** \_\_\_\_\_ **PROJECT:** \_\_\_\_\_

**Unit Processes Description (List unit processes involved in facility startup):**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Unit Processes Startup Sequence (Describe sequence for startup, including computerized operations, if any):**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Contractor Certification that Facility is capable of performing its intended function(s), including fully automatic operation:**

**Contractor:** \_\_\_\_\_ **Date:** \_\_\_\_\_, 20\_\_

**Engineer:** \_\_\_\_\_ **Date:** \_\_\_\_\_, 20\_\_  
(Authorized Signature)

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**SECTION 05 05 19**  
**POST-INSTALLED ANCHORS****PART 1 GENERAL**

## 1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Concrete Institute (ACI):
    - a. 318, Building Code Requirements for Structural Concrete.
    - b. 355.2, Qualification of Post-Installed Mechanical Anchors in Concrete.
    - c. 355.4, Qualification of Post-Installed Adhesive Anchors in Concrete.
  2. American Iron and Steel Institute (AISI): Stainless Steel Type 316.
  3. American National Standards Institute (ANSI).
  4. ASTM International (ASTM):
    - a. A123/A123M, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
    - b. A143, Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
    - c. A153/A153M, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
    - d. A193/A193M, Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
    - e. A194/A194M, Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both.
    - f. A380, Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems.
    - g. A385, Practice for Providing High-Quality Zinc Coatings (Hot-Dip).
    - h. A563, Specification for Carbon and Alloy Steel Nuts.
    - i. A780, Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
    - j. A967, Specification for Chemical Passivation Treatments for Stainless Steel Parts.
    - k. E488, Standard Test Methods for Strength of Anchors in Concrete Elements.
    - l. F436, Specification for Hardened Steel Washers.
    - m. F468, Specification for Nonferrous Bolts, Hex Cap Screws, and Studs for General Use.
    - n. F568M, Specification for Carbon and Alloy Steel Externally Threaded Metric Fasteners.
    - o. F593, Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
    - p. F594, Specification for Stainless Steel Nuts.

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- q. F1554, Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
- 5. International Code Council Evaluation Service (ICC-ES):
  - a. Evaluation Reports for Concrete.
  - b. AC70, Acceptance Criteria for Fasteners Power-driven into Concrete, Steel and Masonry Elements.
  - c. AC193, Acceptance Criteria for Mechanical Anchors in Concrete Elements.
  - d. AC308, Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements. Evaluation Reports for Concrete and Masonry Anchors.
- 6. NSF International (NSF): 61, Drinking Water System Components - Health Effects.
- 7. Specialty Steel Industry of North America (SSINA):
  - a. Specifications for Stainless Steel.
  - b. Design Guidelines for the Selection and Use of Stainless Steel.
  - c. Stainless Steel Fabrication.
  - d. Stainless Steel Fasteners.

## 1.02 DEFINITIONS

- A. Corrosive Area: Containment area or area exposed to delivery, storage, transfer, or use of chemicals.
- B. Exterior Area: Location not protected from weather by a building or other enclosed structure to include buried roof structures.
- C. Interior Dry Area: Location inside building or structure where floor is not subject to liquid spills or wash down, and where wall or roof slab is not common to a water-holding or earth-retaining structure.
- D. Interior Wet Area: Location inside building or structure where floor is sloped to floor drains or gutters and is subject to liquid spills or wash down, or where wall, floor, or roof slab is common to a water-holding or earth-retaining structure.
- E. Submerged: Location at or below top of wall of open water-holding structure, such as a basin or channel, or wall, ceiling, or floor surface inside a covered water-holding structure, or exterior below grade wall or roof surface of water-holding structure, open or covered.

## 1.03 SUBMITTALS

- A. Action Submittals:
  - 1. Shop Drawings: Specific instructions for concrete anchor installation, including drilled hole size and depth, preparation, placement, procedures, and instructions for safe handling of anchoring systems.
- B. Informational Submittals:

POST-INSTALLED ANCHORS

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1. Concrete Anchors:
  - a. Manufacturer’s product description and installation instructions.
  - b. Current ICC-ES or IAPMO-UES Report for each type of post-installed anchor to be used.
  - c. Adhesive Anchor Installer Certification.
2. Passivation method for stainless steel members.
3. Hot-Dip Galvanizing: Certificate of Compliance signed by galvanizer, with description of material processed and ASTM standard used for coating.

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Installers of adhesive anchors horizontally or upwardly inclined to support sustained tension loads shall be certified by an applicable certification program. Certification shall include written and performance tests in accordance with the ACI/CRSI Adhesive Installer Certification Program or equivalent.
2. Galvanized Coating Applicator: Company specializing in hot-dip galvanizing after fabrication and following procedures of Quality Assurance Manual of the American Galvanizers Association.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Package stainless steel items in a manner to provide protection from carbon impregnation.
- B. Protect hot-dip galvanized finishes from damage as a result of metal banding and rough handling.

**PART 2 PRODUCTS**

2.01 GENERAL

- A. Unless otherwise indicated, meet the following requirements:

Item	ASTM Reference
<b>Stainless Steel:</b>	
Threaded Rods	F593, AISI Type 316, Condition CW
Nuts*	F594, AISI Type 316, Condition CW
<b>Carbon Steel:</b>	
Threaded Rods	A193/A193M, Grade B7
Flat and Beveled Washers (Hardened)	F436

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Item	ASTM Reference
Nuts*	A194/A194M, Grade 2H
Galvanized Steel:	
All	A153/A153M
*Nuts of other grades and styles having specified proof load stresses greater than specified grade and style are also suitable. Nuts must have specified proof load stresses equal to or greater than minimum tensile strength of specified threaded rod.	

- B. Bolts, Washers, and Nuts: Use stainless steel, hot-dip galvanized steel, and zinc-plated steel material types as indicated in Fastener Schedule at end of this section.

## 2.02 POST-INSTALLED CONCRETE ANCHORS

### A. General:

1. AISI Type 316 stainless, hot-dip galvanized or zinc-plated steel, as shown in Fastener Schedule at end of this section.
2. Post-installed anchor systems used in concrete shall be approved by ICC Evaluation Services Report or equivalent for use in cracked concrete and for short-term and long-term loads including wind and earthquake.
3. Mechanical Anchors: Comply with the requirements of ICC-ES AC193 or ACI 355.2.
4. Adhesive Anchors: Comply with the requirements of ICC-ES AC308 or ACI 355.4.
5. Acceptable for use in potable water structures by EPA and local health agencies or NSF 61.

### B. Torque-Controlled Expansion Anchors (Wedge Anchors):

1. Manufacturers and Products:
  - a. Hilti, Inc., Tulsa, OK; Kwik-Bolt –TZ (KB-TZ) Anchors (ESR-1917).
  - b. DeWalt/Powers Fasteners, Brewster, NY; Power-Stud +SD1, +SD2, +SD4, or +SD6 Anchors (ESR-2502 and ESR-2818).
  - c. Simpson Strong-Tie Co., Inc., Pleasanton, CA; Strong-Bolt 2 Anchors (ESR-1771 and ESR-3037).

### C. Undercut Anchors:

1. Manufacturers and Products:
  - a. USP Structural Connectors, Burnsville, MN; DUC Undercut Anchor (ESR-1970).
  - b. Hilti, Inc., Tulsa, OK; HDA Undercut Anchor (ESR-1546).

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- c. Simpson Strong-Tie Co., Inc., Pleasanton, CA; TORQ-CUT Self-Undercutting Anchor (ESR-2705).
- d. DeWalt/Powers Fasteners, Brewster, NY; Atomic+ Undercut Anchor (ESR-3067).

## D. Self-Tapping Concrete Screw Anchors:

1. Manufacturers and Products:
  - a. DeWalt/Powers Fasteners, Brewster, NY; Wedge-Bolt+ (ESR-2526).
  - b. DeWalt/Powers Fasteners, Brewster, NY; Vertigo+ Rod Hanger Screw Anchor (ESR-2989).
  - c. DeWalt/Powers Fasteners, Brewster, NY; Snake+ Flush Mount Screw Anchor (ESR-2272).
  - d. Hilti, Inc., Tulsa, OK; HUS-EZ Screw Anchor (ESR-3027).
  - e. Simpson Strong-Tie Co., Inc., Pleasanton, CA; Titen HD Screw Anchor (ESR-2713).

## E. Adhesive Anchors:

1. Threaded Rod:
  - a. Diameter as shown on Drawings.
  - b. Length as required to provide minimum depth of embedment indicated and thread projection required.
  - c. Clean and free of grease, oil, or other deleterious material.
2. Adhesive:
  - a. Two-component, insensitive to moisture, designed to be used in adverse freeze/thaw environments.
  - b. Cure Temperature, Pot Life, and Workability: Compatible for intended use and anticipated environmental conditions.
3. Packaging and Storage:
  - a. Disposable, self-contained system capable of dispensing both components in proper mixing ratio and fitting into a manually or pneumatically operated caulking gun.
  - b. Store adhesive on pallets or shelving in a covered storage area.
  - c. Package Markings: Include manufacturer's name, product name, batch number, product expiration date, ANSI hazard classification, and appropriate ANSI handling precautions.
  - d. Dispose of When:
    - 1) Shelf life has expired.
    - 2) Stored other than in accordance with manufacturer's instructions.
4. Manufacturers and Products:
  - a. Hilti, Inc., Tulsa, OK; HIT Doweling Anchor System, HIT RE 500 V3 (ESR-3814), or HIT-HY 200 (ESR-3187).

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- b. Simpson Strong-Tie Co., Inc., Pleasanton, CA; SET-XP Epoxy Adhesive Anchors (ESR-2508), or AT-XP Adhesive Anchors (IAPMO UES-263).
  - c. DeWalt/Powers Fasteners, Brewster NY; Pure 110+ Epoxy adhesive anchor system (ESR-3298).
- F. Adhesive Threaded Inserts:
1. Type 316 stainless steel, internally threaded inserts.
  2. Manufacturer and Product: Hilti, Inc., Tulsa, OK; HIS-RN Insert with HIT-RE 500-V3 or HIT-HY 200 adhesive.

**PART 3 EXECUTION**

## 3.01 CONCRETE ANCHORS

- A. Begin installation only after concrete to receive anchors has attained design strength.
- B. Locate existing reinforcing with Ground Penetrating Radar or other method approved by Engineer prior to drilling. Coordinate with Engineer to adjust anchor locations where installation would result in hitting reinforcing.
- C. Install in accordance with written manufacturer's instructions.
- D. Provide minimum embedment, edge distance, and spacing as indicated on Drawings.
- E. Use only drill type and bit type and diameter recommended by anchor manufacturer.
- F. Clean hole of debris and dust per manufacturer's requirements.
- G. When unidentified embedded steel, rebar, or other obstruction is encountered in drill path, slant drill to clear obstruction. If drill must be slanted more than indicated in manufacturer's installation instructions to clear obstruction, notify Engineer for direction on how to proceed.
- H. Adhesive Anchors:
  1. Unless otherwise approved by Engineer and adhesive manufacturer:
    - a. Do not install adhesive anchors when temperature of concrete or masonry is below 40 degrees F or above 100 degrees F.
    - b. Do not install prior to concrete attaining an age of 21 days.
    - c. Remove any standing water from hole with oil-free compressed air. Inside surface of hole shall be dry.
    - d. Do not disturb anchor during recommended curing time.

## POST-INSTALLED ANCHORS

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- e. Do not exceed maximum torque as specified in manufacturer’s instructions.

3.02 MANUFACTURER’S SERVICES

- A. Adhesive and Mechanical Anchors: Conduct Site training of installation personnel for proper installation, handling, and storage of adhesive anchor system. Notify Engineer of time and place for sessions.

3.03 FASTENER SCHEDULE

- A. Unless indicated otherwise on Drawings, provide fasteners as follows:

Service Use and Location	Product	Remarks
1. Post-Installed Anchors for Metal Components to Cast-in-Place Concrete (such as, Ladders, Handrail Posts, Electrical Panels, Platforms, and Equipment)		
All Areas not noted otherwise	Stainless steel anchors	Verify product acceptability and manufacturer’s requirements if anchor installation will occur in an overhead application
Submerged, Exterior, Interior Wet, and Corrosive Areas	Stainless steel adhesive anchors	Verify product acceptability and manufacturer’s requirements if anchor installation will occur in an overhead application
2. All Others		
All service uses and locations	Stainless steel fasteners	

- B. Antiseizing Lubricant: Use on all stainless steel threads.
- C. Do not use adhesive anchors to support fire-resistive construction or where ambient temperature will exceed 120 degrees F.

**END OF SECTION**

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**SECTION 05 50 00  
METAL FABRICATIONS**

**PART 1 GENERAL**

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. The Aluminum Association, Inc. (AA): The Aluminum Design Manual.
2. American Galvanizers Association (AGA):
  - a. Inspection of Hot-Dip Galvanized Steel Products.
  - b. Quality Assurance Manual.
3. American Institute of Steel Construction (AISC):
  - a. 201, Certification Program for Structural Steel Fabricators.
  - b. 206, Certification Program for Structural Steel Erectors—Standard for Structural Steel Erectors.
  - c. 303, Code of Standard Practices for Steel Buildings and Bridges.
  - d. 325, Steel Construction Manual.
  - e. 326, Detailing for Steel Construction.
  - f. 341, Seismic Provisions for Structural Steel Buildings.
  - g. 360, Specification for Structural Steel Buildings.
  - h. 420, Certification Standard for Shop Application of Complex Protective Coating Systems.
4. American Iron and Steel Institute (AISI): Stainless Steel Types.
5. American National Standards Institute (ANSI).
6. American Society of Safety Engineers (ASSE): A10.11, Safety Requirements for Personnel and Debris Nets.
7. American Welding Society (AWS):
  - a. D1.1/D1.1M, Structural Welding Code - Steel.
  - b. D1.2/D1.2M, Structural Welding Code - Aluminum.
  - c. D1.6/D1.6M, Structural Welding Code - Stainless Steel.
8. ASTM International (ASTM):
  - a. A36/A36M, Standard Specification for Carbon Structural Steel.
  - b. A48/A48M, Specification for Gray Iron Castings.
  - c. A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - d. A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
  - e. A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - f. A143/A143M, Standard for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
  - g. A153/A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

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- h. A193/A193M, Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
- i. A194/A194M, Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
- j. A240/A240M, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
- k. A276, Standard Specification for Stainless Steel Bars and Shapes.
- l. A283/A283M, Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
- m. A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- n. A380, Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems.
- o. A384/A384M, Standard Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies.
- p. A385/A385M, Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip).
- q. A489, Standard Specification for Carbon Steel Lifting Eyes.
- r. A500/A500M, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- s. A501, Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- t. A563, Standard Specification for Carbon and Alloy Steel Nuts.
- u. A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- v. A780/A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
- w. A786/A786M, Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
- x. A793, Standard Specification for Rolled Floor Plate, Stainless Steel.
- y. A967, Standard Specification for Chemical Passivation Treatments for Stainless Steel Parts.
- z. A992/A992M, Standard Specification for Structural Steel Shapes.
- aa. A1085, Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS).
- bb. B209, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- cc. B308/B308M, Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles.
- dd. B429/B429M, Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.

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- ee. B632/B632M, Standard Specification for Aluminum-Alloy Rolled Tread Plate.
  - ff. C881/C881M, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
  - gg. D1056, Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.
  - hh. F436, Standard Specification for Hardened Steel Washers.
  - ii. F468, Standard Specification for Nonferrous Bolts, Hex Cap Screws, and Studs for General Use.
  - jj. F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
  - kk. F594, Standard Specification for Stainless Steel Nuts.
  - ll. F844, Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use.
  - mm. F1554, Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
  - nn. F3125, Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.
9. NSF International (NSF): 61, Drinking Water System Components—Health Effects.
10. Specialty Steel Industry of North America (SSINA):
- a. Specifications for Stainless Steel.
  - b. Design Guidelines for the Selection and Use of Stainless Steel.
  - c. Stainless Steel Fabrication.
  - d. Stainless Steel Fasteners.

## 1.02 DEFINITIONS

- A. Anchor Bolt: Cast-in-place anchor; concrete or masonry.
- B. Corrosive Area: Containment area or area exposed to delivery, storage, transfer, or use of chemicals. Corrosive area includes areas exposed to corrosive atmosphere such as hydrogen sulfide from wastewater.
- C. Exterior Area: Location not protected from weather by building or other enclosed structure.
- D. Interior Dry Area: Location inside building or structure where floor is not subject to liquid spills or washdown, nor where wall or roof slab is common to a water-holding or earth-retaining structure.
- E. Interior Wet Area: Location inside building or structure where floor is sloped to floor drains or gutters and is subject to liquid spills or washdown, or where wall, floor, or roof slab is common to a water-holding or earth-retaining structure.

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- F. Submerged: Location at or below top of wall of open water-holding structure, such as basin or channel, or wall, ceiling or floor surface inside a covered water-holding structure, or exterior belowgrade wall or roof surface of water-holding structure, open or covered.

1.03 SUBMITTALS

A. Action Submittals:

1. Shop Drawings: Metal fabrications, including welding and fastener information.
2. Samples: Color samples of abrasive stair nosings.

B. Informational Submittals:

1. U-Channel Concrete Inserts:
  - a. Manufacturer's product description.
  - b. Allowable load tables.
2. Passivation method for stainless steel members.
3. Galvanized coating applicator qualifications.
4. Hot-Dip Galvanizing: Certificate of compliance signed by galvanizer, with description of material processed and ASTM standard used for coating.

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Galvanized Coating Applicator: Company specializing in hot-dip galvanizing after fabrication and following procedures of Quality Assurance Manual of the American Galvanizers Association.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Insofar as practical, factory assemble specified items. Package assemblies, which have to be shipped unassembled to protect materials from damage and tag to facilitate identification and field assembly.
- B. Package stainless steel items to provide protection from carbon impregnation.
- C. Protect painted coatings and hot-dip galvanized finishes from damage as a result of metal banding and rough handling. Use padded slings and straps.
- D. Store fabricated items in dry area, not in direct contact with ground.

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**PART 2 PRODUCTS**

## 2.01 GENERAL

- A. For hot-dip galvanized steel that is exposed to view and does not receive paint, limit the combined phosphorus and silicon content to 0.04 percent. For steels that require a minimum of 0.15 percent silicon (such as plates over 1.5 inches thick for ASTM A36/A36M steel), limit maximum silicon content to 0.21 percent and phosphorous content to 0.03 percent.
- B. Unless otherwise indicated, meet the following requirements:

Item	ASTM Reference
Aluminum – Plates and Shapes:	
Plates	B209, Alloy 6061-T6
Shapes	B308/B308M, Alloy 6061-T6
Aluminum – Fasteners:	
Bolts	F468, Alloy 2024-T4
Nuts	F467, Alloy 2024-T4
Washers	
Cast Iron:	
Cast Iron:	A48/A48M, Class 35
Stainless Steel – Plates and Shapes:	
Angles and Bars	A276, AISI Type 316 (316L for welded connections), 30 kips per square inch minimum yield stress
Plate, Sheet, and Strip	A240/A240M, AISI Type 316 (316L for welded connections), 30 kips per square inch minimum yield stress
Shapes – Rolled	A276, AISI Type 304 (304L for welded connections), 30 kips per square inch minimum yield stress A1069 (Laser-fused process), 30 kips per square inch minimum yield stress
Stainless Steel – Anchors and Fasteners:	
Anchor Bolts and Rods	F593, AISI Type 316, Group 2 Condition CW
Bolts	F593, AISI Type 316, Group 2 Condition CW
Nuts	F594, AISI Type 316, Condition CW
Threaded Rods	F593, AISI Type 316, Group 2 Condition CW

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Item	ASTM Reference
Washers	
Steel – Plates and Shapes:	
Hollow Structural Sections (HSS) – Round	A1085
Hollow Structural Sections (HSS) – Square and Rectangular	A1085
Pipe	A53/A53M, Grade B
Plates and Other Shapes	A36/A36M or A572/A572M, Grade 50 or A992/A992M for other steel shapes
Wide Flange Shapes	A992/992M
Steel – Anchors and Fasteners:	
Anchor Bolts and Rods	F1554, Grade 36, with weldability supplement S1.
Bolts	A307
High-Strength Bolts	F3125, Type 1
Eyebolts	A489
Flat Washers (Unhardened)	F844
Flat and Beveled Washers (Hardened)	F436
Nuts	A563
Threaded Rods	A36/A36M
Welded Anchor Studs	A108, Grades C-1010 through C-1020

- C. Bolts, Washers, and Nuts: Use stainless steel, hot-dip galvanized steel, zinc-plated steel, and aluminum material types as indicated in Fastener Schedule at end of this section.

## 2.02 ANCHOR BOLTS AND ANCHOR BOLT SLEEVES

### A. Cast-In-Place Anchor Bolts:

1. Headed type, unless otherwise shown on Drawings.
2. Material type and protective coating as shown in Fastener Schedule at end of this section.

### B. Anchor Bolt Sleeves:

1. Plastic:
  - a. Single unit construction with corrugated sleeve.

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- b. Top of sleeve shall be self-threading to provide adjustment of threaded anchor bolt projection.
- c. Material: High-density polyethylene.
2. Fabricated Steel: ASTM A36/A36M.

2.03 POST-INSTALLED CONCRETE AND MASONRY ANCHORS

- A. See Section 05 05 19, Post-Installed Anchors.

2.04 ACCESSORIES

- A. Antiseizing Lubricant for Stainless Steel Threaded Connections:

1. Suitable for potable water supply.
2. Resists washout.
3. Manufacturers and Products:
  - a. Bostik, Middleton, MA; Neverseez.
  - b. Saf-T-Eze Div., STL Corp., Lombard, IL; Anti-Seize.

- B. Neoprene Gasket:

1. ASTM D1056, 2C1, soft, closed-cell neoprene gasket material, suitable for exposure to sodium hypochlorite and degasifier cleaning solutions, unless otherwise shown on Drawings.
2. Thickness: Minimum 1/4 inch.
3. Furnish without skin coat.
4. Manufacturer and Product: Monmouth Rubber and Plastics Corporation, Long Branch, NJ; Durafoam DK1111LD.

2.05 FABRICATION

- A. General:

1. Finish exposed surfaces smooth, sharp, and to well-defined lines.
2. Furnish necessary rabbets, lugs, and brackets so work can be assembled in neat, substantial manner.
3. Conceal fastenings where practical; where exposed, flush countersink.
4. Drill metalwork and countersink holes as required for attaching hardware or other materials.
5. Grind cut edges smooth and straight. Round sharp edges to small uniform radius. Grind burrs, jagged edges, and surface defects smooth.
6. Fit and assemble in largest practical sections for delivery to Site.

- B. Materials:

1. Use steel shapes, unless otherwise noted.

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2. Steel to be hot-dip galvanized: Limit silicon content to less than 0.04 percent or to between 0.15 percent and 0.25 percent.
3. Fabricate aluminum in accordance with AA Specifications for Aluminum Structures—Allowable Stress Design.

## C. Welding:

1. Weld connections and grind exposed welds smooth. When required to be watertight, make welds continuous.
2. Welded fabrications shall be free from twisting or distortion caused by improper welding techniques.
3. Steel: Meet fabrication requirements of AWS D1.1/D1.1M, Section 5.
4. Aluminum: Meet requirements of AWS D1.2/D1.2M.
5. Stainless Steel: Meet requirements of AWS D1.6/D1.6M.
6. Complete welding before applying finish.

## D. Painting:

1. Coat surfaces of galvanized steel and aluminum fabricated items to be in direct contact with concrete, grout, masonry, or dissimilar metals, as specified in Section 09 90 00, Painting and Coating, unless indicated otherwise.
2. Do not apply protective coating to galvanized steel anchor bolts or galvanized steel welded anchor studs, unless indicated otherwise.

## E. Galvanizing:

1. Fabricate steel to be galvanized in accordance with ASTM A143/A143M, ASTM A384/A384M, and ASTM A385/A385M. Avoid fabrication techniques that could cause distortion or embrittlement of the steel.
2. Provide venting and drain holes for tubular members and fabricated assemblies in accordance with ASTM A385/A385M.
3. Remove welding slag, splatter, burrs, grease, oil, paint, lacquer, and other deleterious material prior to delivery for galvanizing.
4. Remove by blast cleaning or other methods surface contaminants and coatings not removable by normal chemical cleaning process in the galvanizing operation.
5. Hot-dip galvanize steel members, fabrications, and assemblies after fabrication in accordance with ASTM A123/A123M.
6. Hot-dip galvanize bolts, nuts, washers, and hardware components in accordance with ASTM A153/A153M. Oversize holes to allow for zinc alloy growth. Shop assemble bolts and nuts.
7. Galvanized steel sheets in accordance with ASTM A653/A653M.
8. Galvanize components of bolted assemblies separately before assembly. Galvanizing of tapped holes is not required.

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- F. Electrolytic Protection: Coat surfaces of galvanized steel and aluminum fabricated items to be in direct contact with concrete, grout, masonry, or dissimilar metals unless indicated otherwise.
- G. Fitting: Where movement of fabrications is required or shown, cut, fit, and align items for smooth operation. Make corners square and opposite sides parallel.
- H. Accessories: Furnish as required for a complete installation. Fasten by welding or with stainless steel bolts or screws.

## 2.06 SOURCE QUALITY CONTROL

- A. Visually inspect all fabrication welds and correct deficiencies.
  - 1. Steel: AWS D1.1/D1.1M, Section 6 and Table 6.1, Visual Inspection Acceptance Criteria.
  - 2. Aluminum: AWS D1.2/D1.2M.
  - 3. Stainless Steel: AWS D1.6/D1.6M.

**PART 3 EXECUTION**

## 3.01 INSTALLATION OF METAL FABRICATIONS

- A. General:
  - 1. Install metal fabrications plumb and level, accurately fitted, free from distortion or defects.
  - 2. Install rigid, substantial, and neat in appearance.
  - 3. Install manufactured products in accordance with manufacturer's recommendations.
  - 4. Obtain Engineer approval prior to field cutting steel members or making adjustments not scheduled.
- B. Aluminum:
  - 1. Do not remove mill markings from concealed surfaces.
  - 2. Remove inked or painted identification marks on exposed surfaces not otherwise coated after installed material has been inspected and approved.
  - 3. Fabrication, mechanical connections, and welded construction shall be in accordance with the AA Aluminum Design Manual.

## 3.02 CAST-IN-PLACE ANCHOR BOLTS

- A. Locate and hold anchor bolts in place with templates at time concrete is placed.
- B. Use anchor bolt sleeves for location adjustment and provide two nuts and one washer per bolt of same material as bolt.

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- C. Minimum Bolt Size: 1/2-inch diameter by 12 inches long, unless otherwise shown.

## 3.03 ELECTROLYTIC PROTECTION

- A. Aluminum and Galvanized Steel:
1. Coat surfaces of galvanized steel and aluminum fabricated items to be in direct contact with concrete, grout, masonry, or dissimilar metals, as specified in Section 09 90 00, Painting and Coating, unless indicated otherwise.
  2. Do not apply protective coating to galvanized steel anchor bolts or galvanized steel welded anchor studs, unless indicated otherwise.
  3. Allow coating to dry before installation of the material.
  4. Protect coated surfaces during installation.
  5. Should coating become marred, prepare and touch up in accordance with paint manufacturer's written instructions.
- B. Titanium: Where titanium equipment is in contact with concrete or dissimilar metal, provide full-face neoprene insulation gasket, 3/32-inch minimum thickness and 70-durometer hardness.
- C. Stainless Steel:
1. During handling and installation, take necessary precautions to prevent carbon impregnation of stainless steel members.
  2. After installation, visually inspect stainless steel surfaces for evidence of iron rust, oil, paint, and other forms of contamination.
  3. Remove contamination using cleaning and passivation methods in accordance with requirements of ASTM A380 and ASTM A967.
  4. Brushes used to remove foreign substances shall utilize only stainless steel or nonmetallic bristles.
  5. After treatment, visually inspect surfaces for compliance.

## 3.04 PAINTING

- A. Painted Galvanized Surfaces: Prepare as specified in Section 09 90 00, Painting and Coating.
- B. Repair of Damaged Hot-Dip Galvanized Coating:
1. Conform to ASTM A780/A780M.
  2. For minor repairs at abraded areas, use sprayed zinc conforming to ASTM A780/A780M.
  3. For flame cut or welded areas, use zinc-based solder, or zinc sticks, conforming to ASTM A780/A780M.

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4. Use magnetic gauge to determine thickness is equal to or greater than base galvanized coating.

C. Field Painting of Shop Primed Surfaces: Prepare surfaces and field finish in accordance with Section 09 90 00, Painting and Coating.

3.05 FIELD QUALITY ASSURANCE AND QUALITY CONTROL

A. Contractor-Furnished Quality Control: Manufacturer’s Certificate of Compliance per Section 01 61 00, Common Product Requirements, for test results, or calculations, or drawings that ensure material and equipment design and design criteria meet requirements of Section 01 61 00, Common Product Requirements.

3.06 FASTENER SCHEDULE

A. Unless indicated otherwise on Drawings, provide fasteners as follows:

Service Use and Location	Product	Remarks
1. Anchor Bolts Cast Into Concrete for Structural Steel, Metal Fabrications and Castings		
Exterior and Interior Areas	Stainless steel headed anchor bolts	
2. Anchor Bolts Cast Into Concrete for Equipment Bases		
Submerged, Exterior, Interior, and Corrosive Areas	Stainless steel headed anchor bolts with fusion bonded coating, unless otherwise specified with equipment	
3. Post-Installed Anchors: See Section 05 05 19, Post-Installed Anchors		
4. Connections for Structural Steel Framing		
Exterior and Interior Areas	High-strength steel bolted connections	Use hot-dipped galvanized high-strength bolted connections for galvanized steel framing members.
5. Connections of Aluminum Components		

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Service Use and Location	Product	Remarks
Submerged, Exterior and Interior Areas	Stainless steel bolted connections, unless otherwise specified with equipment	
6. All Others		
Exterior and Interior Wet and Dry Areas	Stainless steel fasteners	

B. Antiseizing Lubricant: Use on stainless steel threads.

**END OF SECTION**

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**SECTION 08 34 17**  
**VERTICAL BI-FOLD DOORS**

**PART 1 GENERAL**

1.01 REFERENCES

- A. The follow is a list of standards which may be referenced in this section:
1. American Institute of Steel Construction (AISC): AISC 325, Steel Construction Manual.
  2. American Iron and Steel Institute (AISI): AISI, SG-971-Spec, Specification and Commentary for the Design of Cold-Formed Steel Structural Members.
  3. ASTM International (ASTM):
    - a. A36, Standard Specification for Carbon Structural Steel.
    - b. A366, Standard Specification for Commercial Steel (CS) Sheet, Carbon, (0.15 Maximum Percent) Cold-Rolled.
    - c. A500, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
    - d. A653, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
    - e. A1011, Standard Specification for Steel, Sheet, and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability and Ultra-High Strength.

1.02 DESIGN REQUIREMENTS

- A. General:
1. Governing Design Code: Structural design for the door assembly shall be provided by the bifold door manufacturer based on the Florida Building Code, 6<sup>th</sup> Edition (2017). Bifold door manufacturer to supply a certified Miami-Dade Notice of Approval.
  2. Bi-fold Door Design: Design bifold doors in accordance with the criteria specified in the Section, and in the Drawings, including proper operation without binding, interference or damage to weatherstripping and adjacent building construction. Design bifold doors to fit closely and to be free of warping.
  3. Steel Design: AISC 325.

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4. Design Loads: In the closed position or any open position, the doors shall resist gravity loads combined with a wind load inwards or outwards based on the design wind speed established in the Project Structural Drawings without over stressing members, connections or hardware, and with not more than 2-inch deflection against the seals and with the allowable deflection limits for application of cladding material. Design doors for a temperature difference of 80 degrees F between the inside face, including plenums and the outside of the building. Consider vibration and torsion stresses due to design wind pressures when the door is open or closed. Manufacturer's Engineer is responsible for wind pressure resistance design and for meeting requirements of the cladding material.
5. Door Seals: Use sealing system between door frame and building, between door frame and foundation, designed to provide an air tight closure with the building. Coordinate the design of the door seal system with the building architectural and structural details, and the mechanical ventilation systems. Use door sealing system designed for ease of replacement and that incorporates commercially available components.

### 1.03 SUBMITTALS

#### A. Action Submittals:

1. Shop Drawings:
  - a. Submit Design Drawings covering door structure, door panel infill, all operation devices, mechanical systems, electrical and control systems, and safety systems.
  - b. Show all details for construction, installation and operation; size, shapes and thickness of materials, joints and connections; reinforcing; hardware; mechanical devices; electrical devices; and all design and detail data for work of other trades affected by bifold doors.
2. Design Calculations:
  - a. The Bi-fold Door shall be engineered to resist Project wind pressure.
  - b. Submit signed and sealed Drawings and design calculations prepared by a State of Florida registered structural engineer covering complete door assembly.
  - c. Include summary of Structural Design Criteria.
  - d. Provide door weight, method of suspension, operation, and all fastenings to adjacent structure.
  - e. Provide complete list of all structural forces and loads imposed on the building by the door assembly in all operating positions.
3. Face Material of Bi-Fold Door: Manufacturer of bifold door is responsible for providing engineering and frame for cladding door with metal wall panels specified in this section. All calculations for operation and wind resistance submitted by door manufacturer shall reflect the door faced with this cladding.

#### B. Informational Submittals:

VERTICAL BI-FOLD DOORS

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1. Manufacturer's Instructions: Indicate installation, adjustment, and alignment procedures.
2. Operation and Maintenance Data including complete operating instructions, lubrication requirements and frequency, and periodic adjustments required.
3. Complete electrical equipment wiring diagrams.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, boxes or crates bearing the manufacturer's name, brand and model number. Store all materials and equipment in dry locations with adequate ventilation, free from dust or water, and to permit access for inspection and handling. Handle doors carefully to prevent damage. Remove damaged items that cannot be restored to like-new condition and provide new items.

1.05 QUALITY ASSURANCE

- A. Manufacture Qualifications: the production of similar doors, for use on industrial projects, of equal or greater complexity to those required under this contract, and has successfully completed at least five installations of similar design. Provide written evidence listing the name of the installations, locations, owners, overall sizes of the doors and types of door operation. Any submittal made without such evidence will be rejected and returned to the Contractor unchecked. Using the above criteria, obtain bids from qualified door manufacturers only. Failure to comply with this requirement shall be solely the Contractor's financial responsibility, with no additional cost to the Owner.
- B. Installer Qualifications: Door erection shall be by an authorized representative of the door manufacturer and in accordance with approved Shop Drawings. Use skilled mechanics experienced in the erection of large bifold doors of this type.

1.06 WARRANTY

- A. Product: Provide manufacturer's extended guarantee or warranty, with Owner named as beneficiary in writing and signed by Manufacturer. Guarantee shall provide for correction, or at option of Owner, removal and replacement, of Work specified in this section found defective during a period of 5 years after date of Substantial Completion.
- B. Conditions:
1. Defects and damage which arise through normal anticipated usage of the door during the warranty period.
  2. No leakage of water to interior of the building.

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**PART 2 PRODUCTS**

## 2.01 BASIS OF DESIGN

- A. Provide bifold door manufactured by Schweiss, Fairfax, MN. ([www.bifold.com](http://www.bifold.com)) R & M Steel Company (<https://rmsteel.com/bifold/>), or Wellbilt Industries (<https://www.wellbiltdoors.com/bi-fold-hangar-doors>), or approved equal.

## 2.02 BIFOLD DOOR FABRICATION

- A. Bifold doors shall be of the manual crank operated canopy type.
- B. When in the open position, the doors shall have a slight slope to direct drainage away from the building wall.
- C. Doors shall be hinged horizontally at the top and center, and be arranged to open by moving frame out and up.
- D. Coordinate door top hinges to align with the building structural members.
- E. Door shall be self-supported, including metal panel infill, with only the top hinges, bottom door rollers and column followers/wind rails.
- F. The door framework shall consist of jig welded steel tube sections engineered by the door manufacturer to resist all anticipated loads without sagging, bowing or conflicting with its smooth operation.
- G. Structural steel door framing members shall be ASTM A500/A500M Grade B square structural welded steel tubing capable of supporting the panel infill as indicated in the Drawings.
- H. Door Infill: Within the door's structural framework and as shown in the Drawings, provide full height and width metal panels as specified in this section.
- I. Provide complete and secure mounting within the bifold door structural frame for weathertight installation and safe operation.
- J. Provide all labor, materials, accessories, equipment and services necessary to furnish a complete installation of the bifold doors including frame, infill, sections, brackets, guides, tracks, hardware, operators, controls, and operation instructions.
- K. Shop connections shall be welded.
- L. Field connections shall be bolted.

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## 2.03 DRIVESHAFT AND LIFT DRUMS

- A. Provide solid steel driveshaft with lift drums mounted on bottom cord of door, continuously along entire door width providing an even lift of the door at all times.
- B. Provide greaseable bearing mounts.
- C. Solid driveshaft and lift drums shall provide minimum safety factor of 5:1.

## 2.04 LIFTING STRAPS

- A. The door shall be operated by a system of lifting straps (Not Cables), lifting drums, and drive shafts. Lift Straps and Lift Drums shall be manufacturer's standard adequately sized in sufficient amount that provides a safety factor of 5:1.
- B. Provide all necessary guards and protective devices for safe operation and use.

## 2.05 CONSTRUCTION AND PARTS

- A. Provide manufacturer's heavy-duty parts throughout including the following:
  - 1. Heavy duty hinges, internal truss, heavy duty side rollers, column followers/wind rails, wind pins, latching system, and other standard items.

## 2.06 FINISH

- A. The door frame members and all steel parts shall be factory primer finished with epoxy primer compatible with Paint System No. 6 as specified in Section 09 90 00 Paints and Coatings. Finish coating will be field applied.

## 2.07 WEATHERSTRIPPING

- A. Provide manufacturer's standard seal continuous at top, bottom of each door. The entire door perimeter shall be weather tight.

## 2.08 MATERIALS

- A. Structural Steel: ASTM A36/A36M.
- B. Formed Steel: AISI SG-971-Specification.
- C. Sheet Steel: ASTM A1011/A1011M, hot-rolled sheet steel, commercial quality, or ASTM A366/A366M, cold-rolled steel sheet, commercial quality.
- D. Stainless Steel: 316 stainless steel.

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2.09 METAL DOOR INFILL PANELS

A. Manufacturer and Product:

1. McElroy Metal, Inc., R-Panel Panel, Wall-24 Ga. minimum.
2. Miami-Dade Notice of Acceptance (NOA) No.: 17-0829.05.
3. Finish:
  - a. Substrate: Galvalume.
  - b. Coating: Kynar 500 (PVDF).

**PART 3 EXECUTION**

3.01 GENERAL INSTALLATION REQUIREMENTS

- A. Door assembly installation shall be performed by workmen skilled in this type of work in accordance with the approved erection Shop Drawings and procedures. Use erecting equipment suitable for the work and in fully operable condition.

3.02 EXAMINATION

- A. Examine wall and overhead areas, including opening framing and blocking for compliance with requirements for installation tolerances, clearances, and other conditions affecting performance of Work of this section.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.03 ERECTION

A. Assembly and Installation:

1. Assemble doors and accessories in accordance with approved Shop Drawings. Do not erect doors until the work of other trades in preparing the opening has been completed and the hangar roof is completed and under full dead load. After erection is complete and before field painting is started, thoroughly clean all abraded surfaces, field welds, and field bolts; Leave doors clean after erection on both interior and exterior. Field painting is specified in Section 09 90 00, Painting and Coatings.
2. Door manufacturer is required to coordinate with other building trades in the development of the exact installation details.
3. Install door, complete with operating equipment, controls and all necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment supports according to manufacturer's written instructions.
4. Set top and bottom Limits and adjust operation to manufacturer's standards.

- B. Door Infill Panels: Install bifold door panels complete with infill as specified for weather tight installation and operation.

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- C. Safety Markings: Apply proper safety markings for any potentially hazardous locations related to the operation of the door.
- D. Safety Signage:
  - 1. Furnish warning labels for any potentially hazardous locations related to the operation of the door.
  - 2. Fasten operation and warning labels to the bifold door frame and by the operator's station in accordance with manufacturer's instructions. Warning signs to meet CFR and OSHA requirements.
- E. Compliance Certificates: Signed by manufacturer certifying that installed doors comply with specified and manufacturer's requirements for safe operation.
- F. Complete Installation:
  - 1. Lubricate, test, and adjust doors to operate easily, free from warp, twist, or distortion and fitting weathertight for entire perimeter.
  - 2. Final Adjustments: Lubricate bearings and moving parts, adjust open and closed limits and for doors to operate easily, free from warp, twist, or distortion and fitting weathertight for the entire perimeter.
  - 3. Check and readjust operating hardware items, leaving vertical bifold doors undamaged and in complete and proper operating condition.

**END OF SECTION**

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**SECTION 09 90 00**  
**PAINTING AND COATING**

**PART 1 GENERAL**

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Water Works Association (AWWA):
    - a. C203, Coal-Tar Protective Coatings and Linings for Steel Water Pipelines—Enamel and Tape—Hot-Applied.
    - b. C209, Cold-Applied Tape Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines.
    - c. C213, Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.
    - d. C214, Tape Coating Systems for the Exterior of Steel Water Pipelines.
  2. Environmental Protection Agency (EPA).
  3. NACE International (NACE): SP0188, Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.
  4. NSF International (NSF): 61, Drinking Water System Components - Health Effects.
  5. Occupational Safety and Health Act (OSHA).
  6. Research Council on Structural Connections (RCSC): Specification for Structural Joints using High-Strength Bolts.
  7. The Society for Protective Coatings (SSPC):
    - a. PA 2, Procedure for Determining Conformance to Dry Coating Thickness Requirements.
    - b. PA 10, Guide to Safety and Health Requirements for Industrial Painting Projects.
    - c. SP 1, Solvent Cleaning.
    - d. SP 2, Hand Tool Cleaning.
    - e. SP 3, Power Tool Cleaning.
    - f. SP 5, White Metal Blast Cleaning.
    - g. SP 6, Commercial Blast Cleaning.
    - h. SP 7, Joint Surface Preparation Standard Brush-Off Blast Cleaning.
    - i. SP 10, Near-White Blast Cleaning.
    - j. SP 11, Power Tool Cleaning to Bare Metal.
    - k. SP 16, Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.
    - l. SP 13, Surface Preparation of Concrete.
    - m. Guide 15, Field Methods for Retrieval and Analysis of Soluble Salts on Steel and Other Nonporous Substrates.

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## 1.02 DEFINITIONS

## A. Terms used in this section:

1. Coverage: Total minimum dry film thickness in mils or square feet per gallon.
2. FRP: Fiberglass Reinforced Plastic.
3. HCl: Hydrochloric Acid.
4. MDFT: Minimum Dry Film Thickness, mils.
5. MDFTPC: Minimum Dry Film Thickness per Coat, mils.
6. Mil: Thousandth of an inch.
7. PDS: Product Data Sheet.
8. PSDS: Paint System Data Sheet.
9. PVC: Polyvinyl Chloride.
10. SFPG: Square Feet per Gallon.
11. SFPGPC: Square Feet per Gallon per Coat.
12. SP: Surface Preparation.

## 1.03 SUBMITTALS

## A. Action Submittals:

1. Shop Drawings:
  - a. Data Sheets:
    - 1) For each product, furnish a Product Data Sheet (PDS), the manufacturer's technical data sheets, and paint colors available (where applicable). The PDS form is appended to the end of this section.
    - 2) For each paint system, furnish a Paint System Data Sheet (PSDS). The PSDS form is appended to the end of this section.
    - 3) Technical and performance information that demonstrates compliance with specification.
    - 4) Furnish copies of paint system submittals to the coating applicator.
    - 5) Indiscriminate submittal of only manufacturer's literature is not acceptable.
  - b. Detailed chemical and gradation analysis for each proposed abrasive material.
2. Samples:
  - a. Proposed Abrasive Materials: Minimum 5-pound sample for each type.
  - b. Reference Panel:
    - 1) Surface Preparation:
      - a) Prior to start of surface preparation, furnish a 4-inch by 4-inch steel panel for each grade of sandblast specified herein, prepared to specified requirements.

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- b) Provide panel representative of the steel used; prevent deterioration of surface quality.
  - c) Panel to be reference source for inspection upon approval by Engineer.
- 2) Paint:
- a) Unless otherwise specified, before painting work is started, prepare minimum 8-inch by 10-inch sample with type of paint and application specified on similar substrate to which paint is to be applied.
  - b) Furnish additional samples as required until colors, finishes, and textures are approved.
  - c) Approved samples to be the quality standard for final finishes.

B. Informational Submittals:

1. Applicator's Qualification: List of references substantiating experience.
2. Coating manufacturer's Certificate of Compliance, in accordance with Section 01 43 33, Manufacturers' Field Services.
3. Factory Applied Coatings: Manufacturer's certification stating factory applied coating system meets or exceeds requirements specified.
4. Manufacturer's written verification that submitted material is suitable for the intended use.
5. Coating for Faying Surfaces: Manufacturer's test results that show the proposed coating meets the slip resistance requirements of the AISC Specification for Structural Joints using ASTM A325 or ASTM A490 bolts.
6. If the manufacturer of finish coating differs from that of shop primer, provide finish coating manufacturer's written confirmation that materials are compatible.
7. Manufacturer's written instructions and special details for applying each type of paint.

1.04 QUALITY ASSURANCE

- A. Applicator Qualifications: Minimum 5 years' experience in application of specified products.
- B. Regulatory Requirements:
1. Meet federal, state, and local requirements limiting the emission of volatile organic compounds.
  2. Perform surface preparation and painting in accordance with recommendations of the following:
    - a. Paint manufacturer's instructions.
    - b. SSPC PA 10.
    - c. Federal, state, and local agencies having jurisdiction.

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1.05 DELIVERY, STORAGE, AND HANDLING

A. Shipping:

1. Where precoated items are to be shipped to the Site, protect coating from damage. Batten coated items to prevent abrasion.
2. Protect shop painted surfaces during shipment and handling by suitable provisions including padding, blocking, and use of canvas or nylon slings.

B. Storage:

1. Store products in a protected area that is heated or cooled to maintain temperatures within the range recommended by paint manufacturer.
2. Primed surfaces shall not be exposed to weather for more than 2 months before being topcoated, or less time if recommended by coating manufacturer.

1.06 PROJECT CONDITIONS

A. Environmental Requirements:

1. Do not apply paint in temperatures or moisture conditions outside of manufacturer's recommended maximum or minimum allowable.
2. Do not perform final abrasive blast cleaning whenever relative humidity exceeds 85 percent, or whenever surface temperature is less than 5 degrees F above dew point of ambient air.
3. Abrasive blasting is not allowed at the degasifier units.

**PART 2 PRODUCTS**

2.01 MANUFACTURERS

- A. Nationally recognized manufacturers of paints and protective coatings who are regularly engaged in the production of such materials for essentially identical service conditions.
- B. Minimum of 5 years' verifiable experience in manufacture of specified product.

2.02 ABRASIVE MATERIALS

- A. Select abrasive type and size to produce surface profile that meets coating manufacturer's recommendations for specific primer and coating system to be applied.

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## 2.03 PAINT MATERIALS

## A. General:

1. Manufacturer's highest quality products suitable for intended service.
2. Compatibility: Only compatible materials from a single manufacturer shall be used in the Work. Particular attention shall be directed to compatibility of primers and finish coats.
3. Thinners, Cleaners, Driers, and Other Additives: As recommended by coating manufacturer.

## B. Products:

<b>Product</b>	<b>Definition</b>
Acrylic Latex	Single-component, finish as required
Acrylic Latex (Flat)	Flat latex
Acrylic Sealer	Clear acrylic
Alkyd (Semigloss)	Semigloss alkyd
Alkyd Enamel	Optimum quality, gloss or semigloss finish as required, medium long oil
Bituminous Paint	Single-component, coal-tar pitch based
Block Filler	Primer-sealer designed for rough masonry surfaces, 100% acrylic emulsion
Coal-Tar Epoxy	Amine, polyamide, or phenolic epoxy type 70% volume solids minimum, suitable for immersion service
DTM Acrylic Primer	Surface tolerant, direct-to-metal water borne acrylic primer
DTM Acrylic Finish	Surface tolerant, direct-to-metal water borne acrylic finish coat
Elastomeric Polyurethane	100% solids, plural component, spray applied, high build, elastomeric polyurethane coating, suitable for the intended service
Epoxy Filler/Surfacer	100% solids epoxy trowel grade filler and surfacer, nonshrinking, suitable for application to concrete and masonry. Approved for potable water contact and conforming to NSF 61, where required
Epoxy Nonskid (Aggregated)	Polyamidoamine or amine converted epoxies aggregated; aggregate may be packaged separately
Epoxy Primer—Ferrous Metal	Anticorrosive, converted epoxy primer containing rust-inhibitive pigments

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<b>Product</b>	<b>Definition</b>
Epoxy Primer— Other	Epoxy primer, high-build, as recommended by coating manufacturer for specific galvanized metal, copper, or nonferrous metal alloy to be coated
Fusion Bonded Coating	100% solids, thermosetting, fusion bonded, dry powder epoxy, suitable for the intended service
TFE Lube or Grease Lube	Tetrafluoroethylene, liquid coating, or open gear grease as supplied by McMaster-Carr Supply Corporation, Elmhurst, IL
High Build Epoxy	Polyamidoamine epoxy, minimum 69% volume solids, capability of 4 to 8 MDFT per coat
Inorganic Zinc Primer	Solvent or water based, having 85% metallic zinc content in the dry film; follow manufacturer's recommendation for topcoating
Latex Primer Sealer	Waterborne vinyl acrylic primer/sealer for interior gypsum board and plaster. Capable of providing uniform seal and suitable for use with specified finish coats
NSF Epoxy	Polyamidoamine epoxy, approved for potable water contact and conforming to NSF 61
Epoxy, High Solids	Polyamidoamine epoxy, 80% volume solids, minimum, suitable for immersion service
Polyurethane Enamel	Two-component, aliphatic or acrylic based polyurethane; high gloss finish
Organic Zinc Rich Primer	Epoxy or moisture cured urethane with 85-percent zinc content in the dry film, meeting the requirements of RCSC Specification for Structural Joints using High Strength Bolts, Class A or Class B, as required.
Rust-Inhibitive Primer	Single-package steel primers with anticorrosive pigment loading
Water Base Epoxy	Two-component, polyamide epoxy emulsion, finish as required

## 2.04 MIXING

### A. Multiple-Component Coatings:

1. Prepare using each component as packaged by paint manufacturer.
2. No partial batches will be permitted.
3. Do not use multiple-component coatings that have been mixed beyond their pot life.

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4. Furnish small quantity kits for touchup painting and for painting other small areas.
  5. Mix only components specified and furnished by paint manufacturer.
  6. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.
- B. Colors: Formulate paints with colorants free of lead, lead compounds, or other materials that might be affected by presence of hydrogen sulfide or other gas likely to be present at Site.

## 2.05 SHOP FINISHES

- A. Shop Blast Cleaning: Reference Paragraph, Shop Coating Requirements.
- B. Surface Preparation: Provide Engineer minimum 7 days' advance notice to start of shop surface preparation work and coating application work.
- C. Shop Coating Requirements:
1. When required by equipment specifications, such equipment shall be primed and finish coated in shop by manufacturer and touched up in field with identical material after installation.
  2. Where manufacturer's standard coating is not suitable for intended service condition, Engineer may approve use of a tie-coat to be used between manufacturer's standard coating and specified field finish. In such cases, tie-coat shall be surface tolerant epoxy as recommended by manufacturer of specified field finish coat. Coordinate details of equipment manufacturer's standard coating with field coating manufacturer.

**PART 3 EXECUTION**

## 3.01 GENERAL

- A. Provide Engineer minimum 7 calendar days' advance notice to start of field surface preparation work and coating application work.
- B. Perform the Work only in presence of Engineer, unless Engineer grants prior approval to perform the Work in Engineer's absence.
- C. Schedule inspection of cleaned surfaces and all coats prior to succeeding coat in advance with Engineer.

## 3.02 EXAMINATION

- A. Factory Finished Items:
1. Schedule inspection with Engineer before repairing damaged factory-finished items delivered to Site.

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2. Repair abraded or otherwise damaged areas on factory-finished items as recommended by coating manufacturer. Carefully blend repaired areas into original finish. If required to match colors, provide full finish coat in field.
- B. Surface Preparation Verification: Inspect and provide substrate surfaces prepared in accordance with these Specifications and printed directions and recommendations of paint manufacturer whose product is to be applied. The more stringent requirements shall apply.

## 3.03 PROTECTION OF ITEMS NOT TO BE PAINTED

- A. Remove, mask, or otherwise protect hardware, lighting fixtures, switchplates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not specified elsewhere to be painted.
- B. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces.
- C. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process.
- D. Mask openings in motors to prevent paint and other materials from entering.
- E. Protect surfaces adjacent to or downwind of Work area from overspray.

## 3.04 SURFACE PREPARATION

- A. Field Abrasive Blasting:
1. Perform blasting for items and equipment where specified and as required to restore damaged surfaces previously shop or field blasted and primed or coated.
  2. Refer to coating systems for degree of abrasive blasting required.
  3. Where the specified degree of surface preparation differs from manufacturer's recommendations, the more stringent shall apply.
- B. Metal Surface Preparation:
1. Where indicated, meet requirements of SSPC Specifications summarized below:
    - a. SP 1, Solvent Cleaning: Removal of visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants by cleaning with solvent.
    - b. SP 2, Hand Tool Cleaning: Removal of loose rust, loose mill scale, loose paint, and other loose detrimental foreign matter, using nonpower hand tools.

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- c. SP 3, Power Tool Cleaning: Removal of loose rust, loose mill scale, loose paint, and other loose detrimental foreign matter, using power-assisted hand tools.
  - d. SP 5, White Metal Blast Cleaning: Removal of visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides, corrosion products, and other foreign matter by blast cleaning.
  - e. SP 6, Commercial Blast Cleaning: Removal of visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides, corrosion products, and other foreign matter, except for random staining limited to no more than 33 percent of each unit area of surface which may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coatings.
  - f. SP 7, Brush-Off Blast Cleaning: Removal of visible rust, oil, grease, soil, dust, loose mill scale, loose rust, and loose coatings. Tightly adherent mill scale, rust, and coating may remain on surface.
  - g. SP 10, Near-White Blast Cleaning: Removal of visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides, corrosion products, and other foreign matter, except for random staining limited to no more than 5 percent of each unit area of surface which may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coatings.
  - h. SP 11, Power Tool Cleaning to Bare Metal: Removal of visible oil, grease, dirt, dust, mill scale, rust, paint, oxide, corrosion products, and other foreign matter using power-assisted hand tools capable of producing suitable surface profile. Slight residues of rust and paint may be left in lower portion of pits if original surface is pitted.
  - i. SP-16, Brush Blasting of Non-Ferrous Metals: A brush-off blast cleaned non-ferrous metal surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, metal oxides (corrosion products), and other foreign matter. Intact, tightly adherent coating is permitted to remain. A coating is considered tightly adherent if it cannot be removed by lifting with a dull putty knife. Bare metal substrates shall have a minimum profile of 19 micrometers (0.75 mil).
2. The words “solvent cleaning”, “hand tool cleaning”, “wire brushing”, and “blast cleaning”, or similar words of equal intent in these Specifications or in paint manufacturer’s specification refer to the applicable SSPC Specification.
  3. Where OSHA or EPA regulations preclude standard abrasive blast cleaning, wet or vacu-blast methods may be required. Coating manufacturers’ recommendations for wet blast additives and first coat application shall apply.
  4. Ductile Iron Pipe Supplied with Asphaltic Varnish Finish: Remove asphaltic varnish finish prior to performing specified surface preparation.
  5. Hand tool clean areas that cannot be cleaned by power tool cleaning.
  6. Round or chamfer sharp edges and grind smooth burrs, jagged edges, and surface defects.

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7. Welds and Adjacent Areas:
    - a. Prepare such that there is:
      - 1) No undercutting or reverse ridges on weld bead.
      - 2) No weld spatter on or adjacent to weld or any area to be painted.
      - 3) No sharp peaks or ridges along weld bead.
    - b. Grind embedded pieces of electrode or wire flush with adjacent surface of weld bead.
  8. Preblast Cleaning Requirements:
    - a. Remove oil, grease, welding fluxes, and other surface contaminants prior to blast cleaning.
    - b. Cleaning Methods: Steam, open flame, hot water, or cold water with appropriate detergent additives followed with clean water rinsing.
    - c. Clean small isolated areas as above or solvent clean with suitable solvent and clean cloth.
  9. Blast Cleaning Requirements:
    - a. Type of Equipment and Speed of Travel: Design to obtain specified degree of cleanliness. Minimum surface preparation is as specified herein and takes precedence over coating manufacturer's recommendations.
    - b. Select type and size of abrasive to produce surface profile that meets coating manufacturer's recommendations for particular primer to be used.
    - c. Use only dry blast cleaning methods.
    - d. Do not reuse abrasive, except for designed recyclable systems.
    - e. Meet applicable federal, state, and local air pollution and environmental control regulations for blast cleaning, confined space entry (if required), and disposition of spent aggregate and debris.
  10. Post-Blast Cleaning and Other Cleaning Requirements:
    - a. Clean surfaces of dust and residual particles from cleaning operations by dry (no oil or water vapor) air blast cleaning or other method prior to painting. Vacuum clean enclosed areas and other areas where dust settling is a problem and wipe with a tack cloth.
    - b. Paint surfaces the same day they are blasted. Reblast surfaces that have started to rust before they are painted.
- C. Concrete Surface Preparation:
1. Do not begin until 30 days after concrete has been placed.
  2. Meet requirements of SSPC SP 13.
  3. Remove grease, oil, dirt, salts or other chemicals, loose materials, or other foreign matter by solvent, detergent, or other suitable cleaning methods.
  4. Brush-off blast clean to remove loose concrete and laitance, and provide a tooth for binding. Upon approval by Engineer, surface may be cleaned by acid etching method. Approval is subject to producing desired profile

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equivalent to No. 80 grit flint sandpaper. Acid etching of vertical or overhead surfaces shall not be allowed.

5. Secure coating manufacturer's recommendations for additional preparation, if required, for excessive bug holes exposed after blasting.
6. Unless otherwise required for proper adhesion, ensure surfaces are dry prior to painting.

D. Plastic and FRP Surface Preparation:

1. Hand sand plastic surfaces to be coated with medium grit sandpaper to provide tooth for coating system.
2. Large areas may be power sanded or brush-off blasted, provided sufficient controls are employed so surface is roughened without removing excess material.

E. Masonry Surface Preparation:

1. Complete and cure masonry construction for 14 days or more before starting surface preparation work.
2. Remove oil, grease, dirt, salts or other chemicals, loose materials, or other foreign matter by solvent, detergent washing, or other suitable cleaning methods.
3. Clean masonry surfaces of mortar and grout spillage and other surface deposits using one of the following:
  - a. Nonmetallic fiber brushes and commercial muriatic acid followed by rinsing with clean water.
  - b. Brush-off blasting.
  - c. Water blasting.
4. Do not damage masonry mortar joints or adjacent surfaces.
5. Leave surfaces clean and, unless otherwise required for proper adhesion, dry prior to painting.
6. Masonry Surfaces to be Painted: Uniform texture and free of surface imperfections that would impair intended finished appearance.
7. Masonry Surfaces to be Clear Coated: Free of discolorations and uniform in texture after cleaning.

F. Existing Painted Surfaces to be Repainted Surface Preparation:

1. Detergent wash and freshwater rinse.
2. Clean loose, abraded, or damaged coatings to substrate by hand or power tool, SP 2 or SP 3.
3. Feather surrounding intact coating.
4. Apply one spot coat of specified primer to bare areas, overlapping prepared existing coating.
5. Apply one full finish coat of specified primer to entire surface.
6. If an aged, plural-component material is to be topcoated, contact coating manufacturer for additional surface preparation requirements.

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7. Application of Cosmetic Coat:
  - a. It is assumed that existing coatings have oxidized sufficiently to prevent lifting or peeling when overcoated with paints specified.
  - b. Check compatibility by application to a small area prior to starting painting.
  - c. If lifting or other problems occur, request disposition from Engineer.
8. Perform blasting as required to restore damaged surfaces. Materials, equipment, procedures shall meet requirements of SSPC.

## 3.05 SURFACE CLEANING

## A. Brush-off Blast Cleaning:

1. Equipment, procedure, and degree of cleaning shall meet requirements of SSPC SP 7.
2. Abrasive: Either wet or dry blasting sand, grit, or nutshell.
3. Select various surface preparation parameters, such as size and hardness of abrasive, nozzle size, air pressure, and nozzle distance from surface such that surface is cleaned without pitting, chipping, or other damage.
4. Verify parameter selection by blast cleaning a trial area that will not be exposed to view.
5. Engineer will review acceptable trial blast cleaned area and use area as a representative sample of surface preparation.
6. Repair or replace surface damaged by blast cleaning.

## B. Solvent Cleaning:

1. Consists of removal of foreign matter such as oil, grease, soil, drawing and cutting compounds, and any other surface contaminants by using solvents, emulsions, cleaning compounds, steam cleaning, or similar materials and methods that involve a solvent or cleaning action.
2. Meet requirements of SSPC SP 1.

## 3.06 APPLICATION

## A. General:

1. The intention of these Specifications is for existing and new, interior and exterior masonry, concrete, and metal, surfaces to be painted, whether specifically mentioned or not, except as specified otherwise. Do not paint exterior concrete surfaces, unless specifically indicated.
2. Apply coatings in accordance with these Specifications and paint manufacturers' printed recommendations and special details. The more stringent requirements shall apply. Allow sufficient time between coats to assure thorough drying of previously applied paint.
3. Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.

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4. Fusion Bonded Coatings Method Application: Electrostatic, fluidized bed, or flocking.
  5. Coat units or surfaces to be bolted together or joined closely to structures or to one another prior to assembly or installation.
  6. On pipelines, terminate coatings along pipe runs to 1 inch inside pipe penetrations.
  7. All field painting to be applied by brush or roller only. Spray painting shall not be permitted.
  8. Keep paint materials sealed when not in use.
  9. Where more than one coat is applied within a given system, alternate colors to provide a visual reference showing required number of coats have been applied.
- B. Porous Surfaces, Such As Concrete and Masonry:
1. Filler/Surfacer: Use coating manufacturer's recommended product to fill air holes, bug holes, and other surface voids or defects.
  2. Prime Coat: May be thinned to provide maximum penetration and adhesion.
    - a. Type and Amount of Thinning: Determined by paint manufacturer and dependent on surface density and type of coating.
  3. Surface Specified to Receive Water Base Coating: Damp, but free of running water, just prior to application of coating.
- C. Film Thickness and Coverage:
1. Number of Coats:
    - a. Minimum required without regard to coating thickness.
    - b. Additional coats may be required to obtain minimum required paint thickness, depending on method of application, differences in manufacturers' products, and atmospheric conditions.
  2. Application Thickness:
    - a. Do not exceed coating manufacturer's recommendations.
    - b. Measure using a wet film thickness gauge to ensure proper coating thickness during application.
  3. Film Thickness Measurements and Electrical Inspection of Coated Surfaces:
    - a. Perform with properly calibrated instruments.
    - b. Recoat and repair as necessary for compliance with specification.
    - c. Coats are subject to inspection by Engineer and coating manufacturer's representative.
  4. Visually inspect concrete, masonry, nonferrous metal, plastic, and wood surfaces to ensure proper and complete coverage has been attained.
  5. Give particular attention to edges, angles, flanges, and other similar areas, where insufficient film thicknesses are likely to be present, and ensure proper millage in these areas.

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- 6. Apply additional coats as required to achieve complete hiding of underlying coats. Hiding shall be so complete that additional coats would not increase the hiding.

3.07 PROTECTIVE COATINGS SYSTEMS AND APPLICATION SCHEDULE

A. Unless otherwise shown or specified, paint surfaces in accordance with the following application schedule. In the event of discrepancies or omissions in the following, request clarification from Engineer before starting work in question.

B. System No. 6 Exposed Metal—Atmospheric:

Surface Prep.	Paint Material	Min. Coats, Cover
SP 6, Commercial Blast Cleaning	Rust-Inhibitive Primer	1 coat, 2 MDFT
	Alkyd Enamel	2 coats, 4 MDFT

- 1. Use on the following items or areas:
  - a. Exposed metal surfaces, new and existing located inside or outside of structures or exposed to weather, including metal doors and frames, vents, louvers, exterior metal ductwork, flashing, sheet metalwork and miscellaneous architectural metal trim
  - b. Apply surface preparation and primer to surfaces prior to installation. Finish coats need only be applied to surfaces exposed after completion of construction.

C.

D. System No. 21 Skid-Resistant—Concrete:

Surface Prep.	Paint Material	Min. Coats, Cover
In accordance with Paragraph Concrete Surface Preparation	Epoxy Nonskid (Aggregated)	1 coat, 160 SFPG

E. System No. 22 Chemical-Resistant Wall, Heavy-Duty—Concrete:

Surface Prep.	Paint Material	Min. Coats, Cover
In accordance with Paragraph Concrete Surface Preparation	Epoxy Filler/Surfacer	1 coat as required to fill voids and smooth surface; apply to 100 percent of surface.
	High Build Epoxy	1 coat, 160 SFPG
	High Build Epoxy, Gloss	1 coat, 160 SFPG

- 1. Use on the following items or areas:

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- a. Inside wall of the containment area.

F. System No. 25 Exposed FRP, PVC:

Surface Prep.	Paint Material	Min. Coats, Cover
In accordance with Paragraph Plastic and FRP Surface Preparation	Acrylic Latex Semigloss	2 coats, 320 SFPGPC

- 1. Use on the following items or areas:
  - a. All exposed-to-view PVC and CPVC surfaces, and FRP surfaces without integral UV-resistant gel coat, except as noted in System 26, below.
  - b. Degasifier vessels.

G. System No. 26 Exposed FRP:

Surface Prep.	Paint Material	Min. Coats, Cover
In accordance with Paragraph Plastic and FRP Surface Preparation	Semigloss polyamide epoxy: Ameron Amerlock 400, Carboline Carboguard 890EF, or PPG 95-245 Rapid Recoat Pitt-Guard	2 coats, each 4 MDFT

- 1. Use on the following items or areas: All exposed-to-view FRP surfaces of recycle pump and recycle pump base.

3.08 COLORS

- A. Provide as selected by Owner or Engineer.
- B. Proprietary identification of colors is for identification only. Selected manufacturer may supply matches.
- C. Equipment Colors:
  - 1. Equipment includes the machinery or vessel itself plus the structural supports and fasteners and attached electrical conduits.
  - 2. Paint nonsubmerged portions of equipment the same color as the piping it serves, except as itemized below:
    - a. Dangerous Parts of Equipment and Machinery: OSHA Orange.
    - b. Fire Protection Equipment and Apparatus: OSHA Red.
    - c. Radiation Hazards: OSHA Purple.
    - d. Physical hazards in normal operating area and energy lockout devices, including, but not limited to, electrical disconnects for equipment and equipment isolation valves in air and liquid lines under pressure: OSHA Yellow.

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D. Pipe Identification Painting:

1. Color code nonsubmerged metal piping, except electrical conduit. Paint fittings and valves the same color as pipe, except equipment isolation valves.
2. Pipe Color Coding: As shown in table below.
3. On exposed stainless steel piping, apply color 24 inches in length along pipe axis at connections to equipment, valves, or branch fittings, at wall boundaries, and at intervals along piping not greater than 9 feet on center.

E. Pipe System Color Code:

Pipe System	Color
Chlorine, Liquid	Federal Safety Yellow
Chlorine, Residual Sampling	Silver/Gray
Chlorine Solution	Federal Safety Yellow
Chlorine Ejector Water	Silver/Gray
Chlorine Vent	Federal Safety Yellow
Drains	Black
Overflow	Silver/Gray
Plant Service Water	Medium Blue
Potable Water	Light Blue

3.09 FIELD QUALITY CONTROL

A. Testing Equipment:

1. Provide calibrated electronic type dry film thickness gauge to test coating thickness specified in mils.
2. Provide low-voltage wet sponge electrical holiday detector to test completed coating systems, 20 mils dry film thickness or less, except zinc primer, high-build elastomeric coatings, and galvanizing, for pinholes, holidays, and discontinuities, as manufactured by Tinker and Razor, San Gabriel, CA, Model M-1.
3. Provide high-voltage spark tester to test completed coating systems in excess of 20 mils dry film thickness. Unit as recommended by coating manufacturer.

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- B. Testing:
1. Thickness and Continuity Testing:
    - a. Measure coating thickness specified in mils with a magnetic type, dry film thickness gauge, in accordance with SSPC PA 2. Check each coat for correct millage. Do not make measurement before a minimum of 8 hours after application of coating.
    - b. Holiday detect coatings 20 mils thick or less, except zinc primer and galvanizing, with low voltage wet sponge electrical holiday detector in accordance with NACE SP0188.
    - c. Holiday detect coatings in excess of 20 mils dry with high voltage spark tester as recommended by coating manufacturer and in accordance with NACE SP0188.
    - d. After repaired and recoated areas have dried sufficiently, retest each repaired area. Final tests may also be conducted by Engineer.
- C. Inspection: Leave staging and lighting in place until Engineer has inspected surface or coating. Replace staging removed prior to approval by Engineer. Provide additional staging and lighting as requested by Engineer.
- D. Unsatisfactory Application:
1. If item has an improper finish color or insufficient film thickness, clean surface and topcoat with specified paint material to obtain specified color and coverage. Obtain specific surface preparation information from coating manufacturer.
  2. Evidence of runs, bridges, shiners, laps, or other imperfections is cause for rejection.
  3. Repair defects in accordance with written recommendations of coating manufacturer.
- E. Damaged Coatings, Pinholes, and Holidays:
1. Hand or power sand visible areas of chipped, peeled, or abraded paint, and feather edges. Follow with primer and finish coat. Depending on extent of repair and appearance, a finish sanding and topcoat may be required.
  2. Remove rust and contaminants from metal surface. Provide surface cleanliness and profile in accordance with surface preparation requirements for specified paint system.
  3. Feather edges and repair in accordance with recommendations of paint manufacturer.
  4. Apply finish coats, including touchup and damage-repair coats in a manner that will present a uniform texture and color-matched appearance.

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3.10 MANUFACTURER'S SERVICES

- A. In accordance with Section 01 43 33, Manufacturers' Field Services, coating manufacturer's representative shall be present at Site as follows:
1. On first day of application of any coating system.
  2. A minimum of two additional Site inspection visits, each for a minimum of 4 hours, in order to provide Manufacturer's Certificate of Proper Installation.
  3. As required to resolve field problems attributable to or associated with manufacturer's product.
  4. To verify full cure of coating prior to coated surfaces being placed into immersion service.

3.11 CLEANUP

- A. Place cloths and waste that might constitute a fire hazard in closed metal containers or destroy at end of each day.
- B. Upon completion of the Work, remove staging, scaffolding, and containers from Site or destroy in a legal manner.
- C. Remove paint spots, oil, or stains upon adjacent surfaces and floors and leave entire job clean.

3.12 SUPPLEMENTS

- A. The supplements listed below, following "End of Section," are a part of this specification:
1. Paint System Data Sheet (PSDS)
  2. Product Data Sheet (PDS).

**END OF SECTION**

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**PAINT SYSTEM DATA SHEET**

Complete this PSDS for each coating system, include all components of the system (surface preparation, primer, intermediate coats, and finish coats). Include all components of a given coating system on a single PSDS.

Paint System Manufacturer:		
Paint System Number (from Spec.):		
Paint System Title (from Spec.):		
Coating Supplier:		
Representative:		
Surface Preparation:		
<b>Paint Material (Generic)</b>	<b>Product Name/Number (Proprietary)</b>	<b>Min. Coats, Coverage</b>

**PAINT PRODUCT DATA SHEET**

Complete and attach manufacturer’s Technical Data Sheet to this PDS for each product submitted.

Paint System Manufacturer: \_\_\_\_\_

Paint System Name: \_\_\_\_\_

Location To Be Used: \_\_\_\_\_

Provide manufacturer’s recommendations for the following parameters at temperature (F)/relative humidity:

<b>Temperature/RH</b>	<b>50/50</b>	<b>70/30</b>	<b>90/25</b>
Induction Time			
Pot Life			
Shelf Life			
Drying Time			
Curing Time			
Min. Recoat Time			
Max. Recoat Time			

Provide manufacturer’s recommendations for the following:

Mixing Ratio: .

Maximum Permissible Thinning: \_\_\_\_\_

Ambient Temperature Limitations: min.: max.: \_\_\_\_\_

Surface Temperature Limitations: min.: max.: \_\_\_\_\_

Surface Profile Requirements: min.:\_ max.: \_\_\_\_\_

Attach additional sheets detailing manufacturer’s recommended storage requirements and holiday testing procedures.

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**SECTION 09 96 35**  
**CHEMICAL-RESISTANT COATINGS**

**PART 1 GENERAL**

1.01 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:
  - a. List materials in proposed system.
  - b. Manufacturer's product specification.
  - c. Chemical resistance test results for exposure to service conditions.
  - d. Application instructions.
  - e. Configuration details of materials at terminations, construction joints, floor drains, and trenches.
2. Samples: 8" by 10" complete system proposed for use showing thickness and finish.

B. Informational Submittals:

1. Letter from manufacturer stating applicator is qualified to do the Work and meets the quality assurance minimum experience requirements.
2. Sample of warranty, prior to starting the Work.
3. Installation instructions.
4. Field inspection and test reports.
5. Manufacturer's Certificate of Proper Installation, in accordance with Section 01 43 33, Manufacturers' Field Services.
6. Special guarantee.

1.02 QUALITY ASSURANCE

- A. Manufacturer's Experience: Minimum 5 years manufacturing proposed products.
- B. Applicator's Experience: Minimum 3 years applying proposed products.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened containers.
- B. Storage: Maintain materials in clean and dry condition. Follow manufacturer's instructions.

1.04 ENVIRONMENTAL REQUIREMENTS

- A. Temperature: Apply coating only when substrate, ambient air, and coating material are 65 degrees F or above.
- B. Temperature is more than 5 degrees above dew point.
- C. Substrate: Not wet or have standing water.

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- D. Ventilation: Provide during and after application to meet all applicable safety and health regulations.

1.05 EXTRA MATERIALS

- A. Furnish minimum 2 gallons of unopened top-coating material for future use by Owner.

1.06 SPECIAL GUARANTEE

- A. Furnish manufacturer's extended guarantee or warranty, with Owner named as beneficiary, in writing, as special guarantee. Special guarantee shall provide for correction, or at the option of the Owner, removal and replacement of Work specified in this Specification section found defective during a period of one year after the date of Substantial Completion. Duties and obligations for correction or removal and replacement of defective Work as specified in the General Conditions.

**PART 2 PRODUCTS**

2.01 MANUFACTURERS

- A. Sherwin-Williams.  
B. PPG.  
C. Carboline.  
D. Tnemec.

2.02 SERVICE CONDITIONS

- A. Location: Outdoors, exposed to weather.  
1. Surface: Concrete and CMU walls.
- B. Location; Indoors, exposed to chlorine vapors.  
1. Surface: Concrete floors, walls, and vault for chemical storage and handling.  
2. Traffic: Foot, light hand truck, forklifts.
- C. Chemicals Stored in Containment Areas: Hydrochloric acid solutions to 37 percent and Sodium Hypochlorite to 15 percent.

2.03 COATING SYSTEMS

- A. Chemical-Resistant Coatings: A mixture of liquid resin-based material, setting agent, and filler designed to be troweled into place to cure to a hard state.
- B. Mat-Reinforced Vinyl Ester (System CRC-1) for sodium hypochlorite containment areas: Primer, fiberglass mat, saturant, and two trowel-applied coats

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of vinyl ester resin with silica fillers. Finished system thickness 150 mils minimum.

- C. Epoxy (System CRC-2): Primer and one trowel-applied coat of epoxy resin with silica fillers. Finished system thickness 100 mils minimum.

2.04 MIXING

- A. Thoroughly mix until homogeneous following manufacturer's instructions.
- B. Mix only components furnished by coating manufacturer.

**PART 3 EXECUTION**

3.01 EXAMINATION

- A. Surface Preparation:
  - 1. Inspect and provide substrate surfaces prepared in accordance with these Specifications and the printed directions and recommendations of the system manufacturer whose product is to be applied.
  - 2. Provide Engineer minimum 3 working days' advance notice of start of surface preparation and system application Work.
  - 3. Perform Work only in presence of Engineer, unless Engineer grants prior approval to perform Work in Engineer's absence.
- B. Schedule inspection with Engineer in advance for cleaned surfaces and system application Work.

3.02 PREPARATION

- A. In accordance with Section 09 90 00, Painting and Coating and the manufacturer's printed directions and recommendations.
- B. Fill holes and cracks with manufacturer's recommended materials to produce even surface for application of systems.
- C. Concrete Surfaces:
  - 1. Do not begin until 30 calendar days after concrete has been placed.
  - 2. Remove grease, oil, dirt, salts or other chemicals, loose materials, or other foreign matter by solvent, detergent, or other suitable cleaning methods.
  - 3. Brushoff blast clean to remove loose concrete and provide a tooth for binding. Upon approval by Engineer, surface may be acid etched with muriatic acid solution. Approval, subject to producing desired profile.
  - 4. Secure coating manufacturer's recommendations for additional preparation if required for excessive bug holes exposed after blasting.
  - 5. Unless otherwise required for proper adhesion, ensure surfaces are dry prior to painting.

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3.03 APPLICATION

- A. Install coating systems in accordance with manufacturer's printed instructions.
- B. Install coating systems on vertical and horizontal surfaces, including caps, within containment wall for storage tanks, pumps, and piping.
- C. Extend surfacing completely under structures and equipment located within the containment area. Install at construction joints in substrate and floor drains, trenches, and other components within the containment area.

3.04 FIELD QUALITY CONTROL

- A. Inspection:
  - 1. Inspect finished system for complete, uniform coverage of specified area. Evidence of defects include improper thickness, hardness, and appearance.
  - 2. Engineer may require electrical spark test or other tests to be performed by Contractor when evidence of incomplete coverage exists.

3.05 MANUFACTURER'S SERVICES

- A. Provide manufacturer's representative at Site in accordance with Section 01 43 33, Manufacturers' Field Services, for installation assistance, inspection, and Manufacturer's Certificate of Proper Installation.

3.06 APPLICATION SCHEDULE

- A. Unless otherwise shown or specified, apply coatings in accordance with the following application schedule. In the event of discrepancies or omissions in the following, request clarification from Engineer before starting Work in question.
- B. Coating System CRC-1: Use in the following areas:
  - 1. Sodium Hypochlorite containment area walls and floor.

3.07 SUPPLEMENTS

- A. The supplement listed below, following "End of Section," is part of this specification.
  - 1. Corrosion Control Assistance Form.

**END OF SECTION**

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**CORROSION CONTROL ASSISTANCE FORM**

TO: Corrosion Control Specialist. DATE: \_\_\_\_\_  
CH2M HILL

FROM: Name: \_\_\_\_\_ Title: \_\_\_\_\_  
Address: \_\_\_\_\_  
Project Description: \_\_\_\_\_  
Project No.: \_\_\_\_\_

Area Requiring Specific Protection: \_\_\_\_\_

Items to be Coated: \_\_\_\_\_

Site Location: \_\_\_\_\_

**SERVICE CONDITIONS  
(Check Appropriate Items)**

Immersion \_\_\_\_\_ Splash/Spillage \_\_\_\_\_ Chemical Fumes \_\_\_\_\_

Marine/Offshore \_\_\_\_\_ Industrial \_\_\_\_\_ Other \_\_\_\_\_

Chemicals Involved \_\_\_\_\_

New Construction \_\_\_\_\_ Existing Structure \_\_\_\_\_ Uncoated \_\_\_\_\_

Coated \_\_\_\_\_ Coated With (If Known) \_\_\_\_\_

Operating Temp. Range \_\_\_\_\_ Ambient Conditions \_\_\_\_\_

Surface Preparation Possible: Abrasive Blast \_\_\_\_\_

Power Tool Cleaning \_\_\_\_\_ Other \_\_\_\_\_

Other Pertinent Data: \_\_\_\_\_

Feedback Required By (Date): \_\_\_\_\_

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**SECTION 31 23 16**  
**EXCAVATION**

**PART 1 GENERAL**

1.01 DEFINITIONS

- A. Common Excavation: Removal of material not classified as rock excavation.

1.02 SUBMITTALS

- A. Informational Submittals:

1. Excavation Plan, Detailing:
  - a. Methods and sequencing of excavation.
  - b. Proposed locations of stockpiled excavated material.
  - c. Proposed onsite and offsite spoil disposal sites.

1.03 QUALITY ASSURANCE

- A. Provide adequate survey control to avoid unauthorized overexcavation.

1.04 WEATHER LIMITATIONS

- A. Material excavated during inclement weather shall not be used as fill or backfill until after material drains and dries sufficiently for proper compaction.

1.05 SEQUENCING AND SCHEDULING

- A. Dewatering: Conform to applicable requirements of Section 31 23 19.01, Dewatering, prior to initiating excavation.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION**

3.01 GENERAL

- A. Excavate to lines, grades, and dimensions shown and as necessary to accomplish Work. Excavate to within tolerance of plus or minus 0.1 foot, except where dimensions or grades are shown or specified as maximum or minimum. Allow for forms, working space, granular base, topsoil, and similar items, wherever applicable. Trim to neat lines where concrete is to be deposited against earth.
- B. Do not overexcavate without written authorization of Engineer.

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- C. Remove or protect obstructions as shown and as specified in Section 01 50 00, Temporary Facilities and Controls, Article Protection of Work and Property.

## 3.02 UNCLASSIFIED EXCAVATION

- A. Excavation is unclassified. Complete all excavation regardless of the type, nature, or condition of the materials encountered.

## 3.03 CLASSIFIED EXCAVATION

- A. Excavation is classified; see Article Definitions for classifications. Notify Engineer whenever rock is encountered.
- B. Before beginning rock excavation, comply with following requirements:
  - 1. Remove overlying material as common excavation and expose rock surface for examination by Engineer.
  - 2. Demonstrate that removal of remaining material classifies as rock excavation unless waived by Engineer.
  - 3. Assist Engineer with measurement and documentation of rock excavation.

## 3.04 TRENCH WIDTH

- A. Minimum Width of Trenches:
  - 1. Single Pipes, Conduits, Direct-Buried Cables, and Duct Banks:
    - a. Greater than 4-inch Outside Diameter or Width: 18 inches greater than outside diameter or width of pipe, conduit, direct-buried cable, or duct bank.
- B. Maximum Trench Width: Unlimited, unless otherwise shown or specified, or unless excess width will cause damage to existing facilities, adjacent property, or completed Work.

## 3.05 EMBANKMENT AND CUT SLOPES

- A. Shape, trim, and finish cut slopes to conform with lines, grades, and cross-sections shown, with proper allowance for topsoil or slope protection, where shown.
- B. Remove stones and rock that exceed 3-inch diameter and that are loose and may roll down slope. Remove exposed roots from cut slopes.
- C. Round tops of cut slopes in soil to not less than a 6-foot radius, provided such rounding does not extend offsite or outside easements and rights-of-way, or adversely impacts existing facilities, adjacent property, or completed Work.

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3.06 STOCKPILING EXCAVATED MATERIAL

- A. Stockpile excavated material that is suitable for use as fill or backfill until material is needed.
- B. Post signs indicating proposed use of material stockpiled. Post signs that are readable from all directions of approach to each stockpile. Signs should be clearly worded and readable by equipment operators from their normal seated position.
- C. Confine stockpiles to within easements, rights-of-way, and approved work areas. Do not obstruct roads or streets.
- D. Do not stockpile excavated material adjacent to trenches and other excavations, unless excavation side slopes and excavation support systems are designed, constructed, and maintained for stockpile loads.
- E. Do not stockpile excavated materials near or over existing facilities, adjacent property, or completed Work, if weight of stockpiled material could induce excessive settlement.

3.07 DISPOSAL OF SPOIL

- A. Dispose of excavated materials, which are unsuitable or exceed quantity needed for fill or backfill, offsite.

**END OF SECTION**

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**SECTION 31 23 19.01  
DEWATERING**

**PART 1 GENERAL**

1.01 SUBMITTALS

- A. Informational Submittals:
1. Water control plan.
  2. Discharge permits.

1.02 WATER CONTROL PLAN

- A. As a minimum, include:
1. Descriptions of proposed groundwater and surface water control facilities including, but not limited to, equipment; methods; standby equipment and power supply, pollution control facilities, discharge locations to be utilized, and provisions for immediate temporary water supply as required by this section.
  2. Drawings showing locations, dimensions, and relationships of elements of each system.
  3. Design calculations demonstrating adequacy of proposed dewatering systems and components.
- B. If system is modified during installation or operation revise or amend and resubmit Water Control Plan.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION**

3.01 GENERAL

- A. Remove and control water during periods when necessary to properly accomplish Work.

3.02 SURFACE WATER CONTROL

- A. See Section 01 50 00, Temporary Facilities and Controls, Article Temporary Controls.
- B. Remove surface runoff controls when no longer needed.

3.03 DEWATERING SYSTEMS

- A. Provide, operate, and maintain dewatering systems of sufficient size and capacity to permit excavation and subsequent construction in dry and to lower and maintain groundwater level a minimum of 2 feet below the lowest point of excavation. Continuously maintain excavations free of water, regardless of source, and until backfilled to final grade.

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- B. Design and Operate Dewatering Systems:
  - 1. To prevent loss of ground as water is removed.
  - 2. To avoid inducing settlement or damage to existing facilities, completed Work, or adjacent property.
  - 3. To relieve artesian pressures and resultant uplift of excavation bottom.
- C. Provide sufficient redundancy in each system to keep excavation free of water in event of component failure.
- D. Provide 100 percent emergency power backup with automatic startup and switchover in event of electrical power failure.
- E. Provide supplemental ditches and sumps only as necessary to collect water from local seeps. Do not use ditches and sumps as primary means of dewatering.

## 3.04 DISPOSAL OF WATER

- A. Obtain discharge permit for water disposal from authorities having jurisdiction.
- B. Treat water collected by dewatering operations, as required by regulatory agencies, prior to discharge.
- C. Discharge water as required by discharge permit and in manner that will not cause erosion or flooding, or otherwise damage existing facilities, completed Work, or adjacent property.
- D. Remove solids from treatment facilities and perform other maintenance of treatment facilities as necessary to maintain their efficiency.
- E. Groundwater disposal will be to the dry retention area on site. Contractor shall discharge to the catch basin 100 feet from the SE corner of the chemical building, which will convey clean water to the dry retention area. The contractor shall be required to clean the piping of any silt, or debris that has settled in the drainage system.

## 3.05 PROTECTION OF PROPERTY

- A. Make assessment of potential for dewatering induced settlement. Provide and operate devices or systems, including but not limited to reinjection wells, infiltration trenches and cutoff walls, necessary to prevent damage to existing facilities, completed Work, and adjacent property.
- B. Securely support existing facilities, completed Work, and adjacent property vulnerable to settlement due to dewatering operations. Support shall include, but not be limited to, bracing, underpinning, or compaction grouting.

## 3.06 REMEDIATION OF GROUNDWATER DEPLETION

- A. If dewatering reduces quantity or quality of water produced by existing wells, temporarily supply water to affected well owners from other sources. Furnish water of a quality and quantity equal to or exceeding the quality and quantity available to well owner prior to beginning the Work or as satisfactory to each well owner.

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**END OF SECTION**

DEWATERING

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**SECTION 31 23 23.15  
TRENCH BACKFILL**

**PART 1 GENERAL**

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Public Works Association (APWA): Uniform Color Code.
  2. ASTM International (ASTM):
    - a. C33/C33M, Standard Specification for Concrete Aggregates.
    - b. C94/C94M, Standard Specification for Ready-Mixed Concrete.
    - c. C117, Standard Test Method for Materials Finer than 75 Micrometer (No. 200) Sieve in Mineral Aggregates by Washing.
    - d. C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
    - e. C150/C150M, Standard Specification for Portland Cement.
    - f. C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
    - g. C1012/C1012M, Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution.
    - h. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
    - i. D1140, Standard Test Methods for Amount of Material in Soils Finer than No. 200 (75 micrometer) Sieve.
    - j. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>)).
    - k. D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
    - l. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
    - m. D4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
    - n. D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
    - o. D4832, Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.
  3. National Electrical Manufacturers Association (NEMA): Z535.1, Safety Colors.

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## 1.02 DEFINITIONS

- A. Base Rock: Granular material upon which manhole bases and other structures are placed.
- B. Bedding Material: Granular material upon which pipes, conduits, cables, or duct banks are placed.
- C. Imported Material: Material obtained by Contractor from source(s) offsite.
- D. Lift: Loose (uncompacted) layer of material.
- E. Pipe Zone: Backfill zone that includes full trench width and extends from prepared trench bottom to an upper limit above top outside surface of pipe, conduit, cable or duct bank.
- F. Prepared Trench Bottom: Graded trench bottom after excavation and installation of stabilization material, if required, but before installation of bedding material.
- G. Relative Compaction: The ratio, in percent, of the as-compacted field dry density to the laboratory maximum dry density as determined by ASTM D698. Corrections for oversize material may be applied to either as-compacted field dry density or maximum dry density, as determined by Engineer.
- H. Relative Density: As defined by ASTM D4253 and ASTM D4254.
- I. Selected Backfill Material: Material available onsite that Engineer determines to be suitable for a specific use.
- J. Well-Graded: A mixture of particle sizes that has no specific concentration or lack thereof of one or more sizes producing a material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids. Satisfying both of the following requirements, as defined in ASTM D2487:
  - 1. Coefficient of Curvature: Greater than or equal to 1 and less than or equal to 3.
  - 2. Coefficient of Uniformity: Greater than or equal to 4 for materials classified as gravel, and greater than or equal to 6 for materials classified as sand.

## 1.03 SUBMITTALS

- A. Action Submittals:
  - 1. Shop Drawings: Manufacturer's descriptive literature for marking tapes.
  - 2. Samples:
    - a. Trench stabilization material.
    - b. Bedding and pipe zone material.
    - c. Granular drain.

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- d. Granular backfill.
- e. Earth backfill.
- f. Sand(s).

B. Informational Submittals:

- 1. Catalog and manufacturer’s data sheets for compaction equipment.
- 2. Certified Gradation Analysis: Submit not less than 30 days prior to delivery for imported materials or anticipated use for excavated materials, except for trench stabilization material that will be submitted prior to material delivery to Site.
- 3. Controlled Low Strength Material: Certified mix design and test results. Include material types and weight per cubic yard for each component of mix.

**PART 2 PRODUCTS**

2.01 MARKING TAPE

A. Detectable:

- 1. Solid aluminum foil, visible on unprinted side, encased in protective high visibility, inert polyethylene plastic jacket.
- 2. Foil Thickness: Minimum 0.35 mils.
- 3. Laminate Thickness: Minimum 5 mils.
- 4. Width: 3 inches.
- 5. Identifying Lettering: Minimum 1-inch high, permanent black lettering imprinted continuously over entire length.
- 6. Joining Clips: Tin or nickel-coated furnished by tape manufacturer.
- 7. Manufacturers and Products:
  - a. Reef Industries; Terra Tape, Sentry Line Detectable.
  - b. Mutual Industries; Detectable Tape.
  - c. Presco; Detectable Tape.

B. Color: In accordance with APWA Uniform Color Code.

Color*	Facility
Red	Electric power lines, cables, conduit, and lightning cables
Orange	Communicating alarm or signal lines, cables, or conduit
Yellow	Gas, oil, steam, petroleum, or gaseous materials
Green	Sewers and drain lines
Blue	Potable water
Purple	Reclaimed water, irrigation, and slurry lines
*As specified in NEMA Z535.1, Safety Color Code.	

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## 2.02 BEDDING MATERIAL AND PIPE ZONE MATERIAL

- A. Friable, and no clay balls, roots, or other organic material.
- B. Clean or gravelly sand with less than 5 percent passing No. 200 sieve, as determined in accordance with ASTM D1140, or gravel or crushed rock within maximum particle size and other requirements as follows unless otherwise specified.
  - 1. Duct Banks: 3/4-inch maximum particle size.
  - 2. PVC Irrigation System Piping and Ductile Iron Pipe with Polyethylene Wrap: 3/8-inch maximum particle size.
  - 3. Pipe Under 18-Inch Diameter: 3/4-inch maximum particle size, except 1/4 inch for stainless steel pipe, copper pipe, tubing, and plastic pipe under 3-inch diameter.
  - 4. Pipe 18-Inch Diameter and Greater: 1-1/2-inch maximum particle size for ductile iron pipe, concrete pipe, welded steel pipe, and pretensioned or prestressed concrete cylinder pipe.
  - 5. Perforated Pipe: Granular drain material.
  - 6. Conduit and Direct-Buried Cable:
    - a. Sand, clean or clean to silty, less than 12 percent passing No. 200 sieve.
    - b. Individual Particles: Free of sharp edges.
    - c. Maximum Size Particle: Pass a No. 4 sieve.
    - d. If more than 5 percent passes No. 200 sieve, the fraction that passes No. 40 sieve shall be nonplastic as determined in accordance with ASTM D4318.

## 2.03 EARTH BACKFILL

- A. Soil, loam, or other excavated material suitable for use as backfill.
- B. Free from roots or organic matter, refuse, boulders and material larger than 1/2 cubic foot, or other deleterious materials.

## 2.04 SOURCE QUALITY CONTROL

- A. Perform gradation analysis in accordance with ASTM C136 for:
  - 1. Earth backfill, including specified class.
  - 2. Trench stabilization material.
  - 3. Bedding and pipe zone material.
- B. Certify Laboratory Performance of Mix Designs:
  - 1. Controlled low strength material.
  - 2. Concrete.

TRENCH BACKFILL

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**PART 3 EXECUTION**

## 3.01 TRENCH PREPARATION

- A. Water Control:
  - 1. As specified in Section 31 23 19.01, Dewatering.
  - 2. Remove water in a manner that minimizes soil erosion from trench sides and bottom.
  - 3. Provide continuous water control until trench backfill is complete.
- B. Remove foreign material and backfill contaminated with foreign material that falls into trench.

## 3.02 TRENCH BOTTOM

- A. Firm Subgrade: Grade with hand tools, remove loose and disturbed material, and trim off high areas and ridges left by excavating bucket teeth. Allow space for bedding material if shown or specified.
- B. Soft Subgrade: If subgrade is encountered that may require removal to prevent pipe settlement, notify Engineer. Engineer will determine depth of overexcavation, if any required.

## 3.03 TRENCH STABILIZATION MATERIAL INSTALLATION

- A. Rebuild trench bottom with trench stabilization material.
- B. Place material over full width of trench in 6-inch lifts to required grade, providing allowance for bedding thickness.
- C. Compact each lift so as to provide a firm, unyielding support for the bedding material prior to placing succeeding lifts.

## 3.04 BEDDING

- A. Furnish imported bedding material where, in the opinion of Engineer, excavated material is unsuitable for bedding or insufficient in quantity.
- B. Place over full width of prepared trench bottom in two equal lifts when required depth exceeds 8 inches.
- C. Hand grade and compact each lift to provide a firm, unyielding surface.
- D. Minimum Thickness: 4 inches.
- E. Check grade and correct irregularities in bedding material. Loosen top 1 inch to 2 inches of compacted bedding material with a rake or by other means to provide

TRENCH BACKFILL

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a cushion before laying each section of pipe, conduit, direct-buried cable, or duct bank.

- F. Install to form continuous and uniform support except at bell holes, if applicable, or minor disturbances resulting from removal of lifting tackle.
- G. Bell or Coupling Holes: Excavate in bedding at each joint to permit proper assembly and inspection of joint and to provide uniform bearing along barrel of pipe or conduit.

## 3.05 BACKFILL PIPE ZONE

- A. Upper limit of pipe zone shall not be less than following:
  - 1. Pipe: 12 inches, unless shown otherwise.
- B. Restrain pipe, conduit, cables, and duct banks as necessary to prevent their movement during backfill operations.
- C. Place material simultaneously in lifts on both sides of pipe and, if applicable, between pipes, conduit, cables, and duct banks installed in same trench.
  - 1. Pipe 10-Inch and Smaller Diameter: First lift less than or equal to 1/2 pipe diameter.
  - 2. Pipe Over 10-Inch Diameter: Maximum 6-inch lifts.
- D. Thoroughly tamp each lift, including area under haunches, with handheld tamping bars supplemented by “walking in” and slicing material under haunches with a shovel to ensure voids are completely filled before placing each succeeding lift.
- E. Do not use power-driven impact compactors to compact pipe zone material. After full depth of pipe zone material has been placed as specified, compact material by a minimum of three passes with a vibratory plate compactor.

## 3.06 MARKING TAPE INSTALLATION

- A. Continuously install marking tape along centerline of buried piping, on top of last lift of pipe zone material. Coordinate with piping installation drawings.
  - 1. Detectable Marking Tape: Install with nonmetallic piping and waterlines.
  - 2. Nondetectable Marking Tape: Install with metallic piping.

## 3.07 BACKFILL ABOVE PIPE ZONE

- A. General:
  - 1. Process excavated material to meet specified gradation requirements.
  - 2. Adjust moisture content as necessary to obtain specified compaction.

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3. Do not allow backfill to free fall into trench or allow heavy, sharp pieces of material to be placed as backfill until after at least 2 feet of backfill has been provided over top of pipe.
4. Do not use power driven impact type compactors for compaction until at least 4 feet of backfill is placed over top of pipe.
5. Backfill to grade with proper allowances for topsoil, crushed rock surfacing, and pavement thicknesses, wherever applicable.
6. Backfill around structures with same class backfill as specified for adjacent trench, unless otherwise shown or specified.

B. Class A Backfill:

1. Place in lifts of suitable thickness.
2. Mechanically compact each lift prior to placing succeeding lifts.
3. Determine proper lift thickness, type of compaction equipment, method to use, and amount of compaction necessary to prevent settlement.

3.08 REPLACEMENT OF TOPSOIL

- A. Replace topsoil in top 12 inches of backfilled trench.
- B. Maintain finished grade of topsoil even with adjacent area and grade as necessary to restore drainage.

3.09 MAINTENANCE OF TRENCH BACKFILL

- A. After each section of trench is backfilled, maintain surface of backfilled trench even with adjacent ground surface until final surface restoration is completed.
- B. Gravel Surfacing Rock: Add gravel surfacing rock where applicable and as necessary to keep surface of backfilled trench even with adjacent ground surface, and grade and compact as necessary to keep surface of backfilled trenches smooth, free from ruts and potholes, and suitable for normal traffic flow.
- C. Topsoil: Add topsoil where applicable and as necessary to maintain surface of backfilled trench level with adjacent ground surface.
- D. Other Areas: Add excavated material where applicable and keep surface of backfilled trench level with adjacent ground surface.

3.10 SETTLEMENT OF BACKFILL

- A. Settlement of trench backfill, or of fill, or facilities constructed over trench backfill will be considered a result of defective compaction of trench backfill.

**END OF SECTION**

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**SECTION 32 92 00**  
**TURF AND GRASSES**

**PART 1 GENERAL**

1.01 DEFINITIONS

- A. Maintenance Period: Begin maintenance immediately after each area is planted (seed, sod, or sprig) and continue for a period of 8 weeks after all planting under this section is completed.
- B. Satisfactory Stand: Grass or section of grass that has:
  - 1. No bare spots larger than 3 square feet.
  - 2. Not more than 10 percent of total area with bare spots larger than 1 square foot.
  - 3. Not more than 15 percent of total area with bare spots larger than 6 square inches.

1.02 SUBMITTALS

- A. Action Submittals: Product labels/data sheets.
- B. Informational Submittals:
  - 1. Certification of sod; include source and harvest date of sod, and sod seed mix.
  - 2. Description of required maintenance activities and activity frequency.

1.03 DELIVERY, STORAGE, AND PROTECTION

- A. Sod:
  - 1. Do not harvest if sod is excessively dry or wet to the extent survival may be adversely affected.
  - 2. Harvest and deliver sod only after laying bed is prepared for sodding.
  - 3. Roll or stack to prevent yellowing.
  - 4. Deliver and lay within 24 hours of harvesting.
  - 5. Keep moist and covered to protect from drying from time of harvesting until laid.

1.04 WEATHER RESTRICTIONS

- A. Perform Work under favorable weather and soil moisture conditions as determined by accepted local practice.

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1.05 SEQUENCING AND SCHEDULING

- A. Complete Work under this section within 3 days following completion of soil preparation.
- B. Notify Engineer at least 3 days in advance of:
  - 1. Each material delivery.
  - 2. Start of planting activity.

1.06 MAINTENANCE SERVICE

- A. Contractor: Perform maintenance operations during maintenance period to include:
  - 1. Watering: Keep surface moist.
  - 2. Washouts: Repair by filling with topsoil, liming, fertilizing, seeding, and mulching.
  - 3. Mowing: Mow to 2 inches after grass height reaches 3 inches, and mow to maintain grass height from exceeding 3-1/2 inches.

**PART 2 PRODUCTS**

2.01 SOD

- A. Certified, containing grass mix, Species: Bermuda.
- B. Strongly rooted pads, capable of supporting own weight and retaining size and shape when suspended vertically from a firm grasp on upper 10 percent of pad.
  - 1. Grass Height: Normal.
  - 2. Strip Size: Supplier's standard.
  - 3. Soil Thickness: Uniform; 1 inch plus or minus 1/4 inch at time of cutting.
  - 4. Age: Not less than 10 months or more than 30 months.
  - 5. Condition: Healthy, green, moist; free of diseases, nematodes and insects, and of undesirable grassy and broadleaf weeds. Yellow sod, or broken pads, or torn or uneven ends will not be accepted.

**PART 3 EXECUTION**

3.01 PREPARATION

- A. Grade areas to smooth, even surface with loose, uniformly fine texture.
  - 1. Roll and rake, remove ridges, fill depressions to meet finish grades.
  - 2. Limit such Work to areas to be planted within immediate future.
  - 3. Remove debris, and stones larger than 1-1/2-inch diameter, and other objects that may interfere with planting and maintenance operations.

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- B. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface to dry off before seeding. Do not create muddy soil.
- C. Restore prepared areas to specified condition if eroded or otherwise disturbed after preparation and before planting.

## 3.02 FERTILIZER

- A. Apply evenly over area in accordance with manufacturer's instructions. Mix into top 2 inches of topsoil, when applied by broad cast method.
- B. Application Rate: 23 pounds per 1,000 square feet (1,000 pounds per acre).
- C. Fertilizer chemical characteristics shall be appropriate for the type of grass, time of year and environmental conditions at the time of application.

## 3.03 SODDING

- A. Do not plant dormant sod, or when ground is frozen.
- B. Lay sod to form solid mass with tightly fitted joints; butt ends and sides, do not overlap.
  - 1. Stagger strips to offset joints in adjacent courses.
  - 2. Work from boards to avoid damage to subgrade or sod.
  - 3. Tamp or roll lightly to ensure contact with subgrade; work sifted soil into minor cracks between pieces of sod, remove excess to avoid smothering adjacent grass.
  - 4. Complete sod surface true to finished grade, even, and firm.
- C. Fasten sod on slopes to prevent slippage with wooden pins 6 inches long driven through sod into subgrade, until flush with top of sod. Install at sufficiently close intervals to securely hold sod.
- D. Water sod with fine spray immediately after planting. During first week, water daily or more frequently to maintain moist soil to depth of 4 inches.
- E. Apply top dress fertilizer at recommended rate.

## 3.04 FIELD QUALITY CONTROL

- A. 8 weeks after seeding is complete and on written notice from Contractor, Engineer will, within 15 days of receipt, determine if a satisfactory stand has been established.
- B. If a satisfactory stand has not been established, Engineer will make another determination after written notice from Contractor following the next growing season.

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3.05 PROTECTION

- A. Protect from pedestrian traffic by erecting temporary fence around each newly seeded area.

**END OF SECTION**

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**SECTION 33 13 00**  
**DISINFECTION OF WATER UTILITY DISTRIBUTION FACILITIES****PART 1 GENERAL**

## 1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. American Water Works Association (AWWA):
  - a. B300, Hypochlorites.
  - b. B301, Liquid Chlorine.
  - c. B302, Ammonium Sulfate.
  - d. B303, Sodium Chlorite.
  - e. C651, Disinfecting Water Mains.
  - f. C652, Disinfection of Water Storage Facilities.
  - g. C653, Disinfection of Water Treatment Plants.
2. NSF International (NSF):
  - a. NSF/ANSI 61, Drinking Water System Components - Health Effects.
  - b. NSF/ANSI 372, Drinking Water System Components - Lead Content.
3. Standard Methods for the Examination of Water and Wastewater, as published by American Public Health Association, American Water Works Association, and the Water Environment Federation.

## 1.02 SUBMITTALS

A. Informational Submittals:

1. Plan describing and illustrating conformance to appropriate AWWA standards and this Specification.
2. Procedure and plan for cleaning system.
3. Procedures and plans for disinfection and testing.
4. Proposed locations within system where Samples will be taken.
5. Type of disinfecting solution and method of preparation.
6. Certification that employees working with concentrated chlorine solutions or gas have received appropriate safety training.
7. Method of disposal for highly chlorinated disinfecting water.
8. Independent Testing Agency: Certification that testing agency is qualified to perform testing in accordance with AWWA standards, agency requirements, and this Specification.

## 1.03 QUALITY ASSURANCE

A. Independent Testing Agency: Certified in the State of Florida with 10 years' experience in field of water sampling and testing. Agency shall use calibrated

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testing instruments and equipment, and documented standard procedures for performing specified testing.

1.04 SEQUENCING

- A. Commence disinfection after completion of all work specified in Section 43 32 67, Degasifier Packing Replacement and 43 32 70, Degasifier Chemical Clean in Place System:

**PART 2 PRODUCTS**

2.01 GENERAL

- A. Components, Chemicals and Materials in Contact with Water for Human Consumption: Comply with the requirements of the Safe Drinking Water Act and other applicable federal, state, and local requirements. Provide certification by manufacturer or an accredited certification organization recognized by the Authority Having Jurisdiction that components and materials comply with the maximum lead content standard in accordance with NSF/ANSI 61 and NSF/ANSI 372.
1. Use or reuse of components and materials without a traceable certification is prohibited.

2.02 WATER FOR DISINFECTION

- A. Owner will supply potable quality water.

**PART 3 EXECUTION**

3.01 GENERAL

- A. Conform to AWWA C653 for water treatment plants and filters, except as modified in these Specifications.
- B. Contractor's Equipment:
1. Furnish chemicals and equipment, such as pumps and hoses, to accomplish disinfection.
  2. Water used for disinfection may be supplied using a temporary connection to existing distribution system. Provide protection against cross-connections as required by AWWA C651.
- C. Disinfect the following items installed or modified under this Project, intended to hold, transport, or otherwise contact potable water:
1. Degasifier vessels, degasifier packing, and degasifier internals.

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2. Disinfect surfaces of materials that will contact finished water, both during and following construction, using one of the methods described in AWWA C652 and AWWA C653. Disinfect prior to contact with finished water. Take care to avoid recontamination following disinfection.
- D. Prior to application of disinfectants, clean degasifiers of loose and suspended material.
- E. Allow freshwater and disinfectant solution to flow into vessel at a measured rate so chlorine-water solution is at specified strength. Do not place concentrated liquid commercial disinfectant in degasifier before it is filled with water.

### 3.02 DEGASIFIERS

- A. Prior to disinfection, remove foreign material from vessels. Clean using fire hoses and tools suitable for adequate scrubbing and cleaning. Pump or drain scrub water from structures. Contractor to coordinate insertion of slip blanks to isolate the degasifier from the clearwell with plant operational staff to insure no water enters the clearwell during cleaning, media replacement and clean-in-place system installation.
- B. Disinfection Procedure: In accordance with AWWA C653, unless herein modified.
- C. Disinfect the following components: Vessels walls, mist eliminator packing, main packing bed, and all vessel internals.

### 3.03 DISPOSAL OF CHLORINATED WATER

- A. Do not allow flow into a waterway without neutralizing disinfectant residual.
- B. See appendix of AWWA C653 for acceptable neutralization methods.

### 3.04 TESTING

- A. Collection of Samples:
  1. Coordinate activities to allow Samples to be taken in accordance with this Specification.
  2. Provide valves at sampling points.
  3. Provide access to sampling points.
- B. Test Equipment:
  1. Clean containers and equipment used in sampling and make sure they are free of contamination.
  2. Obtain sampling bottles with instructions for handling from an independent testing laboratory.

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- C. Chlorine Concentration Sampling and Analysis:
1. Collect and analyze Samples in accordance with AWWA C653.
  2. Analyze Samples for coliform concentrations in accordance with latest edition of Standard Methods for the Examination of Water and Wastewater.
  3. Sampling points shall be representative and accepted by Engineer.
- D. If minimum Samples required above are bacterially positive, disinfecting procedures and bacteriological testing shall be repeated until bacterial limits are met.

**END OF SECTION**

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**SECTION 40 05 15**  
**PIPING SUPPORT SYSTEMS****PART 1 GENERAL**

## 1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Society of Civil Engineers (ASCE): 7, Minimum Design Loads for Buildings and Other Structures.
  2. American Society of Mechanical Engineers (ASME): B31.1, Power Piping.
  3. ASTM International (ASTM):
    - a. A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
    - b. A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
    - c. E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
  4. International Code Council (ICC):
  5. International Building Code (IBC).
  6. International Mechanical Code (IMC).
  7. Manufacturers' Standardization Society (MSS):
    - a. SP 58, Pipe Hangers and Supports—Materials, Design and Manufacture.
    - b. SP 127, Bracing for Piping Systems Seismic-Wind-Dynamic Design, Selection, and Application.

## 1.02 DEFINITIONS

- A. Wetted or Submerged: Submerged, less than 1 foot above liquid surface, below top of channel wall, under cover or slab of channel or tank, or in other damp locations.

## 1.03 SUBMITTALS

- A. Action Submittals: Catalog information and drawings of piping support system.

## 1.04 DESIGN REQUIREMENTS

- A. General:
1. Design, size, and locate piping support systems throughout facility, whether shown or not.

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2. Piping Smaller than 30 Inches: Supports are shown only where specific types and locations are required; additional pipe supports may be required.
  3. Meet requirements of MSS SP 58 and ASME B31.1 or as modified by this section.
- B. Pipe Support Systems:
1. Design pipe support systems for gravity and thrust loads imposed by weight of pipes or internal pressures, including insulation and weight of fluid in pipes.
  2. Maximum Support Spacing and Minimum Rod Size: In accordance MSS SP 58 Table 3 and Table 4.
- C. Anchoring Devices: Design, size, and space support anchoring devices, including anchor bolts, inserts, and other devices used to anchor support, to withstand shear and pullout loads imposed by loading and spacing on each particular support.
- D. Vertical Sway Bracing: 10-foot maximum centers or as shown.
- E. Existing Support Systems:
1. Use existing support systems to support new piping only if Contractor can show they are adequate for additional load, or if they are strengthened to support additional load.
  2. Use existing pipe supports for piping replaced in the sodium hypochlorite bulk storage and metering pump area if inspection by Contractor indicates that those supports appear to be adequate. Contractor shall inspect supports and recommend which supports should be replaced. Engineer will review recommendations and may then require Contractor to replace those supports using supports specified in this Section. Replacement of existing supports is additional work and not included in the bid.

## PART 2 PRODUCTS

### 2.01 GENERAL

- A. When specified items are not available, fabricate pipe supports of correct material and to general configuration indicated.
- B. Special support and hanger details may be required for cases where standard catalog supports are not applicable.
- C. Materials: Type 316 stainless steel.

### 2.02 HANGERS

- A. Clevis: MSS SP 58, Type 1:

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1. Anvil; Figure 260 for steel pipe and Figure 590 for ductile-iron pipe, sizes 1/2 inch through 30 inches.
  2. Insulated Steel Pipe: Anvil; Figure 260 with insulated saddle system (ISS), sizes 1/2 inch through 16 inches.
  3. B-Line; Figure B3100, sizes 1/2 inch through 30 inches.
- B. Adjustable Swivel Split-Ring Pipe Clamp: MSS SP 58, Type 6:
1. Anvil; Figure 104, sizes 3/4 inch through 8 inches.
  2. B-Line; Figure B3171, sizes 3/4 inch through 8 inches.
- C. Steel Yoke Pipe Rolls and Roller Supports: MSS SP 58, Type 41 or Type 43:
1. Anvil; Figure 181 for sizes 2-1/2 inches through 24 inches, and Figure 171 for sizes 1 inch through 30 inches.
  2. B-Line; Figure B3110 for sizes 2 inches through 24 inches and Figure B3114 for 30 inches.
- D. Pipe Rollers and Supports: MSS SP 58, Type 44:
1. Anvil; Figure 175, sizes 2 inches through 30 inches.
  2. B-Line; Figure B3120, sizes 2 inches through 24 inches.

### 2.03 WALL BRACKETS, SUPPORTS, AND GUIDES

- A. Welded Steel Wall Bracket: MSS SP 58, Type 33 (heavy-duty):
1. Anvil; Figure 199, 3,000-pound rating.
  2. B-Line; Figure B3067, 3,000-pound rating.
- B. Adjustable "J" hanger MSS SP 58, Type 5:
1. Anvil; Figure 67, sizes 1/2 inch through 8 inches.
  2. B-Line; Figure B3690, sizes 1/2 inch through 8 inches.
- C. Offset Pipe Clamp: Anvil; Figure 103, sizes 3/4 inch through 8 inches.
- D. Channel Type:
1. Unistrut.
  2. Anvil; Power-Strut.
  3. B-Line; Strut System.
  4. Aickinstrut (FRP).

### 2.04 PIPE SADDLES

- A. Provide 90-degree to 120-degree pipe saddle for pipe 6 inches and larger with baseplates drilled for anchors bolts.

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B. Saddle Supports, Pedestal Type:

1. Minimum standard weight pipe stanchion, saddle, and anchoring flange.
2. Nonadjustable Saddle: MSS SP , Type 37 with U-bolt.
  - a. Anvil; Figure 259, sizes 4 inches through 36 inches with Figure 63C base.
  - b. B-Line; Figure B3095, sizes 1 inch through 36 inches with B3088S base.
3. Adjustable Saddle: MSS SP 58, Type 38 without clamp.
  - a. Anvil; Figure 264, sizes 2-1/2 inches through 36 inches with Figure 62C base.
  - b. B-Line; Figure B3092, sizes 3/4 inch through 36 inches with Figure B3088S base.

2.05 CHANNEL TYPE SUPPORT SYSTEMS

- A. Channel Size: 12-gauge, 1-5/8-inch wide minimum steel, or 1-1/2-inch wide, minimum FRP.
- B. Members and Connections: Design for loads using one-half of manufacturer's allowable loads.
- C. Fasteners: Vinyl ester fiber, polyurethane base composite nuts and bolts, or encapsulated steel fasteners.
- D. Manufacturers and Products:
  1. B-Line; Strut System.
  2. Unistrut.
  3. Anvil; Power-Strut.
  4. Aickinstrut (FRP System).
  5. Enduro-Durostrut (FRP Systems).

2.06 PIPE CLAMPS

- A. Riser Clamp: MSS SP 58, Type 8.
  1. Anvil; Figure 261, sizes 3/4 inch through 24 inches.
  2. B-Line; Figure B3373, sizes 1/2 inch through 30 inches.

2.07 ELBOW AND FLANGE SUPPORTS

- A. Elbow with Adjustable Stanchion: Sizes 2 inches through 18 inches, Anvil; Figure 62C base.
- B. Elbow with Nonadjustable Stanchion: Sizes 2-1/2 inches through 42 inches, Anvil; Figure 63A or Figure 63B base.

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- C. Flange Support with Adjustable Base: Sizes 2 inches through 24 inches, Standon; Model S89.

2.08 ACCESSORIES

A. Anchor Bolts:

1. Size and Material: Sized by Contractor for required loads, 1/2-inch minimum diameter, Type 316 stainless steel.
2. Bolt Length (Extension Above Top of Nut):
  - a. Minimum Length: Flush with top of nut preferred. If not flush, shall be no more than one thread recessed below top of nut.
  - b. Maximum Length: No more than a full nut depth above top of nut.

B. Plastic Pipe Support Channel:

1. Type: Continuous support for plastic pipe and to increase support spacing.
2. Manufacturer and Product: B-Line; Figure Series B3106V, sizes 1/2 inch through 6 inches with Figure B3106 Vee bottom hanger.

- C. Hanger Rods, Clevises, Nuts, Sockets, and Turnbuckles: In accordance with MSS SP 58.

D. Attachments:

1. I-Beam Clamp: Concentric loading type, MSS SP 58, Type 21, Type 28, Type 29, or Type 30, which engage both sides of flange.
2. Concrete Insert: MSS SP 58, Type 18, continuous channel insert with load rating not less than that of hanger rod it supports.
3. Welded Beam Attachment: MSS SP 58, Type 22.
  - a. Anvil; Figure 66.
  - b. B-Line; Figure B3083.
4. U-Channel Concrete Inserts: Type PS 349 Series by Power-Strut, Wayne, MI.
5. Concrete Attachment Plates:
  - a. Anvil; Figure 47, Figure 49, or Figure 52.
  - b. B-Line; Figure B3084, Figure B3085, or Figure B3086.

**PART 3 EXECUTION**

3.01 INSTALLATION

A. General:

1. Install support systems in accordance with MSS SP 58, unless shown otherwise.
2. Install pipe hanger rods plumb, within 4 degrees of vertical during shut down, start up or operations.

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3. Support piping connections to equipment by pipe support and not by equipment.
4. Support large or heavy valves, fittings, and appurtenances independently of connected piping.
5. Support no pipe from pipe above it.
6. Support pipe at changes in direction or in elevation, adjacent to flexible joints and couplings, and where shown.
7. Do not use adhesive anchors for attachment of supports to ceiling or walls.
8. Do not install pipe supports and hangers in equipment access areas or bridge crane runs.
9. Brace hanging pipes against horizontal movement by both longitudinal and lateral sway bracing and to reduce movement after startup.
10. Install lateral supports for seismic loads at changes in direction.
11. Install pipe anchors where required to withstand expansion thrust loads and to direct and control thermal expansion.
12. Repair mounting surfaces to original condition after attachments are completed.

B. Standard Pipe Supports:

1. Horizontal Suspended Piping:
  - a. Single Pipes: Clevis hangers or adjustable swivel split-ring.
  - b. Grouped Pipes: Trapeze hanger system.
2. Horizontal Piping Supported from Walls:
  - a. Single Pipes: Wall brackets, or attached to wall, or to wall mounted framing with anchors.
  - b. Stacked Piping: Wall mounted framing system and "J" hangers acceptable for pipe smaller than 3-inch.
  - c. Pipe clamp that resists axial movement of pipe through support is not acceptable. Use pipe rollers supported from wall bracket.
3. Horizontal Piping Supported from Floors:
  - a. Saddle Supports:
    - 1) Pedestal Type, elbow and flange.
    - 2) Provide minimum 1-1/2-inch grout beneath baseplate.
  - b. Floor Mounted Channel Supports:
    - 1) Use for pipe smaller than 3-inch running along floors and in trenches at pipe elevations lower than can be accommodated using pedestal pipe supports.
    - 2) Attach channel framing to floors with baseplate on minimum 1-1/2-inch nonshrink grout and with anchor bolts.
    - 3) Attach pipe to channel with clips or pipe clamps.
  - c. Concrete Cradles: Use for pipe larger than 3 inches along floor and in trenches at pipe elevations lower than can be accommodated using stanchion type.
4. Vertical Pipe: Support with wall bracket and elbow support, or riser clamp on floor penetration.

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C. Standard Attachments:

1. Existing Concrete Ceilings: Channel type support with minimum of two anchor points, concrete attachment plates or concrete anchors as limited below:
  - a. Single point attachment to ceiling is allowed only for 3/4-inch rod and smaller (8 inches and smaller pipe).
  - b. Where there is vibration or bending considerations do not connect a single pipe support hanger rod directly to a drilled concrete anchor (single point attachment) regardless of size.
2. Steel Beams: I-beam clamp or welded attachments.
3. Wooden Beams: Lag screws and angle clips to members not less than 2-1/2 inches thick.
4. Concrete Walls: Concrete inserts or brackets or clip angles with concrete anchors.
5. Concrete Beams: Concrete inserts, or if inserts are not used attach to vertical surface similar to concrete wall. Do not drill into beam bottom.

**END OF SECTION**

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**SECTION 40 27 00**  
**PROCESS PIPING—GENERAL**

**PART 1 GENERAL**

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section and any supplemental Data Sheets:
1. Air Force: A-A-58092, Tape, Antiseize, Polytetrafluorethylene.
  2. American Association of State Highway and Transportation Officials (AASHTO): HB-17, Standard Specifications for Highway Bridges.
  3. American Petroleum Institute (API): SPEC 5L, Specification for Line Pipe.
  4. American Society of Mechanical Engineers (ASME):
    - a. Boiler and Pressure Vessel Code, Section IX, Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators.
    - b. B1.20.1, Pipe Threads, General Purpose (Inch).
    - c. B16.1, Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250.
    - d. B16.3, Malleable Iron Threaded Fittings Classes 150 and 300.
    - e. B16.5, Pipe Flanges and Flanged Fittings NPS 1/2 through NPS 24 Metric/Inch Standard.
    - f. B16.9, Factory-Made Wrought Buttwelding Fittings.
    - g. B16.11, Forged Fittings, Socket-Welding and Threaded.
    - h. B16.15, Cast Copper Alloy Threaded Fittings Classes 125 and 250.
    - i. B16.21, Nonmetallic Flat Gaskets for Pipe Flanges.
    - j. B16.22, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
    - k. B16.24, Cast Copper Alloy Pipe Flanges and Flanged Fittings Classes 150, 300, 600, 900, 1500, and 2500.
    - l. B16.25, Buttwelding Ends.
    - m. B16.42, Ductile Iron Pipe Flanges and Flanged Fittings Classes 150 and 300.
    - n. B31.1, Power Piping.
    - o. B31.3, Process Piping.
    - p. B31.9, Building Services Piping.
    - q. B36.10M, Welded and Seamless Wrought Steel Pipe.
  5. American Society for Nondestructive Testing (ASNT): SNT-TC-1A, Recommended Practice for Personal Qualification and Certification in Nondestructive Testing.
  6. American Water Works Association (AWWA):
    - a. C104/A21.4, Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.

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- b. C105/A21.5, Polyethylene Encasement for Ductile-Iron Pipe Systems.
  - c. C110/A21.10, Ductile-Iron and Gray-Iron Fittings.
  - d. C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
  - e. C115/A21.15, Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
  - f. C151/A21.51, Ductile-Iron Pipe, Centrifugally Cast.
  - g. C153/A21.53, Ductile-Iron Compact Fittings.
  - h. C207, Steel Pipe Flanges for Waterworks Service, Sizes 4 In. Through 144 In. (100 mm Through 3,600 mm).
  - i. C606, Grooved and Shouldered Joints.
7. American Welding Society (AWS):
- a. Brazing Handbook.
  - b. A5.8M/A5.8, Specification for Filler Metals for Brazing and Braze Welding.
  - c. D1.1/D1.1M, Structural Welding Code - Steel.
  - d. QC1, Standard for AWS Certification of Welding Inspectors.
8. ASTM International (ASTM):
- a. A47/A47M, Standard Specification for Ferritic Malleable Iron Castings.
  - b. A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - c. A105/A105M, Standard Specification for Carbon Steel Forgings for Piping Applications.
  - d. A106/A106M, Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service.
  - e. A126, Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
  - f. A135/A135M, Standard Specification for Electric-Resistance-Welder Steel Pipe.
  - g. A139/A139M, Standard Specification for Electro-Fusion (Arc)-Welded Steel Pipe (NPS 4 Inches and Over).
  - h. A153/A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - i. A181/A181M, Standard Specification for Carbon Steel Forgings, for General-Purpose Piping.
  - j. A182/A182M, Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.
  - k. A183, Standard Specification for Carbon Steel Track Bolts and Nuts.
  - l. A193/A193M, Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.

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- m. A194/A194M, Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
- n. A197/A197M, Standard Specification for Cupola Malleable Iron.
- o. A216/A216M, Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service.
- p. A234/A234M, Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
- q. A240/A240M, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
- r. A276, Standard Specification for Stainless Steel Bars and Shapes.
- s. A269, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- t. A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
- u. A312/A312M, Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
- v. A320/A320M, Standard Specification for Alloy-Steel and Stainless Steel Bolting for Low-Temperature Service.
- w. A351/A351M, Standard Specification for Castings, Austenitic, for Pressure-Containing Parts.
- x. A395/A395M, Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures.
- y. A403/A403M, Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings.
- z. A409/A409M, Standard Specification for Welded Large Diameter Austenitic Steel Pipe for Corrosive or High-Temperature Service.
- aa. A536, Standard Specification for Ductile Iron Castings.
- bb. A563, Standard Specification for Carbon and Alloy Steel Nuts.
- cc. A587, Standard Specification for Electric-Resistance-Welded Low-Carbon Steel Pipe for the Chemical Industry.
- dd. A743/A743M, Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application.
- ee. A744/A744M, Standard Specification for Castings, Iron-Chromium-Nickel, Corrosion Resistant, for Severe Service.
- ff. A774/A774M, Standard Specification for As-Welded Wrought Austenitic Stainless Steel Fittings for General Corrosive Service at Low and Moderate Temperatures.
- gg. A778, Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products.
- hh. B32, Standard Specification for Solder Metal.
- ii. B43, Standard Specification for Seamless Red Brass Pipe, Standard Sizes.

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- jj. B61, Standard Specification for Steam or Valve Bronze Castings.
- kk. B62, Standard Specification for Composition Bronze or Ounce Metal Castings.
- ll. B75/B75M, Standard Specification for Seamless Copper Tube.
- mm. B88, Standard Specification for Seamless Copper Water Tube.
- nn. B98/B98M, Standard Specification for Copper-Silicon Alloy Rod, Bar and Shapes.
- oo. B462, Standard Specification for Forged or Rolled UNS N06030, UNS N06022, UNS N06035, UNS N06200, UNS N06059, UNS N10362, UNS N06686, UNS N08020, UNS N08024, UNS N08026, UNS N08367, UNS N10276, UNS N10665, UNS N10675, UNS N10629, UNS N08031, UNS N06045, UNS N06025, and UNS R20033 Alloy Pipe Flanges, Forged Fittings, and Valves and Parts for Corrosive High-Temperature Service.
- pp. B464, Standard Specification for Welded UNS N08020 Alloy Pipe.
- qq. B474, Standard Specification for Electric Fusion Welded Nickel and Nickel Alloy Pipe.
- rr. C582, Standard Specification for Contact-Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion-Resistant Equipment.
- ss. D412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
- tt. D413, Standard Test Methods for Rubber Property-Adhesion to Flexible Substrate.
- uu. D543, Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents.
- vv. D1248, Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.
- ww. D1330, Standard Specification for Rubber Sheet Gaskets.
- xx. D1784, Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
- yy. D1785, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
- zz. D2000, Standard Classification System for Rubber Products in Automotive Applications.
- aaa. D2310, Standard Classification for Machine-Made "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe.
- bbb. D2464, Standard Specification for Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
- ccc. D2466, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
- ddd. D2467, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.

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- eee. D2564, Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.
  - fff. D2837, Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products.
  - ggg. D2996, Standard Specification for Filament-Wound “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe.
  - hhh. D3222, Standard Specification for Unmodified Poly(Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials.
  - iii. D3350, Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
  - jjj. D4101, Standard Specification for Polypropylene Injection and Extrusion Materials.
  - kkk. D4894, Standard Specification for Polytetrafluoroethylene (PTFE) Granular Molding and Ram Extrusion Materials.
  - lll. D4895, Standard Specification for Polytetrafluoroethylene (PTFE) Resin Produced from Dispersion.
  - mmm. F423, Standard Specification for Polytetrafluoroethylene (PTFE) Plastic-Lined Ferrous Metal Pipe, Fittings, and Flanges.
  - nnn. F436, Standard Specification for Hardened Steel Washers.
  - ooo. F437, Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
  - ppp. F439, Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
  - qqq. F441/F441M, Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.
  - rrr. F493, Standard Specification for Solvent Cements for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.
  - sss. F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
  - ttt. F656, Standard Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
9. FM Global (FM).
  10. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS): SP-43, Wrought and Fabricated Butt-Welding Fittings for Low-Pressure, Corrosion Resistant Applications.
  11. NSF International (NSF):
    - a. ANSI 61: Drinking Water System Components - Health Effects.
    - b. ANSI 372: Drinking Water System Components - Lead Content.
  12. National Electrical Manufacturers Association (NEMA): LI 1, Industrial Laminating Thermosetting Products.
  13. National Fire Protection Association (NFPA): 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances.

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1.02 SUBMITTALS

A. Informational Submittals:

1. Manufacturer's Certification of Compliance, in accordance with Section 01 61 00, Common Product Requirements:
  - a. Pipe and fittings.

**PART 2 PRODUCTS**

2.01 GENERAL

- A. Components, Chemicals and Materials in Contact with Water for Human Consumption: Comply with the requirements of the Safe Drinking Water Act and other applicable federal, state, and local requirements. Provide certification by manufacturer or an accredited certification organization recognized by the Authority Having Jurisdiction that components and materials comply with the maximum lead content standard in accordance with NSF/ANSI 61 and NSF/ANSI 372.

1. Use or reuse of components and materials without a traceable certification is prohibited.

2.02 PIPING

- A. All piping on this project shall be CPVC per Section 40 27 00.11 unless noted otherwise on the Drawings.
- B. Diameters Shown:
1. Standardized Products: Nominal size.

**PART 3 EXECUTION**

3.01 EXAMINATION

- A. Verify size, material, joint types, elevation, horizontal location, and pipe service of existing pipelines to be connected to new pipelines or new equipment.
- B. Inspect size and location of structure penetrations to verify adequacy of wall pipes, sleeves, and other openings.

3.02 PREPARATION

- A. See Section 09 90 00, Painting and Coating, for additional requirements.
- B. Inspect pipe and fittings before installation, clean ends thoroughly, and remove foreign matter and dirt from inside.

PROCESS PIPING—GENERAL

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## 3.03 INSTALLATION—GENERAL

- A. Join pipe and fittings in accordance with manufacturer's instructions, unless otherwise shown or specified.
- B. Remove foreign objects prior to assembly and installation.
- C. Flanged Joints:
  - 1. Install perpendicular to pipe centerline.
  - 2. Bolt Holes: Straddle vertical centerlines, aligned with connecting equipment flanges or as shown.
  - 3. Use torque-limiting wrenches to ensure uniform bearing and proper bolt tightness.
  - 4. Plastic Flanges: Install annular ring filler gasket at joints of raised-face flange.
  - 5. Raised-Face Flanges: Use flat-face flange when joining with flat-faced ductile or cast iron flange.
  - 6. Manufacturer: Same as pipe manufacturer.
- D. PVC and CPVC Piping:
  - 1. Provide Schedule 80 threaded nipple where necessary to connect to threaded valve or fitting.
  - 2. Use strap wrench for tightening threaded plastic joints. Do not overtighten fittings.
  - 3. Do not thread Schedule 40 pipe.

## 3.04 INSTALLATION—EXPOSED PIPING

- A. Piping Runs:
  - 1. Parallel to building or column lines and perpendicular to floor, unless shown otherwise.
  - 2. Piping upstream and downstream of flow measuring devices shall provide straight lengths as required for accurate flow measurement.
- B. Supports: As specified in Section 40 05 15, Piping Support Systems.
- C. Group piping wherever practical at common elevations; install to conserve building space and not interfere with use of space and other work.
- D. Unions or Flanges: Provide at each piping connection to equipment or instrumentation on equipment side of each block valve to facilitate installation and removal.

## PROCESS PIPING—GENERAL

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- E. Install piping so that no load or movement in excess of that stipulated by equipment manufacturer will be imposed upon equipment connection; install to allow for contraction and expansion without stressing pipe, joints, or connected equipment.
- F. Piping clearance, unless otherwise shown:
1. Over Walkway and Stairs: Minimum of 7 feet 6 inches, measured from walking surface or stair tread to lowest extremity of piping system including flanges, valve bodies or mechanisms, insulation, or hanger/support systems.
  2. Between Equipment or Equipment Piping and Adjacent Piping: Minimum 3 feet, measured from equipment extremity and extremity of piping system including flanges, valve bodies or mechanisms, insulation, or hanger/support systems.
  3. From Adjacent Work: Minimum 1 inch from nearest extremity of completed piping system including flanges, valve bodies or mechanisms, insulation, or hanger/support systems.
  4. Do not route piping in front of or to interfere with access ways, ladders, stairs, platforms, walkways, openings, doors, or windows.
  5. Headroom in front of openings, doors, and windows shall not be less than the top of the opening.
  6. Do not install piping containing liquids or liquid vapors in transformer vaults or electrical equipment rooms.
  7. Do not route piping over, around, in front of, in back of, or below electrical equipment including controls, panels, switches, terminals, boxes, or other similar electrical work.

### 3.05 INSTALLATION—BURIED PIPE

- A. Placement:
1. Keep trench dry until pipe laying and joining are completed.
  2. Pipe Base and Pipe Zone: As specified in Section 31 23 23.15, Trench Backfill.
  3. Exercise care when lowering pipe into trench to prevent twisting or damage to pipe.
  4. Measure for grade at pipe invert, not at top of pipe.
  5. Excavate trench bottom and sides of ample dimensions to permit visual inspection and testing of entire flange, valve, or connection.
  6. Prevent foreign material from entering pipe during placement.
  7. Close and block open end of last laid pipe section when placement operations are not in progress and at close of day's work.
  8. After joint has been made, check pipe alignment and grade.
  9. Place sufficient pipe zone material to secure pipe from movement before next joint is installed.
  10. Prevent uplift and floating of pipe prior to backfilling.

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## B. PVC, CPVC, or HDPE Pipe Placement:

1. Lay pipe snaking from one side of trench to other, except for PVC.
2. Offset: As recommended by manufacturer for maximum temperature variation between time of solvent welding and during operation.
3. Do not lay pipe when temperature is below 40 degrees F, or above 90 degrees F when exposed to direct sunlight.
4. Shield ends to be joined from direct sunlight prior to and during the laying operation.

## 3.06 PIPE CORROSION PROTECTION

A. PVC and CPVC Pipe, Exposed: As specified in Section 09 90 00, Painting and Coating.

## B. Piping Accessories:

1. Exposed:
  - a. Field paint black and galvanized steel, brass, copper, and bronze piping components as specified in Section 09 90 00, Painting and Coating, as applicable to base metal material.
  - b. Accessories include, but are not limited to, pipe hangers, supports, expansion joints, pipe guides, flexible couplings, vent and drain valves, and fasteners.
2. Buried:
  - a. Ferrous Metal and Stainless Steel Components: Coat with coal-tar epoxy as specified in Section 09 90 00, Painting and Coating.
  - b. Bolts, Nuts, and Similar Items: Coat with bituminous paint.
  - c. Flexible Couplings and Similar Items: Wrap with heat shrink wrap.

## 3.07 BRANCH CONNECTIONS

A. Do not install branch connections smaller than 1/2-inch nominal pipe size, including instrument connections, unless shown otherwise.

B. When line of lower pressure connects to a line of higher pressure, requirements for higher pressure rating prevails up to and including first block valve in the line carrying the lower pressure, unless otherwise shown.

## 3.08 VENTS AND DRAINS

A. Vents and drains at high and low points in piping required for completed system may or may not be shown. Install vents on high points and drains on low points of pipelines at all low and high point locations.

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3.09 DISINFECTION

A. See Section 33 13 00, Disinfection of Water Utility Distribution Facilities.

3.10 FIELD FINISHING

A. Notify Engineer at least 3 days prior to start of surface preparation or coating application work.

B. As specified in Section 09 90 00, Painting and Coating.

3.11 PIPE IDENTIFICATION

A. As specified in Section 09 90 00, Painting and Coating.

3.12 FIELD QUALITY CONTROL

A. Pressure Leakage Testing: After installation and cleaning, hydrostatically test all piping specified by this Section at a pressure of 50 psig for a period of 3 hours. Test shall be witnessed by Engineer.

3.13 CLEANING

A. Following assembly and testing, and prior to final acceptance, flush pipelines with water at 2.5 fps minimum flushing velocity until foreign matter is removed.

B. Insert cone strainers in flushing connections to attached equipment and leave in-place until cleaning is complete.

C. Remove accumulated debris through drains 2 inches and larger or by removing spools and valves from piping.

3.14 SUPPLEMENTS

A. The supplements listed below, following “End of Section,” are a part of this Specification:

1. Data Sheets.

Number	Title
40 27 00.11	Chlorinated Polyvinyl Chloride (CPVC) Pipe and Fittings

**END OF SECTION**

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<b>SECTION 40 27 00.11 CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE AND FITTINGS</b>		
<b>Item</b>	<b>Size</b>	<b>Description</b>
Pipe	All  2 inch and Smaller 2-1/2 inch and Larger	CPVC: Type IV, Grade I or Class 23447-B conforming to ASTM D1784 and ASTM F441/F441M. Pipe shall be manufactured with titanium dioxide for ultraviolet protection.  Schedule 80 Schedule 40
Fittings	All	Schedule to Match Pipe Above: Conforming to the requirements of ASTM F439 for socket weld type and Schedule 80 ASTM F437 for threaded type. Fittings shall be manufactured with titanium dioxide for ultraviolet protection.
Joints	All	Solvent socket weld except where connection to threaded valves and equipment may require future disassembly. Pipe that may require future disassembly shall use threaded unions at these locations.
Flanges	All	One piece, molded hub Type CPVC flat face flange in accordance with Fittings above; ASME B16.1, Class 125 drilling.
Bolting	All	Flat Face Mating Flange and In Corrosive Areas: ASTM A193/A193M, Type 316 stainless steel Grade B8M hex head bolts, ASTM A194/A194M Grade 8M hex head nuts and ASTM F436 Type 3 alloy washers at nuts and bolt heads. Achieve 40 percent to 60 percent of bolt minimum yield stress.  Raised Face Mating Flange: Carbon steel ASTM A307 Grade B square head bolts, ASTM A563 Grade A heavy hex head nuts and ASTM F436 hardened steel washers at nuts and bolt heads. Achieve 40 percent to 60 percent of bolt minimum yield stress.

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<b>SECTION 40 27 00.11 CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE AND FITTINGS</b>		
<b>Item</b>	<b>Size</b>	<b>Description</b>
Gaskets	All	<p>Flat Face Mating Flange: Full faced 1/8-inch-thick ethylene propylene diene monomer (EPDM).</p> <p>Raised Face Mating Flange: Flat ring 1/8-inch ethylene propylene diene monomer (EPDM), with filler gasket between OD of raised face and flange OD to protect the flange from bolting moment. All gaskets to be NSF or Food Grade.</p>
Solvent Cement	All	<p>All socket type joints shall be made employing primer and solvent cements that meet or exceed the requirements of ASTM F493 and primers that meet or exceed the requirements of ASTM F656, resistant to the fluid service, and as recommended by the pipe and fitting manufacturer, except solvent weld cement for CPVC pipe joints in sodium hypochlorite service shall be free of silica filler and shall be certified by the manufacturer to be suitable for that service, IPS Weld-On 724 or approved equal. Certification shall be submitted. Solvent cement and primer shall be listed by NSF 61 for contact with potable water and other chemicals.</p>
Thread Lubricant	All	Teflon tape.

**END OF SECTION**

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**SECTION 40 27 01**  
**PROCESS PIPING SPECIALTIES**

**PART 1 GENERAL**

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Society of Mechanical Engineers (ASME):
    - a. B16.1, Gray Iron Pipe Flanges and Flanged Fittings (Classes 25, 125, and 250).
    - b. B16.5, Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard.
  2. American Water Works Association (AWWA):
    - a. C110/A21.10, Ductile-Iron and Gray-Iron Fittings.
    - b. C153/A21.53, Ductile-Iron Compact Fittings for Water Service.
    - c. C210, Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.
    - d. C213, Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.
    - e. C219, Bolted, Sleeve-Type Couplings for Plain-End Pipe.
    - f. Manual M11, Steel Pipe—A Guide for Design and Installation.
  3. ASTM International (ASTM):
    - a. A153/A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
    - b. A276, Standard Specification for Stainless Steel Bars and Shapes.
  4. National Fire Protection Association (NFPA): 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances.
  5. NSF International (NSF):
    - a. NSF/ANSI 61, Drinking Water System Components - Health Effects.
    - b. NSF/ANSI 372, Drinking Water System Components - Lead Content.

1.02 SUBMITTALS

- A. Action Submittals: Manufacturer's data on materials, construction, end connections, ratings, overall lengths, and live lengths (as applicable).
- B. Operation and Maintenance Data as specified in Section 1 78 23, Operation and Maintenance Data.

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**PART 2 PRODUCTS**

## 2.01 GENERAL

- A. Provide required piping specialty items, whether shown or not shown on Drawings, as required by applicable codes and standard industry practice.
- B. Rubber ring joints, mechanical joints, flexible couplings, and proprietary restrained ductile iron pipe joints are considered flexible joints; welded, screwed, and flanged pipe joints are not considered flexible.
- C. Components and Materials in Contact with Water for Human Consumption: Comply with the requirements of the Safe Drinking Water Act and other applicable federal, state, and local requirements. Provide certification by manufacturer or an accredited certification organization recognized by the Authority Having Jurisdiction that components and materials comply with the maximum lead content standard in accordance with NSF/ANSI 61 and NSF/ANSI 372.
  1. Use or reuse of components and materials without a traceable certification is prohibited.

## 2.02 CONNECTORS

- A. Teflon Bellows Connector:
  1. Type: Two convolutions, unless otherwise shown, with metal reinforcing bands.
  2. Flanges: Ductile iron, drilled 150 psi ASME B16.5 standard.
  3. Working Pressure Rating: 140 psi, minimum, at 120 degrees F.
  4. Thrust Restraint: Limit bolts to restrain force developed by specified test pressure.
  5. Manufacturers and Products:
    - a. Garlock; Style 214.
    - b. Resistoflex; No. R6904.
    - c. Unisource Manufacturing, Inc.; Style 112.
    - d. Proco Products, Inc.; Series 442.
- B. Quick Connect Couplings for Chemical Services:
  1. Type: Twin cam arm actuated, male and female, locking, for chemical loading and transfer.
  2. Materials: Glass-filled polypropylene or PVDF with EPDM, Viton-A or Teflon gaskets as recommended for the service by manufacturer.
  3. End Connections: NPT threaded or flanged to match piping connections. Hose shank for chemical installations.

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4. Plugs and Caps: Female dust cap for each male end; male dust plug for each female end.
5. Pressure Rating: 125 psi, minimum, at 70 degrees F.
6. Manufacturers and Products:
  - a. OPW; Kamlock.
  - b. Ryan Herco; 1300 Series.

2.03 MISCELLANEOUS SPECIALTIES

A. Strainers, Plastic Piping Systems, 4 Inches and Smaller:

1. Type: Y-pattern, clear PVC body, 150 psi nonshock rated, with screwed PVC cap and Viton seals.
2. End Connections: Screwed or solvent weld, 2 inches and smaller. Class 150 ANSI flanged, 2-1/2 inches and larger.
3. Screen: Heavy-gauge PVC, 1/32-inch mesh, minimum 2 to 1 screen area to pipe size ratio.
4. Manufacturer: Hayward, YS Series.

B. Slip Blank:

1. Type 304 stainless steel, 1/8 inch thick, plain face, integral handle (one-piece construction).
2. Manufacturer: Steinmans LLC.

**PART 3 EXECUTION**

3.01 GENERAL

- A. Provide accessibility to piping specialties for control and maintenance.

3.02 FLEXIBLE PIPE CONNECTIONS

- A. Install to facilitate piping installation.
- B. Install to prevent piping from being supported by equipment, for vibration isolation, and where shown.
- C. Product Applications Unless Shown Otherwise:
1. Nonmetallic Piping: Teflon bellows connector.

**END OF SECTION**

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**SECTION 40 27 02**  
**PROCESS VALVES AND OPERATORS****PART 1 GENERAL**

## 1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Gas Association (AGA): 3, Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids.
  2. American National Standards Institute (ANSI): Z21.15, Manually Operated Gas Valves for Appliances, Appliance Connector Valves and Hose End Valves.
  3. American Society of Mechanical Engineers (ASME):
    - a. B16.1, Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
    - b. B16.44, Manually Operated Metallic Gas Valves for Use in Above Ground Piping Systems up to 5 psi.
  4. American Society of Sanitary Engineers (ASSE): 1011, Performance Requirements for Hose Connection Vacuum Breakers.
  5. American Water Works Association (AWWA):
    - a. C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
    - b. C500, Metal-Seated Gate Valves for Water Supply Service.
    - c. C504, Rubber-Seated Butterfly Valves, 3 In. (75 mm) Through 72 In. (1,800 mm).
    - d. C508, Swing-Check Valves for Waterworks Service, 2-In. Through 24-In. (50-mm Through 600-mm) NPS.
    - e. C509, Resilient-Seated Gate Valves for Water Supply Service.
    - f. C510, Double Check Valve Backflow Prevention Assembly.
    - g. C511, Reduced-Pressure Principle Backflow Prevention Assembly.
    - h. C512, Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service.
    - i. C515, Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service.
    - j. C541, Hydraulic and Pneumatic Cylinder and Vane-Type Actuators for Valves and Slide Gates.
    - k. C542, Electric Motor Actuators for Valves and Slide Gates.
    - l. C550, Protective Interior Coatings for Valves and Hydrants.
    - m. C606, Grooved and Shouldered Joints.
    - n. C800, Underground Service Line Valves and Fittings.
  6. ASTM International (ASTM):
    - a. A276, Standard Specification for Stainless Steel Bars and Shapes.
    - b. A351/A351M, Standard Specification for Castings, Austenitic, for Pressure-Containing Parts.

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- c. A380, Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems.
  - d. A564/A564M, Standard Specification for Hot-Rolled and Cold-Finished Age-Hardening Stainless Steel Bars and Shapes.
  - e. B61, Standard Specification for Steam or Valve Bronze Castings.
  - f. B62, Standard Specification for Composition Bronze or Ounce Metal Castings.
  - g. B98/B98M, Standard Specification for Copper-Silicon Alloy Rod, Bar, and Shapes.
  - h. B127, Standard Specification for Nickel-Copper Alloy (UNS N04400) Plate, Sheet, and Strip.
  - i. B139/B139, Standard Specification for Phosphor Bronze Rod, Bar and Shapes.
  - j. B164, Standard Specification for Nickel-Copper Alloy Rod, Bar, and Wire.
  - k. B194, Standard Specification for Copper-Beryllium Alloy Plate, Sheet, Strip, and Rolled Bar.
  - l. B584, Standard Specification for Copper Alloy Sand Castings for General Applications.
  - m. D429, Standard Test Methods for Rubber Property-Adhesion to Rigid Substrates.
  - n. D1784, Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
7. Canadian Standards Association, Inc. (CSA): 9.1, Manually Operated Gas Valves for Appliances, Appliance Connector Valves and Hose End Valves.
  8. Chlorine Institute (CI): Pamphlet 6, Piping Systems for Dry Chlorine.
  9. FM Global (FM).
  10. Food and Drug Administration (FDA).
  11. International Association of Plumbing and Mechanical Officials (IAPMO).
  12. Manufacturers Standardization Society (MSS):
    - a. SP-80, Bronze Gate, Globe, Angle, and Check Valves.
    - b. SP-81, Stainless Steel, Bonnetless, Flanged Knife Gate Valves.
    - c. SP-85, Gray Iron Globe and Angle Valves, Flanged and Threaded Ends.
    - d. SP-88, Diaphragm Valves.
    - e. SP-110, Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.
  13. National Electrical Manufacturers Association (NEMA): 250, Enclosures for Electrical Equipment (1000 Volts Maximum).
  14. NSF International (NSF):
    - a. NSF/ANSI 61, Drinking Water System Components - Health Effects.
    - b. NSF/ANSI 372, Drinking Water System Components - Lead Content.
  15. Underwriters Laboratories (UL).
  16. USC Foundation for Cross-Connection Control and Hydraulic Research.

## PROCESS VALVES AND OPERATORS

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## 1.02 SUBMITTALS

### A. Action Submittals:

#### 1. Shop Drawings:

- a. Product data sheets for each make and model. Indicate valve Type Number, applicable Tag Number, and facility name/number or service where used.
- b. Complete catalog information, descriptive literature, specifications, and identification of materials of construction.
- c. Certification for compliance to NSF/ANSI 61 for valves used for drinking water service and chemicals.
- d. Power and control wiring diagrams, including terminals and numbers.
- e. For each power actuator provided, manufacturer's standard data sheet, with application specific features and options clearly identified.

## PART 2 PRODUCTS

### 2.01 GENERAL

- A. Valves to include operator, actuator, handwheel, chain wheel, extension stem, floor stand, operating nut, chain, wrench, and accessories to allow a complete operation from the intended operating level.
- B. Valve to be suitable for intended service. Renewable parts not to be of a lower quality than specified.
- C. Valve same size as adjoining pipe, unless otherwise called out on Drawings or in Supplements.
- D. Valve ends to suit adjacent piping.
- E. Resilient seated valves shall have no leakage (drip-tight) in either direction at valve rated design pressure. All other valves shall have no leakage (drip-tight) in either direction at valve rated design pressure, unless otherwise allowed for in this section or in stated valve standard.
- F. Size operators and actuators to operate valve for full range of pressures and velocities.
- G. Valve to open by turning counterclockwise, unless otherwise specified.
- H. Factory mount operator, actuator, and accessories.
- I. Components and Materials in Contact with Water for Human Consumption: Comply with the requirements of the Safe Drinking Water Act and other applicable federal, state, and local requirements. Provide certification by manufacturer or an accredited certification organization recognized by the

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Authority Having Jurisdiction that components and materials comply with the maximum lead content standard in accordance with NSF/ANSI 61 and NSF/ANSI 372.

1. Use or reuse of components and materials without a traceable certification is prohibited.

## 2.02 SCHEDULE

- A. Additional requirements relative to this section are shown on Pneumatic Actuated Valve Schedule.

## 2.03 MATERIALS

- A. Valve materials in contact with or intended for drinking water service and chemicals to meet the following requirements:
  1. Materials to comply with requirements of the Safe Drinking Water Act and other applicable federal, state, and local requirements.
  2. Coatings materials to be formulated from materials deemed acceptable to NSF/ANSI 61.
  3. Supply certification product is certified as suitable for contact with drinking water by an accredited certification organization in accordance with NSF/ANSI 61. Provide certification for each valve type used for drinking water service.

## 2.04 VALVES

## A. Ball Valves:

1. Type V335 CPVC Ball Valve 3 Inches and Smaller:
  - a. Rated 150 psi at 100 degrees F, 80 psi at 140 degrees, with ASTM D1784, Type IV, Grade 1 chlorinated polyvinyl chloride (CPVC) body, ball, and stem, end entry, double union design, with solvent-weld socket ends or single union ball with flanged ends drilled to ASME B16.1, replaceable Teflon seat, Viton or Teflon O-ring stem seals, to block flow in both directions. Provide pressure relief hole drilled on low pressure side of ball.
  - b. Manufacturers and Products:
    - 1) Nibco; Chemtrol Tru-Bloc.
    - 2) ASAHI/America; Type 21.
    - 3) Spears; True Union.

## B. Butterfly Valves:

1. Type V520 Solid Chlorinated Polyvinyl Chloride (CPVC) Butterfly Valve 1-1/2 Inches to 8 Inches:
  - a. Wafer body type, pressure rated 150 psi at 70 degrees F CWP, solid ASTM D1784, Type I, Grade 1, CPVC body and contoured CPVC or

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polypropylene valve disc, stainless steel valve stem, Viton seat, lever operator.

- b. Manufacturers and Products:
  - 1) ASAHI/America.
  - 2) Spears.

C. Check Valves:

- 1. Type V631 CPVC Ball Check Valve 6 Inches and Smaller:
  - a. ASTM D1784 Cell Class 23477B CPVC body, single or dual union socket weld ends for 2-inch and smaller, flanged for 2 1/2-inch and larger, rated 150 psi at 73 degrees F, 110 psi at 140 degrees F, Viton seat and seal.
  - b. Manufacturers and Products:
    - 1) Spears; True Union.
    - 2) Hayward; TC Series.

2.05 OPERATORS AND ACTUATORS

A. Manual Operators:

- 1. General:
  - a. For AWWA valves, operator force not to exceed requirements of applicable valve standard. Provide gear reduction operator when force exceeds requirements.
  - b. Operator self-locking type or equipped with self-locking device.
  - c. Position indicator on quarter-turn valves.
  - d. Worm and gear operators one-piece design, worm-gears of gear bronze material. Worm of hardened alloy steel with thread ground and polished. Traveling nut type operator's threaded steel reach rod with internally threaded bronze or ductile iron nut.
- 2. Exposed Operator:
  - a. Galvanized and painted handwheel.
  - b. Cranks on gear type operator.
  - c. Chain wheel operator with tieback, extension stem, floor stand, and other accessories to permit operation from normal operation level.
  - d. Valve handles to take a padlock, and wheels a chain and padlock.
- 3. Buried Operator:
  - a. Buried service operators on valves larger than 2-1/2 inches shall have a 2-inch AWWA operating nut. Buried operators on valves 2 inches and smaller shall have cross handle for operation by forked key. Enclose moving parts of valve and operator in housing to prevent contact with the soil.
  - b. Buried service operators to be grease packed and gasketed to withstand submersion in water to 20 feet minimum.
  - c. Buried valves shall have extension stems, bonnets, and valve boxes.

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B. Pneumatic Actuators:

1. Valve manufacturer's standard, factory mounted.
2. Air Supply: 80 psig.
3. Actuator complete with air sets, exhaust mufflers, speed controls, pilot solenoids, safety vented isolation valves, and accessories.
4. Suitable for full operation range of valve at air supply pressure indicated.
5. Position indication and stop limiting devices on all actuators.
6. Control Features: Pneumatic actuators with features noted in the Pneumatic Actuated Valve Schedule.

2.06 ACCESSORIES

- A. Tagging: 1-1/2-inch diameter heavy brass or stainless steel tag attached with No. 16 solid brass or stainless steel jack chain for each valve (new or replaced), bearing valve tag number shown on the Drawings.

**PART 3 EXECUTION**

3.01 INSTALLATION

A. Flange Ends:

1. Flanged valve bolt holes shall straddle vertical centerline of pipe.
2. Clean flanged faces, insert gasket and bolts, and tighten nuts progressively and uniformly.

B. Screwed Ends:

1. Clean threads by wire brushing or swabbing.
2. Apply joint compound.

C. CPVC Valves: Install using solvents approved for valve service conditions.

D. Valve Installation and Orientation:

1. General:
  - a. Install valves so handles operate from fully open to fully closed without encountering obstructions.
  - b. Install valves in location for easy access for routine operation and maintenance.
  - c. Install valves per manufacturer's recommendations.
2. Ball Valves:
  - a. Install operating stem vertical when valve is installed in horizontal runs of pipe having centerline elevations 4 feet 6 inches or less above finished floor, unless otherwise shown.

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- b. Install operating stem horizontal in horizontal runs of pipe having centerline elevations greater than 4 feet 6 inches above finish floor, unless otherwise shown.
- 3. Butterfly Valves:
  - a. Unless otherwise restricted or shown on Drawings, install valve a minimum of 8 diameters downstream of a horizontal elbow or branch tee with shaft in horizontal position.
  - b. Where it cannot be avoided, a vertical elbow or branch tee immediately upstream of valve, install valve with shaft in vertical position.
  - c. Where it cannot be avoided, a horizontal elbow or branch tee immediately upstream of valve, install valve with shaft in horizontal position.
  - d. Where it cannot be avoided, when installed immediately downstream of swing check, install valve with shaft perpendicular to swing check shaft.
  - e. For free inlet or discharge into basins and tanks, install valve with shaft in vertical position.
- 4. Check Valves:
  - a. Install valve in accordance with manufacturer's instructions and provide required distance from immediate upstream fitting.
  - b. Install valve in vertical flow (up) piping only for gas services.
  - c. Install swing check valve with shaft in horizontal position.
  - d. Install double disc swing check valve to be perpendicular to flow pattern when discs are open.
- E. Locate valve to provide accessibility for control and maintenance.

### 3.02 TESTS AND INSPECTION

- A. Valve may be either tested while testing pipelines, or as a separate step.
- B. Test that valves open and close smoothly under operating pressure conditions. Test that two-way valves open and close smoothly under operating pressure conditions from both directions.
- C. Automatic valves to be tested in conjunction with control system testing. Set opening and closing speeds, limit switches, as required or recommended by Engineer.

### 3.03 SUPPLEMENTS

- A. The supplements listed below, following "End of Section," are part of this Specification.
  - 1. Pneumatic Actuated Valve Schedule.

## END OF SECTION

Pneumatic Actuated Valve Schedule								
Tag Number	Valve Type	Size (inches)	Fluid	Maximum Operating Flow	Maximum ΔP (psi)	Service	Travel Time (Seconds)	Actuator Type and Control Features
POV_8110A	V335	3	NaOCI	N/A	N/A	O/C	15	FC, I, J
POV_8120A	V335	3	NaOCI	N/A	N/A	O/C	15	FC, I, J
POV_8130A	V335	3	NaOCI	N/A	N/A	O/C	15	FC, I, J

Service: O/C = Open-Close, T = Throttling, M = Modulating  
 Actuator Type and Control Features:  
 A = Vane Type Actuator.  
 B = Cylinder Type Actuator.  
 C = Diaphragm Type Actuator.  
 D = Valve shall open upon loss of signal.  
 E = Valve shall remain in last position upon loss of signal.  
 FC = Fail Close on loss of air supply (Air to open, spring to close).  
 FO = Fail Open on loss of air supply (Air to close, spring to open).  
 G = Positioner with 3 to 15 psig pneumatic input signal.  
 H = Valve position output converter that generates isolated 4 mA to 20 mA dc signal in proportion to valve position, and is capable of driving into loads of up to 500 ohms at 24 volts dc.  
 I = Visual indicator.  
 J = Manual handwheel override.  
 L = Limit switch.

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**SECTION 43 32 67**  
**DEGASIFIER PACKING REPLACEMENT**

**PART 1 GENERAL**

1.01 GENERAL

- A. This section covers the replacement of the mist eliminator bed packing and the main bed packing in two existing degasifiers located at the Fort Lauderdale, Florida, Peele-Dixie Water Treatment Plant. Tasks include removal and disposal of the existing packing, cleaning and inspecting the inside of the two degasifiers, and providing and installation of the replacement packing.
- B. Coordinate work in this section with work specified in Section 43 32 70, Degasifier Chemical Clean-In-Place System.

1.02 DESCRIPTION OF EXISTING DEGASIFIER SYSTEM

- A. The existing Peele-Dixie Water Treatment Plant provides potable water to the City of Fort Lauderdale, Florida. The water treatment plant (WTP) is located at 1500 SR 7 in Fort Lauderdale, Florida. The treatment plant treats well water from an 8-well wellfield located at the Fort Lauderdale Country Club. The water is treated via the nanofiltration process which consists of four membrane skids each capable of producing 3 million gallons of water per day (mgd) for a total design flow rate of 12 mgd. Permeate from the membrane trains is sent to two parallel degasifiers (also called “strippers” or “air strippers” in the reference drawings included in these Contract Documents) for removal of excess carbon dioxide, hydrogen sulfide, and any volatile organic compounds that may be present. The treated water is then conveyed to two ground storage tanks and ultimate distribution to the city.
- B. The existing degasifiers (AIRS2610 and AIRS2620) are each 12 feet - 6 inches in diameter by 37 feet-2-inch overall height. The degasifiers are constructed of fiberglass reinforced plastic (FRP) and are positioned above an in-ground concrete clear well. Space has been left for the addition of a future equally-sized third degasifier. Treated water is pumped from the wet well by Transfer Pumps 1, 2, and 3 to the ground storage tanks.
- C. Permeate is fed to the top of the two degasifiers through a 16-inch line to a combination of an influent header, a removable “parting box,” and removable weir troughs. The distribution header is 16-inch diameter SDR 26 PVC. The parting box and weir troughs are constructed of 3/8-inch thick PVC. The permeate cascades down through the main bed packing, which consists of 2,699 cubic feet of 3-1/2-inch Jaeger Tri-Pack media. The packing is supported on a 2-inch by 2-inch polypropylene grating. Air flowing upward through the media strips dissolved gases from the permeate. The stripping air is provided by fans FAN\_2601 and FAN\_2602. The air is discharged to the atmosphere through a mist eliminator which consists of 128 cubic feet of 2-inch Jaeger Tri-Pack media.

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- D. Over time, the weir troughs, mist eliminator packing, and main bed packing can accumulate sludge, solids, and scale, and can require chemical cleaning. Depending on the particular type of fouling experienced, the required cleaning chemical could be sulfamic acid, muriatic acid, sulfuric acid, or sodium hypochlorite. The degasifiers and packing have not been properly cleaned since their original installation in 2007.

1.03 SUBMITTALS

- A. Contractor shall provide the following information to Engineer for review prior to starting the work specified in this Section:
1. Project schedule.
  2. Cleaning and replacement procedure details.
  3. Cut-sheets and catalog data for the proposed packing.

**PART 2 PRODUCTS**

2.01 GENERAL

- A. Packing shall be provided to promote the transfer of hydrogen sulfide, carbon dioxide, and any volatiles that may be present from the downward cascading liquid stream to the countercurrent air stream.
- B. Packing media shall consist of spherical injection molded thermoplastic balls with a symmetrical network of ribs, struts, and drip rods.
- C. Media: Jaeger Tri-Packs Product Bulletin 600. No exceptions.
- D. All items that come in contact with water or chemicals shall be NSF or Food Grade.

2.02 MAIN BED MEDIA

- A. Material: Polypropylene.
- B. Nominal Diameter: 3.5 inches.
- C. Geometric Surface Area: 38 sq.ft./cu.ft.
- D. Packing Factor: 12 units/foot.
- E. Void Space: 95 percent.
- F. Bulk Density: 3.3 lb/cu.ft.
- G. Volume Required: 2,699 cubic feet.

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2.03 MIST ELIMINATOR BED MEDIA

- A. Material: Polypropylene.
- B. Nominal Diameter: 2.0 inches.
- C. Geometric Surface Area: 48 sq.ft./cu.ft.
- D. Packing Factor: 16 units/foot.
- E. Void Space: 93.5 percent.
- F. Bulk Density: 4.2 lb/cu.ft.
- G. Volume Required: 128 cubic feet.

**PART 3 EXECUTION**

3.01 GENERAL

- A. Coordinate the work specified in this Section with the work specified in Section 43 32 70, Degasifier Chemical Clean-In-Place System.
- B. Contractor shall perform work in such a manner that existing plant operations are not affected. Access by plant staff shall be continuously maintained.
- C. Only one degasifier can be out of service at any one time. Provide Owner with a minimum of one week's notice of start of work.
- D. Contractor shall retain the services of the original manufacturer of the existing degasifiers (HEE-Duall, Lenon, MI) to inspect each degasifier's internals, to recommend an appropriate cleaning chemical, and to recommend an appropriate cleaning procedure.
- E. Contractor shall retain the services of the original manufacturer of the existing degasifiers as specified above to visit the plant site at completion of vessel cleaning to inspect vessels and confirm the adequacy of the cleaning performed. Coordinate the final inspection of the first degasifier with the initial inspection of the second degasifier to minimize site visits. Engineer shall witness all inspections.

3.02 CLEANING AND MEDIA REPLACEMENT

- A. Contractor shall remove and dispose of all existing media at an approved off-site facility.
- B. Contractor shall clean vessel internals and vessel inside walls using manufacturer's recommended procedure.

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- C. Contractor shall neutralize and dispose of spent cleaning solution at an approved offsite location.
- D. Contractor and original equipment manufacturer shall inspect cleaned vessels and advise Owner of repairs that may be indicated during inspection. After review, Owner may then request that Contractor perform necessary repairs as additional work not included in the bid.
- E. Contractor shall place new mist eliminator packing and new main bed packing in strict conformance with packing manufacturer's written instructions.
- F. Contractor shall disinfect degasifiers in accordance with Section 33 13 00, Disinfection of Water Utility Distribution Facilities.
- G. Manufacturers' Certificate(s): Provide manufacturer's certificate(s) in accordance with Division 1, General Requirements.

**END OF SECTION**

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**SECTION 43 32 70**  
**DEGASIFIER CHEMICAL CLEAN-IN-PLACE SYSTEM**

**PART 1 GENERAL**

1.01 GENERAL

- A. This section covers the installation of facilities required to provide a complete and operating permanent degasifier chemical clean-in-place system for Fort Lauderdale's Peele-Dixie Water Treatment Plant.
- B. The Degasifier Chemical Clean-In-Place System shall consist, at a minimum, of a skid-mounted chemical cleaning solution recirculation pump; all required piping, valves, instrumentation and controls, and electrical wiring and all necessary appurtenances; as well as any piping, valving, civil, structural, electrical, controls, or instrumentation modifications to the existing degasifier system required for proper operation.
- C. Design of Clean-in-Place System presented in these Contract Documents is based on a design provided by the original manufacturer of the existing degasifiers (HEE-Duall, Lenon, MI). If an alternate design is proposed by Contractor, Contractor shall assume all costs incurred by any required redesign.
- D. Coordinate work in this Section with work specified in Section 43 32 67, Degasifier Packing Replacement.

1.02 DESCRIPTION OF EXISTING DEGASIFIER SYSTEM

- A. The existing Peele-Dixie Water Treatment Plant provides potable water to the City of Fort Lauderdale, Florida. The treatment plant is located at 1500 SR 7 in Fort Lauderdale, Florida. The treatment plant treats well water from an 8-well wellfield located at the Fort Lauderdale Country Club. The water is treated via the nanofiltration process. The nanofiltration installation consists of four membrane skids each capable of producing 3 million gallons of water per day (mgd), for a total design flow rate of 12 mgd. Permeate from the membrane trains is sent to two parallel degasifiers for removal of excess carbon dioxide, hydrogen sulfide, and any volatile organic compounds that may be present. The treated water is then conveyed to two ground storage tanks for ultimate distribution to the city.
- B. The existing degasifiers (AIRS2610 and AIRS2620) are each 12 feet-6 inches in diameter by 37 feet-2 inches overall height. The degasifiers are constructed of fiberglass reinforced plastic (FRP) and are positioned above an in-ground concrete clearwell. Space has been left for the addition of a future equally-sized third degasifier. Permeate is pumped from the clearwell to the ground storage tanks by Transfer Pumps 1, 2, and 3.

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- C. Permeate is fed to the top of the two degasifiers through a 16-inch line. The permeate is distributed across the vessel packing bed which consists of 2,699 cubic feet of 3-1/2-inch Jaeger Tri-Pack media. Air flowing upward through the media strips dissolved carbon dioxide, hydrogen sulfide, and volatile organic compounds from the permeate. The stripping air is provided by fans FAN\_2601 (for AIRS2610) and FAN\_2602 (for AIRS2620), each with a nominal capacity of 18,000 cfm. The air is discharged to the atmosphere through a mist eliminator bed consisting of 128 cubic feet of 2-inch Jaeger Tri-Pack media.
- D. Over time, the degasifier weir troughs, mist eliminator packing, and tower packing can accumulate sludge, solids, and scale, and can require chemical cleaning to restore full operational capacity. Depending on the particular type of fouling experienced, the chemical used for cleaning could be sulfamic acid, muriatic acid, sulfuric acid, or sodium hypochlorite. The plant's original intent was to perform the cleaning using temporary contractor-provided facilities. This Project will provide a permanently installed chemical clean-in-place system for future cleaning operations.

### 1.03 SUBMITTALS

- A. Contractor shall provide the following information to Engineer for review prior to purchasing equipment or fabrication:
1. Cut sheets and catalog data for the proposed chemical clean-in-place solution recirculation pump, including pump curve and motor electrical requirements.
  2. Cut sheets, catalog data, and drawings for all electrical control panels and instrumentation and control components.
  3. Cut sheets, catalog data, and drawings for piping, pipe supports, and mounting details.
  4. Cut sheets and catalog data for all isolation valves and check valves.
  5. Degasifier vessel modification requirements and details.
  6. Installation drawings and bill of materials for the complete chemical clean-in-place system.

## PART 2 PRODUCTS

### 2.01 GENERAL

- A. Chemical cleaning solution recirculation pump, recirculation pump skid, cleaning solution distribution header, degasifier nozzles, piping, pipe supports, and all other system components shall be compatible with 10 percent sulfamic acid, 30 percent muriatic acid, 15 percent sodium hypochlorite, and 30 percent sulfuric acid.
- B. Chemical cleaning solution will be added to the chemical cleaning system by Owner.

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- C. All system components in contact with permeate or chemical cleaning solution shall comply with NSF Standard 61.
- D. All items that come in contact with water or chemicals shall be NSF or Food Grade.

## 2.02 RECIRCULATION PUMP

- A. Capacity: 500 gpm at 60 feet TDH.
- B. Fybroc Model 2530 or approved equal, FRP case, impeller, and cover, 3x4x6, 3600 rpm, 20 HP 480 volt, 3 phase motor.
- C. Recirculation pump shall be non-overloading over the entire operating curve.
- D. Skid mounted; skid shall be constructed of FRP. Skid shall be located on reinforced concrete equipment pad provided by Contractor. Stainless steel anchor bolts shall be used to anchor the skid to the concrete pad.

## 2.03 PIPING

- A. Piping provided by this section shall be as shown on the Drawings and shall consist of:
  - 1. All piping on the pump skid.
  - 2. All piping between the degasifiers and the recirculation pump.
  - 3. All piping between the recirculation pump and the degasifiers.
  - 4. The new distribution header in each degasifier.
  - 5. Any other piping required to provide a complete and operable system.
- B. Piping shall be as specified in section 40 27 00, Process Piping-General.
- C. Isolation valves shall be provided to allow the Owner to manually select which degasifier to clean. Only one degasifier will be cleaned at a time. Isolation valves and check valves shall be as specified in Section 40 27 02, Process Valves and Operators.
- D. Pipe supports for recirculation pump discharge piping routed vertically along and supported from the degasifier vessels shall be designed, fabricated, and installed by Clean-in-Place System Subcontractor who shall be experienced in retrofitting existing FRP vessels.

## 2.04 CONTROL PANEL

- A. NEMA 4; Type 316 stainless steel.
- B. Pump Start-Stop switch.
- C. System ON indicator light.

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- D. Emergency stop push button.
- E. Control power transformer.
- F. Motor starter.

## 2.05 MODIFICATIONS TO EXISTING DEGASIFIER SYSTEM

- A. Contractor shall coordinate with original degasifier manufacturer listed above to ensure that new and existing components are compatible.
- B. Chemical clean-in-place system piping from the chemical cleaning solution recirculation pump discharge to the existing degasifiers shall connect to a new 6-inch distribution header in each degasifier, as well as to a new 4-inch mist eliminator spray nozzle in the top of each degasifier, both provided as a part of this Project. Pump suction piping shall connect to a new 6-inch nozzle installed in each degasifier as part of this Project.
- C. Mist eliminator spray nozzle shall be manufactured by Spraying Systems Company and shall be sized to provide uniform distribution of 75 gpm to 200 gpm of cleaning solution across mist eliminator bed. Spray nozzle shall be constructed of material recommended by nozzle manufacturer for intended service.
- D. All new nozzles installed on existing degasifier vessels shall be designed, fabricated, and installed by Clean-in-Place System Subcontractor who shall be experienced in adding new nozzles to existing FRP tanks. Subcontractor shall add a new 6-inch flanged pump suction nozzle at the bottom of each degasifier, a new 6-inch flanged recirculation nozzle in the side of each degasifier, and a new 4-inch flanged nozzle in the top of each degasifier, all as shown on the Drawings. Method and materials shall be compatible with cleaning chemicals listed above.

**PART 3 EXECUTION**

## 3.01 GENERAL

- A. Contractor shall perform work in such a manner that existing plant operations are not affected. Access by plant staff shall be maintained throughout construction.
- B. All piping, valves, electrical conduit, and other system components shall be adequately supported to Engineer's satisfaction.
- C. All piping, valves, and metallic system components shall be coated with one 2.5 MDFT coat of epoxy primer, one 4 MDFT intermediate coat of high build epoxy, and one 3 MDFT coat of polyurethane enamel. Coatings shall be products of Tnemec, PPG, or Sherwin Williams. Surfaces shall be cleaned and coatings shall be applied in strict conformance with coating manufacturer's instructions. Contractor shall consult with Engineer for clarification on items to be coated and

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items not to be coated. Final coat color shall be as specified by Engineer. Protective coatings shall be applied by brush or roller. No spray painting is allowed.

- D. At completion of construction, all system components shall be flushed with potable water and disinfected in conformance with ANSI/AWWA C651 and Section 33 13 00, Disinfection of Water Utility Distribution Facilities.
- E. At completion of construction, piping shall be hydrostatically tested at 50 psi for three hours.
- F. At completion of construction, Contractor shall remove all construction debris and completely clean construction area to Engineer's satisfaction.

3.02 MANUFACTURER SERVICES

- A. Contractor shall retain the services of the original degasifier manufacturer listed above to visit the plant site at completion of construction and before commissioning to inspect installation and confirm that installation meets all required criteria.
- B. Manufacturer's representative shall conduct acceptance test on installation.
- C. Site visit shall be one day in duration, excluding travel.

3.03 ACCEPTANCE TESTING

- A. Chemical clean-in-place system shall be tested for a minimum of two hours to demonstrate satisfactory operation of recirculation pump and controls. Potable water shall be used for the test rather than chemical cleaning solution. The acceptance test shall be conducted on one degasifier at a time. The acceptance test shall be witnessed by Engineer.
- B. Problems encountered during testing shall be immediately addressed by Contractor to Engineer's satisfaction and test shall be restarted.

**END OF SECTION**

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**SECTION 43 40 02**  
**FIBERGLASS REINFORCED PLASTIC TANKS****PART 1 GENERAL**

## 1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Society of Mechanical Engineers (ASME):
    - a. B16.5, Pipe Flanges and Flanged Fittings NPS 1/2 through NPS 24.
    - b. RTP-1, Reinforced Thermoset Plastic Corrosion Resistant Equipment.
  2. ASTM International (ASTM):
    - a. C582, Specification for Contact-Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion-Resistance Equipment.
    - b. D2583, Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.
    - c. D2584, Test Method for Ignition Loss of Cured Reinforced Resins.
    - d. D3299, Specification for Filament-Wound Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks.
    - e. D4097, Specification for Contact-Molded Glass-Fiber-Reinforced Thermoset Resin Chemical-Resistant Tanks.
    - f. E84, Test Method for Surface Burning Characteristics of Building Materials.
    - g. E1067, Practice for Acoustic Emission Examination of Fiberglass Reinforced Plastic Resin (FRP) Tanks/Vessels.

## 1.02 DEFINITIONS

- A. FRP: Fiberglass reinforced plastic.

## 1.03 DESIGN REQUIREMENTS

- A. Design Loads: In accordance with Florida Building Code, 6<sup>th</sup> Edition (2017).
- B. Tanks specified to be fabricated to ASME RTP-1 requirements shall be designed, fabricated, and code stamped. ASME RTP-1 shall be all inclusive standard for the tanks of this section.
- C. The User's Basic Requirements Specification (UBRS) for RTP-1 tanks is a part of this Specification.
- D. Design tank, including resin selection (unless specified), wall thickness, methods and locations of support, and stiffener requirements. Design and associated calculations shall be prepared, signed, and sealed by a Professional Structural Engineer meeting requirements of paragraph Quality Assurance of this section.
- E. Special Loads: Design tanks for dead load, live load, and wind load from attached piping, ladders, and guardrail. Design top of Sodium Hypochlorite Bulk Storage Tanks for 60 psf Live Load.

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- F. Hydrostatic Load: For specific gravities of stored materials specified herein. Tanks shall be designed to withstand the hydrostatic pressure resulting from an overflowing tank.
- G. Design tank, including resin selection, wall thickness, methods and locations of support, and stiffener requirements, and when specified, insulation. Design shall be prepared and sealed by designer meeting requirements of Article Quality Assurance.
- H. The fabricator shall be responsible for the basic design of the FRP tanks, including resin selection, wall thickness, methods and locations of support, and stiffener requirements. This is subject to review and approval by the Engineer.
- I. All flanged nozzles on the tanks shall be rated at 100 psi according to PS15-69. The flange outer diameters and drilling shall be per ANSI 16.5.
- J. The fabricator shall be responsible for providing all information details and requirements for installation and support of the tank in whatever configuration is required.
- K. Nozzles shall have a 6-inch projection as measured from the face of the flange to the closest point on the outside of the tank.
- L. Tank heads shall have a factory-applied silica sand bead non-skid coating.
- M. Provide flanged nozzles for the tanks as shown on the attached Tank Data Sheets. For chemical fill lines, extend a fill pipe from the dome connection nozzle into the tank and terminate same 6 inches from the tank bottom. Provide internal sway brace style pipe supports for this fill pipe. The size of fill lines are indicated on the Tank Data Sheets or Contract Drawings. Fill lines are to be fabricated of the same materials as the tanks with the same corrosion barrier on all surfaces. Provide a 1-inch vent hole drilled into the fill pipe at a distance 1-foot above the maximum liquid level.
- N. The manways shall be manufacturer's standard vapor-tight flanged manways provided at the top.
- O. An NFPA safety yellow OSHA approved acrylic sign shall be visibly mounted on each chemical storage tank.
- P. The tanks, all components, and accessories shall be NSF-61 compliant.

## 1.04 SUBMITTALS

- A. Action Submittals:
  - 1. Shop Drawings:
    - a. Fabricators catalog information, descriptive literature, specifications, and identification of materials of construction, including complete resin system information.
    - b. Letter from resin manufacturer stating that selected resin is suitable for intended service.

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- c. Detailed fabrication drawings for tank and all related accessories (e.g., anchor lugs, etc.).
  - d. Complete catalog information for gasketing materials proposed for nozzle and manway flanges
  - e. Tank data indicating equipment number, pressure rating, diameter, straight shell lengths, overall lengths, wall thickness, corrosion barrier thickness, and details of nozzle designs.
  - f. Tank capacity chart indicating capacity (in gallons) for each 1-inch of depth and cumulative total capacity from bottom of tank.
  - g. Fabricator's detailed requirements for tank foundations.
  - h. Recommended bolt torque for bolted FRP connections.
2. Samples: Laminate sample representative of production quality of surface finish and visual imperfections.

B. Informational Submittals:

1. Complete signed and sealed design calculations for the FRP tanks, anchoring system, pipe supports, and accessories.
2. Certification to ASME RTP-1.
3. Fabricator's Certificate of Compliance with fabrication requirements.
4. Qualifications of Fabricator's Quality Assurance Supervisor.
5. Copy of fabricator's Quality Assurance Program.
6. Quality Assurance Inspection:
  - a. Qualifications of Independent FRP Quality Assurance Inspector.
  - b. Initial QA Inspection Report.
  - c. Certification of Factory Testing.
7. Information related to three reference projects as specified in paragraph 1.05, Quality Assurance. Special shipping, storage and protection, and handling instructions.
8. Fabricator's printed installation and tank support instructions.
9. Manufacturer's Certificate of Proper Installation in accordance with Division 01, General Requirements.

C. Contract Closeout Submittals: Service records for repairs performed during construction.

1.05 QUALITY ASSURANCE

- A. Fabricator's Quality Assurance Supervisor: Minimum of 10 years' experience in fabrication of fiberglass structures.
- B. Designer: Registered Professional Engineer (structural discipline) licensed in the State of Florida.
- C. Independent FRP Quality Assurance Inspector:
  1. Minimum 5 years' experience as FRP inspector.
  2. Representing a corporately and financially independent organization that can function as an unbiased inspection authority.

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3. Professionally independent of manufacturers, suppliers, and installers of systems being inspected.
- D. Provide a minimum of three reference projects including project names, owner, address, contact person, and telephone number for vertical tanks of comparable size, capacity and fluid service as the tanks of this section. Referenced tanks shall have been designed and manufactured by fabricator, and have been in service for more than 5 years. Projects cited as reference shall have been designed and fabricated based on ASME RTP-1 Code.
- 1.06 DELIVERY, STORAGE, AND HANDLING
- A. In accordance with Division 01, General Requirements. In addition, prepare and protect tank for shipment as follows:
1. Mount tank on padded cradles.
  2. Protect flanged nozzles with wooden blinds bolted to flange and having a diameter of 2 inches greater than outside diameter of flange.
  3. Provide either rigid plugs inside ends to prevent deflection or wooden boxes for unflanged components. Brace open end of tank with suitable stiffening member to prevent deflection.
  4. Do not ship components or other pieces loose inside tank.
  5. Load tank with at least 2 inches of clearance between tank (including fittings) and bulkheads, or bed of vehicle.
  6. Regardless of mode of transportation, firmly fasten and pad components to prevent shifting of load or flexing of components while in transit.

1.07 SEQUENCING AND SCHEDULING

- A. Do not ship tank from factory until Engineer's review of Certification of Factory Testing is completed.

**PART 2 PRODUCTS**

2.01 MANUFACTURERS

- A. Where a manufacturer's standard equipment name and/or model number is listed, the equipment system shall be provided as modified to conform to the performance, functions, features, and materials of construction as specified herein.
- B. Manufacturers of FRP tanks and accessories specified herein shall be as follows:
1. Augusta Fiberglass, Inc.
  2. Belco Manufacturing Co. Inc.
  3. Justin Tanks, LLC.
  4. Or equal.

2.02 SUPPLEMENTS

- A. Specific requirements relative to the tanks of this section is contained in a tank data sheet (TDS) provided as a Supplement at the end of this section.

FIBERGLASS REINFORCED PLASTIC TANKS

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## 2.03 SERVICE SITE CONDITIONS

- A. The new bulk storage tanks are to replace comparably sized existing FRP tanks in the Chemical Building that are leaking. See Division 01, General Requirements and Supplements for Drawings of the existing building.
- B. Operating Pressure: Atmospheric.
- C. Tanks shall be installed as indicated on the TDS at the end of this section.

## 2.04 MATERIALS

- A. Filament-Wound: Fabricate in accordance with ASME RTP-1.
- B. All materials in contact with fluid stored shall be NSF 61 approved.
- C. Resin:
  - 1. Suitable for intended service in contact with 15 percent (v/v) sodium hypochlorite solution.
  - 2. Premium grade and corrosion resistant vinyl ester resin.
  - 3. Use same resin throughout entire tank shell.
  - 4. Add ultraviolet absorbers to surfacing resin to improve weather resistance.
  - 5. No dyes, pigments, or colorants, except in exterior gel coat.
  - 6. No fillers or thixotropic agents.
  - 7. Curing System:
    - a. As recommended by resin manufacturer's written instructions or as specified herein.
    - b. Cure products as specified in ASME RTP-1.
    - c. Measure Barcol hardness according to ASTM D2583.
  - 8. Post-cure tank and appurtenances in accordance with resin manufacturer's recommendation for time and temperature. Post-curing should be completed with warm-to-hot dry air, free of combustion products. Hot spots shall be avoided.
  - 9. For sodium hypochlorite service, no MEKP cobalt catalyst system shall be allowed in liner. Cure liner with benzoyl peroxide-dimethyl aniline (BPO/DMA) cure system. Structural layer may be cured with either catalyst system.
- D. Reinforcements:
  - 1. Veil: Chemical surfacing mat, 12- to 16-mils thick per layer, with a finish and a binder compatible with the lay-up resin. Provide double layers of Nexus as chemical resistant veil.
  - 2. Interior Layer: A resin-rich interior surface of nominal 100 to 120 mils using chopped strand mat backing the veil. Use no additive in the corrosion barrier.
  - 3. Chopped Strand Mat: Type E glass, minimum 1-1/2 ounces per square foot, with silane finish and styrene soluble binder.
  - 4. Continuous Roving Used in Chopper Gun for Spray-Up: Type E glass.

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5. Woven Roving: Type E glass, nominal 24 ounces per square yard, 4 by 5 weave, with silane type finish.
6. Continuous Roving Used for Filament Winding: Type E glass with a silane type finish, with a nominal yield of at least 110 strand yards per pound.

## E. Laminate Requirements:

1. Consists of inner surface (corrosion barrier), interior layer, and exterior layer (structural layer).
2. Meet visual acceptance criteria in ASME RTP-1.
3. Meet requirements of mechanical properties in ASME RTP-1.
4. Reinforce inner surface with resin-rich surfacing veil of 10- to 20-mils thick.
5. The resin content of the inner surface shall be minimum of 80 percent by weight.
6. Glass content of combined inner surface and interior layer shall be 27 percent plus or minus 5 percent.
7. Exterior or structural layer shall be either helical filament wound for helical or contact molded fabricated as required to meet the tank design requirements. Filament winding fabrication continuous strand roving shall provide a glass content of 60 to 80 percent. The resin used in the tank structure is to be the same as that used in the corrosion barrier.
8. Resin used shall be a premium grade corrosion resistant vinyl ester. FRP tank manufacturer shall strictly follow the resin manufacturer's written recommendations for surface veil materials, resin cure system, and post cure requirements.
9. Corrosion barrier shall be a minimum 0.120 inches thick. Tanks wall shall not contain thixotropic agents, either in the tank body or in corrosion barrier overlays for secondary bonding of fittings, or interior top coats. Cure system for the corrosion barrier is to use an appropriate promotion/catalyzing system with a heat post cure applied to the finished vessel.
10. The inner surface exposed to the corrosive chemical environment shall be a smooth resin rich layer .020-inch thick, reinforced with two plies of a synthetic fiber surface mat such as Nexus. No glass fiber veil mat is to be used for Sodium Hypochlorite service.
11. The interior layer of the corrosion barrier shall be composed of non-continuous glass fiber strands (either chopped glass or chopped strand mat) equal to a minimum total of 3 oz/ft.<sup>2</sup>.
12. Fittings for tanks shall be the hand layup type employing the same corrosion barrier and cure system as used in the body of the vessel.
13. Interior secondary bonds and seals are to be overlaid with two plies of the surfacing veil employed for the body of the tank. This resin rich surface shall be applied to all surfaces which have been altered in the installation of any parts or fittings.
14. Post cure with dry heat shall be done by the tank manufacturer in accordance with the resin manufacturer's written recommendations. Any

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repairs or additional secondary bonds added to tank after post cure require an additional post cure cycle.

F. Marking:

1. Identify each tank with fabricator's name, capacity in gallons, maximum temperature, design pressure/vacuum, specific gravity, pH, resin, minimum thickness, tank number, tank name, and date of manufacture.
2. Provide permanent marking. Seal decals, labels, etc., into laminate exterior with clear resin.

G. Nozzles:

1. Gusset 4-inch or smaller nozzles with conical or plate type gussets. Larger nozzles shall be gusseted, if noted.
2. Finish flush with inside surface of tank, unless otherwise indicated.
3. Gaskets:
  - a. Provide two per nozzle, 1/8-inch thick, full-face elastomeric material having a hardness of Shore A60 plus or minus 5.
  - b. Gasket material shall be resilient and suitable for long term exposure to the chemical stored.
4. Flanged Nozzles: Rated at 100 psi, with other dimensions and bolting corresponding to ASME B16.5 for 150-pound steel flanges.
5. Back face of flanges shall be spot-faced, flat and parallel to flange face of sufficient diameter to accept SAE metal washer under bolthead or nut.
6. Nozzles shall have a minimum 6-inch projection as measured from the face of the flange to the tank shell or the dished head.
7. Side nozzles shall be mounted radially, perpendicular to the side shell. Top nozzles shall be mounted parallel to the vertical axis of the tank with bolt holes straddling a radial line.
8. Drain nozzles shall be full drain style and allow for complete drainage of the tank.
9. See attached TDS for nozzle orientation and locations.
10. In accordance with ASME RTP-1, no threaded fittings are permitted on the tank's top, bottom, or shell.

2.05 APPURTENANCES

- A. General: Anchor bolts and anchor lugs shall be sized by tank manufacturer to withstand all design internal and external loads. Anchor bolts and anchor lugs shall be Type 316 stainless steel. Anchor bolts shall be 1/2-inch minimum, epoxy adhesive style as manufactured by Hilti Inc., HIT Doweling Anchor System, HIT 500 SD, or equal.

B. Sight Glass (Type 2):

1. Calibrate in 100-gallon increments.
2. Abrasion and corrosion resistant.

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3. Mount using 1/2-inch chemically compatible tubing, CPVC fittings, PVC isolation ball valve, and stainless steel hose clamps.

C. Ultrasonic Level Transmitter:

1. General:
  - a. Function: Continuous, non-contacting level measurement.
  - b. Type: Ultrasonic.
  - c. Parts: Element, transmitter, interconnecting cable, and accessories as noted.
  - d. Provide:
    - 1) One for each bulk tank.
    - 2) One for day tank.
2. Service:
  - a. Operating Temperature Range:
    - 1) Element: Minus 4 degrees F to plus 149 degrees F.
    - 2) Transmitter: Minus 4 degrees F to 113 degrees F.
3. Performance:
  - a. Range:
    - 1) Bulk Tanks: 0 to 14 feet
    - 2) Day Tank: 0 to 10 feet
  - b. Zero Reference:
    - 1) Bulk Tanks: Tank bottom
    - 2) Day Tank: Sidewall bottom
  - c. Accuracy: Plus or minus 0.25 percent of maximum range or 6 mm, whichever is greater.
  - d. Resolution: 0.1 percent of range or 2 mm, whichever is greater.
  - e. Blanking Distance: 1 foot, maximum.
4. Element:
  - a. Housing: PVDF, unless otherwise noted.
    - 1) Other materials subject to Engineer approval.
  - b. Facing: None, unless otherwise noted.
  - c. Process Connection: See tank datasheet
  - d. Beam Angle: 12 degrees or less.
  - e. Integral temperature compensation.
5. Transmitter:
  - a. Display.
  - b. Integral keypad or nonintrusive external programming.
  - c. Enclosure: NEMA 4X polycarbonate, unless otherwise noted.
  - d. Power Supply: 115 volts, 50/60-Hz, unless otherwise noted.
  - e. Isolated Analog Output:
    - 1) One Minimum: 4 mA to 20 mA dc for load impedance of 0 to 750 ohms.
  - f. Discrete Outputs:
    - 1) Minimum, two relay (SPDT) rated for 2 amps continuous at 230V ac.
    - 2) Assignable and as noted.

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6. Interconnecting Cable: Weatherproof, UV protected, length as required, and type as recommended by manufacturer.
7. Manufacturers and Products: Pulsar; Blackbox Series 13X and Sensor.

D. Supports:

1. Pipe Supports:
  - a. Provide sway brace supports on interior and exterior of vessel for mounting of all tank piping and instrumentation.
  - b. Spacing of supports shall be recommended by the fabricator, but shall not be spaced further apart than 4-feet on center.
  - c. Shall allow removal of externally mounted pipes.
  - d. FRP complete with necessary bolts, nuts, and washers.
2. Internal and External Level Probe Supports: FRP.

E. Anchor Lugs: Provide suitably attached for all tank lugs, shall be Type 316 stainless steel.

F. Platforms, Handrails, and Kickplates:

1. Material: FRP.
2. Fasteners: Type 316 stainless steel.
3. FRP Supports: Locate as required for field installation of platforms, or handrails.
4. Handrails, and safety cages shall comply with all OSHA requirements.
5. Ladders from existing tanks to be reused on new tanks.
6. See attached Tank Data Sheets for details.

G. Lifting Lugs: Provide suitably attached for tanks.

H. Tank Access-Ways:

1. Tank access-way shall be manufacturer's standard 24-inch flanged access-way designed by the tank manufacturer. Gaskets shall be full-faced style manufactured of resilient material suitable for long-term exposure to the chemical stored. Gasket thickness shall be designed by manufacturer to provide a leaktight installation. Flange bolts, fasteners, and accessories on all access-ways shall be Type 316 stainless steel.
2. Equip each top mounted access-way flange with permanently installed lifting eyes/loops, two each.

2.06 SOURCE QUALITY CONTROL

A. Independent FRP Testing Inspector:

1. To be present at point of manufacture at time fabrication is started, to perform the following:
  - a. Observe manufacturing methods, machinery, and techniques to assure compliance with industry standards and these Specifications.

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- b. Observe initial fabrication to verify compliance with these Specifications.
  - c. Observe quality control methods for mixing resins and testing of completed equipment.
  - d. Generally observe quality of other ongoing fabrication.
  - e. Prepare Initial QA Inspection Report.
2. To be present at point of manufacture, upon completion of fabrication and prior to shipment, to perform or witness the following:
    - a. Visual inspection to requirements of ASTM D2563.
    - b. Barcol Hardness measurements per ASTM D2583.
    - c. Acetone sensitivity test for internal secondary bonds.
    - d. Glass content by ignition loss on three cutouts per ASTM D2584.
    - e. Hydrostatic Leak Test:
      - 1) Perform on each tank.
      - 2) Fill to top nozzle; allow to stand for 2 hours with no visible leakage.
  3. Prior to beginning repair work, repairs deemed acceptable by Independent FRP Testing Inspector shall be approved by Engineer.
- B. Identify and retain all cutouts. Engineer may select certain cutouts for testing for physical properties of laminate.
- C. Factory Test Reports: Certify results, by signature, of the following:
1. Inspections.
  2. Results of hydrostatic testing.
  3. Test reports of physical properties of standard laminates.

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION**

- A. In accordance with fabricator's written instructions.
- B. Accurately place anchor bolts using templates furnished by tank fabricator, and in accordance with the written instructions of the adhesive anchoring system manufacturer.

#### **3.02 LEVEL TRANSMITTER INSTALLATION**

- A. Provide Nametags: Component identification for field devices.
  1. Inscription: Component tag number.
  2. Materials: 16-gauge, Type 316 stainless steel.
  3. Letters: 3/16-inch-high, imposed.
  4. Mounting: Affix to component with 16-gauge or 18-gauge stainless steel wire or stainless steel screws.

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B. Adjust devices and software in existing plant as required for any scaling of new transmitters that differs from existing transmitters. Device and software to include, but not limited to:

1. Panel displays.
2. PLC software scaling.
3. PLC setpoints related to level input.

C. HMI scaling.

3.03 FIELD QUALITY CONTROL

A. Functional Test:

1. Conduct on each tank.
2. Hydrostatic leak test with tank full of clean water. Allow water to stand for 24 hours to verify no leakage.

3.04 MANUFACTURER'S FIELD SERVICES

A. Provide tank fabricator's representative at Site in accordance with Division 01, General Requirements:

1. 1 person-day and one trip to assist with the functional testing and completion of Manufacturer's Certification of Proper Installation.

3.05 SUPPLEMENTS

A. The supplement listed below, following "End of Section," is part of this specification.

1. Supplement 1, Sodium Hypochlorite Bulk Storage Tanks No. 1, 2 and 3.
2. Supplement 2, Sodium Hypochlorite Day Tank No. 1.

**END OF SECTION**

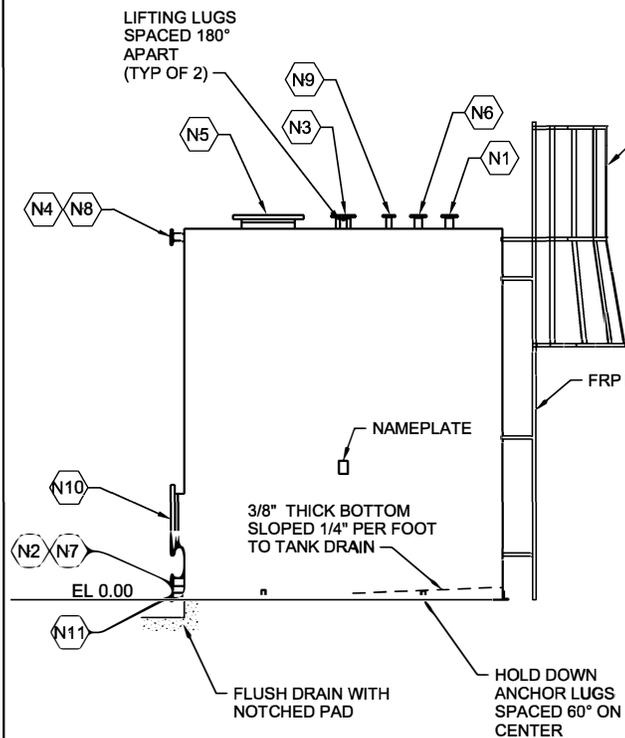


# TANK DATA SHEET

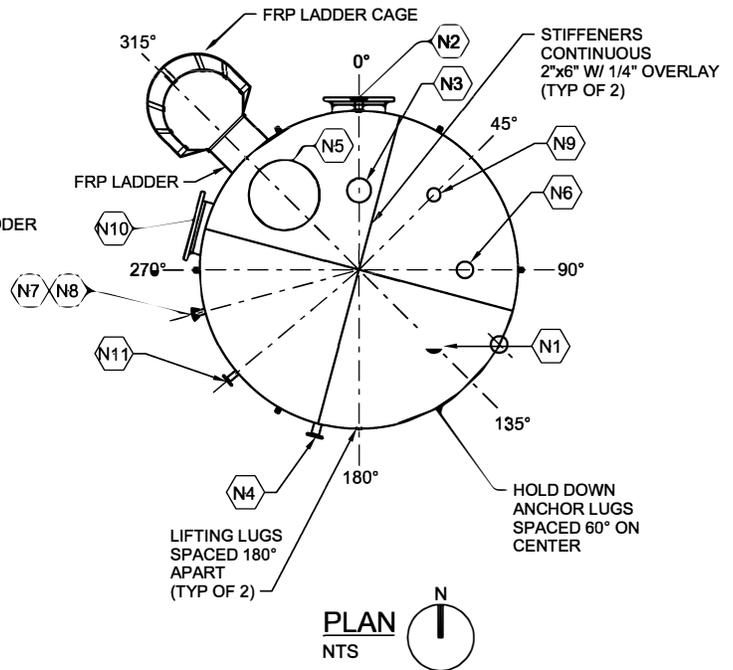
TANK NAME:	SODIUM HYPOCHLORITE BULK STORAGE TANK		
TAG NUMBER(S):	TK_ 8110, TK_ 8120, TK_ 8130		
QUANTITY:	3		
SERVICE:	SODIUM HYPOCHLORITE (6% TO 12.5% w/v)	SPECIFIC GRAVITY:	1.21 @ 68°F (Use 1.25 for structural design)
pH RANGE:	10 - 12	AMBIENT TEMP. RANGE (°F):	20°F - 105°F
DIAMETER:	12'-0"	STRAIGHT SHELL HEIGHT:	14'-0"
CAPACITY:	11,450 GALLONS (MIN.)	STRAIGHT SKIRT HEIGHT:	N/A

**NOTES:**

1. HORIZONTAL NOZZLE ELEVATIONS REFERENCED FROM DATUM TO CENTERLINE OF FITTING.
2. TANK MANUFACTURER TO PROVIDE INTERNAL AND EXTERNAL FRP SUPPORTS FOR FILL AND OVERFLOW PIPING.
3. TANK ANCHOR LUGS AND ANCHOR BOLTS DESIGNED BY MANUFACTURER. DESIGN TO MEET STRUCTURAL DESIGN REQUIREMENTS PER CONTRACT DOCUMENTS.
4. OSHA COMPLIANT LADDER AND CAGE BY TANK CONTRACTOR AND AS APPROVED BY ENGINEER.
5. SEISMIC AND WIND LOADS SPECIFIED IN CONTRACT DOCUMENTS.



**COMPOSITE SECTION**  
NTS



**PLAN**  
NTS

\* FLUSH BOTTOM STYLE NOZZLE REQUIRED

NOZZLES	MARK	QTY.	SIZE	ELEV. (SEE NOTE 1)	CL RADIUS	APPROX. BEARING ANGLE (∠A) (SEE NOTE 3)	DESIGN DATA
FILL	N1	1	3"	TOP	4'-0"	135°	TANK LOCATION: OUTDOORS
OUTLET	N2	1	3"	0'-8"		0°	TYPE OF TOP: FLAT
LEVEL INSTRUMENT	N3	1	6"	TOP	3'-0"	0°	TYPE OF BOTTOM: FLAT
OVERFLOW	N4	1	3"	13'-8"		195°	LADDER REQUIRED: YES
MANWAY ACCESS	N5	1	24"	TOP	4'-0"	315°	PIPE SUPPORTS FOR INTERIOR PIPING: YES
VENT	N6	1	3"	TOP	4'-0"	90°	PIPE SUPPORTS FOR EXTERIOR PIPING: YES
SITE INDICATOR	N7	1	2"	1'-0"		255°	GRADUATED STANDPIPE: NO
SITE INDICATOR	N8	1	2"	13'-8"		255°	INSULATION: NO
PROCESS	N9	1	2"	TOP	4'-0"	45°	HANDRAILS: YES
MANWAY ACCESS	N10	1	24"	3'-0"		285°	TIE DOWN SYSTEM: YES
FLUSH DRAIN	N11	1	2"	0'-2" *		230°	LATERAL RESTRAINT: YES

CAM # 19 0775

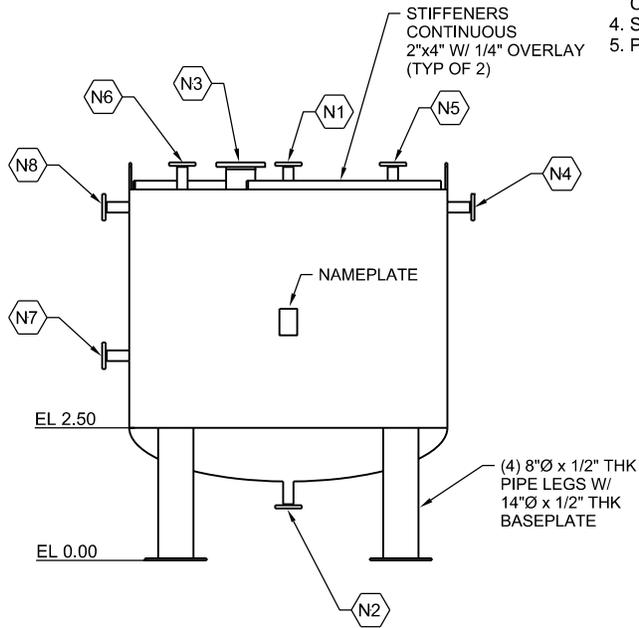


# TANK DATA SHEET

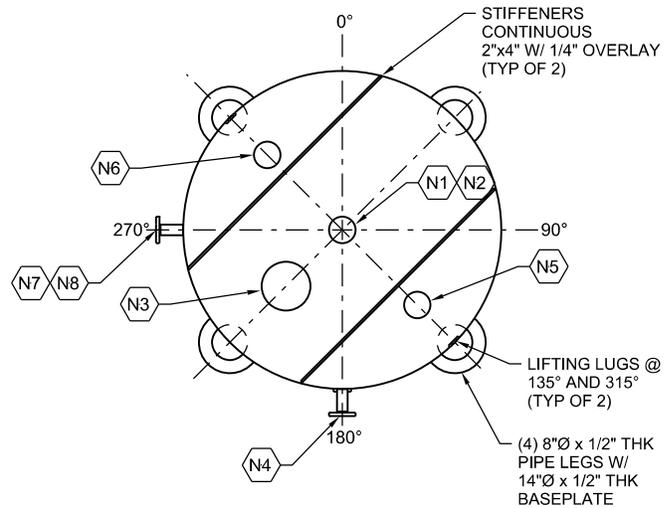
TANK NAME:	SODIUM HYPOCHLORITE DAY TANK		
TAG NUMBER(S):	TK_8140		
QUANTITY:	1		
SERVICE:	SODIUM HYPOCHLORITE (6% TO 12.5% w/v)	SPECIFIC GRAVITY:	1.21 @ 68°F (Use 1.25 for structural design)
pH RANGE:	10 - 12	AMBIENT TEMP. RANGE (°F):	20°F - 150°F
DIAMETER:	6'-0"	OVERALL HEIGHT:	7'-0"
CAPACITY:	1,600 GALLONS (MIN.)	STRAIGHT SIDE HEIGHT:	7'-9"

**NOTES:**

- HORIZONTAL NOZZLE ELEVATIONS REFERENCED FROM DATUM TO CENTERLINE OF FITTING.
- TANK MANUFACTURER TO PROVIDE INTERNAL AND EXTERNAL FRP SUPPORTS FOR FILL AND OVERFLOW PIPING.
- TANK ANCHOR LUGS AND ANCHOR BOLTS DESIGNED BY MANUFACTURER. DESIGN TO MEET STRUCTURAL DESIGN REQUIREMENTS PER CONTRACT DOCUMENTS.
- SEISMIC AND WIND LOADS SPECIFIED IN CONTRACT DOCUMENTS.
- PLACE NAMEPLATE ON TANK WALL BETWEEN N4 AND N7/N8.



**COMPOSITE SECTION**  
NTS



**PLAN**  
NTS

NOZZLES	MARK	QTY.	SIZE	ELEV. (SEE NOTE 1)	CL RADIUS	APPROX. BEARING ANGLE (∠A) (SEE NOTE 3)	DESIGN DATA
FILL	N1	1	2"	TOP	CTR		TANK LOCATION: OUTDOORS
OUTLET	N2	1	2"	BOTTOM	CTR		TYPE OF TOP: FLAT
LEVEL INSTRUMENT	N3	1	6"	TOP	1'-6"	225°	TYPE OF BOTTOM: DOMED
OVERFLOW	N4	1	2"	6'-8"		180°	LADDER REQUIRED: NO
VENT	N5	1	2"	TOP	2'-0"	135°	PIPE SUPPORTS FOR INTERIOR PIPING: YES
VENT	N6	1	2"	TOP	2'-0"	315°	PIPE SUPPORTS FOR EXTERIOR PIPING: YES
SITE INDICATOR	N7	1	2"	3'-10 3/8"		270°	GRADUATED STANDPIPE: NO
SITE INDICATOR	N8	1	2"	6'-8"		270°	INSULATION: NO
							HANDRAILS: NO
							TIE DOWN SYSTEM: YES
							LATERAL RESTRAINT: YES

CAM # 19-0775



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ITB NO. 12196-193  
PEELE-DIXIE WATER TREATMENT PLANT CHEMICAL TANK REPLACEMENTS  
AND DEGASIFIER IMPROVEMENTS  
PROJECT 12295

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**ADDENDUM NO. 1**

ISSUED: March 20, 2019

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This Addendum is being issued to provide the following information. It is hereby made a part of the Plans and Specifications and shall be included with all contract documents.

Acknowledge receipt of this Addendum by inserting its number and date on the CITB Construction Bid Certification Page.

**1-New Document Added:**

**Plan Specification Request Form:** Proposers' must fill out and return form to gain access to solicitation plans.

**2-New Dates:**

**a) Pre-Bid Meeting:**

Old Date: Monday March 25th at 11:00am.

**New Date: Monday April 8<sup>th</sup> at 11:00am**

**b) Questions and Answers – Bid Opening Will be extended:**

Old Dates: Q & A April 11<sup>th</sup> – Bid Opening April 22<sup>nd</sup>.

**New Dates: Q & A April 19<sup>th</sup> – Bid Opening May 2<sup>th</sup>.**

All other terms, conditions, and specifications remain unchanged.



City of Fort Lauderdale • Procurement Services Division  
100 N. Andrews Avenue, 619 • Fort Lauderdale, Florida 33301  
954-828-5933 Fax 954-828-5576  
[purchase@fortlauderdale.gov](mailto:purchase@fortlauderdale.gov)

*Fausto Vargas*  
Procurement Specialist

Company Name: \_\_\_\_\_  
(please print)

Bidder's Signature: \_\_\_\_\_

Date: \_\_\_\_\_



CITY OF FORT LAUDERDALE
PLAN AND SPECIFICATION REQUEST FORM
For Architects, Engineers and Contractors or Governmental Agencies

Building Plans Custodian Obligations

Building Plans Custodian

- 1. Building plans, blueprints, schematic drawings, and diagrams, including draft, preliminary, and final formats, which depict the internal layout and structural elements of a building, arena, stadium, water treatment facility or other owned or operated by the City of Fort Lauderdale (City) are exempt from the Public Records law pursuant to FL Statute, Chapter 119.071.
2. Anyone possessing such exempt records is a PLANS CUSTODIAN

Obtaining Building Plans

Those records defined in the Statute as exempt may be obtained from the City only by licensed Architects, Engineers or Contractors, as well as Governmental Agencies who are performing work on or related to a building or structure owned or operated by the City.

Reproduction and Redistribution

The entities or persons who receive exempt documents from the city shall maintain the exempt status of the information.

Plans Custodians

The Plans Custodian shall provide safeguards to protect the content of the records from unauthorized use or alteration and to maintain the exempt status of those records.

Penalty and Fine Related to Violating Public Records Law

Willfully and knowingly violating Public Records law is a first degree misdemeanor, punishable by penalties of up to one year in prison, a fine of up to \$1,000, or both.

Documents Requested

Building/Structure: \_\_\_\_\_

Location: \_\_\_\_\_ (City)

Solicitation Number: \_\_\_\_\_

View Only Copies will Be Made

Documents: (Please complete page 2)

\_\_\_\_\_
\_\_\_\_\_

Requester Information

Name: \_\_\_\_\_

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

Project Name: \_\_\_\_\_

Company Name: \_\_\_\_\_

Address: \_\_\_\_\_

License Held: \_\_\_\_\_

License Number: \_\_\_\_\_

Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

As the authorized licensed Architect, Engineer or Contractor or Government Agency representative, I acknowledge the acceptance of the City of Fort Lauderdale Records listed herein. As the plans custodian of these Records, I agree to the conditions and limitations outlined above. I understand that any unauthorized access or reproduction may be subject to criminal sanctions.

City of Fort Lauderdale
Public Works Engineering Division
100 N Andrews Avenue
Fort Lauderdale, Florida 33301
Fax: (954) 828-5074
Email: plan@fortlauderdale.gov

A copy of the Professional License\* must be provided by Architects, Engineers and Contractors before authorization is given to download secured solicitations. Send a copy of the license and this completed form via email or fax (see contact information above).

\*License is not required for Governmental Agencies.

- Unawarded firm(s) shall return all documents to the City within ten (10) business days after the solicitation has closed.



**Sub-Contractor/Sub-Consultant Receiving  
Reproduction & Redistribution of Exempt  
Information**

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Project Name: \_\_\_\_\_  
Company Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
License Held: \_\_\_\_\_  
License Number: \_\_\_\_\_  
Phone: \_\_\_\_\_  
E-mail: \_\_\_\_\_  
Date: \_\_\_\_\_

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Project Name: \_\_\_\_\_  
Company Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
License Held: \_\_\_\_\_  
License Number: \_\_\_\_\_  
Phone: \_\_\_\_\_  
E-mail: \_\_\_\_\_  
Date: \_\_\_\_\_

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Project Name: \_\_\_\_\_  
Company Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
License Held: \_\_\_\_\_  
License Number: \_\_\_\_\_  
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Date: \_\_\_\_\_

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Project Name: \_\_\_\_\_  
Company Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
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License Number: \_\_\_\_\_  
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E-mail: \_\_\_\_\_  
Date: \_\_\_\_\_

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Title: \_\_\_\_\_  
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E-mail: \_\_\_\_\_  
Date: \_\_\_\_\_

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Project Name: \_\_\_\_\_  
Company Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
License Held: \_\_\_\_\_  
License Number: \_\_\_\_\_  
Phone: \_\_\_\_\_  
E-mail: \_\_\_\_\_  
Date: \_\_\_\_\_



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ITB NO. 12196-193  
PEELE-DIXIE WATER TREATMENT PLANT CHEMICAL TANK REPLACEMENTS  
AND DEGASIFIER IMPROVEMENTS  
PROJECT 12295

**ADDENDUM NO. 2**

ISSUED: March 22, 2019

This Addendum is being issued to provide the following information. It is hereby made a part of the Plans and Specifications and shall be included with all contract documents.

Acknowledge receipt of this Addendum by inserting its number and date on the CITB Construction Bid Certification Page.

**1-New Date:**

**a) Pre-Bid Meeting:**

Old Date: Monday April 8<sup>th</sup> at 11:00am.

**New Date: Wednesday April 10<sup>th</sup> at 11:00am**

All other terms, conditions, and specifications remain unchanged.

*Fausto Vargas*  
Procurement Specialist

Company Name: \_\_\_\_\_  
(please print)

Bidder's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**NON-COLLUSION STATEMENT:**

By signing this offer, the vendor/contractor certifies that this offer is made independently and *free* from collusion. Vendor shall disclose below any City of Fort Lauderdale, FL officer or employee, or any relative of any such officer or employee who is an officer or director of, or has a material interest in, the vendor's business, who is in a position to influence this procurement.

Any City of Fort Lauderdale, FL officer or employee who has any input into the writing of specifications or requirements, solicitation of offers, decision to award, evaluation of offers, or any other activity pertinent to this procurement is presumed, for purposes hereof, to be in a position to influence this procurement.

For purposes hereof, a person has a material interest if they directly or indirectly own more than 5 percent of the total assets or capital stock of any business entity, or if they otherwise stand to personally gain if the contract is awarded to this vendor.

In accordance with City of Fort Lauderdale, FL Policy and Standards Manual, 6.10.8.3,

3.3. City employees may not contract with the City through any corporation or business entity in which they or their immediate family members hold a controlling financial interest (e.g. ownership of five (5) percent or more).

3.4. Immediate family members (spouse, parents and children) are also prohibited from contracting with the City subject to the same general rules.

**Failure of a vendor to disclose any relationship described herein shall be reason for debarment in accordance with the provisions of the City Procurement Code.**

**NAME**

**RELATIONSHIPS**

-

**In the event the vendor does not indicate any names, the City shall interpret this to mean that the vendor has indicated that no such relationships exist.**

## CONTRACT PAYMENT METHOD

The City of Fort Lauderdale has implemented a Procurement Card (P-Card) program which changes how payments are remitted to its vendors. The City is transitioning from traditional paper checks to credit card payments via MasterCard or Visa as part of this program.

This allows you as a vendor of the City of Fort Lauderdale, to receive your payment fast and safely. No more waiting for checks to be printed and mailed.

In accordance with Article 7, item 7.6 of the contract, payments on this contract will be made utilizing the City's P-Card. Accordingly, bidders must presently have the ability to accept these credit cards or take whatever steps necessary to implement acceptance of a card before the start of the contract term, or contract award by the City.

Please indicate with which credit card you prefer to be paid:

Master Card

Visa Card

Company Name:	
Signature:	
Print Name Title:	

**CONSTRUCTION BID CERTIFICATION**

**Please Note:** All fields below must be completed. If the field does not apply to you, please note N/A in that field. If you are a foreign corporation, you may be required to obtain a certificate of authority from the department of state, in accordance with Florida Statute §607.1501 (visit <http://www.dos.state.fl.us/>).

Company: (Legal Registration)

Address:

City:  State:  Zip:

Telephone No.  FAX No.  Email:

Does your firm qualify for MBE or WBE status: MBE  WBE

If a corporation, state the name of the President, Secretary and Resident Agent. If a partnership, state the names of all partners. If a trade name, state the names of the individuals who do business under the trade name.

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Name</b>	<b>Title</b>	<b>Name</b>	<b>Title</b>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Name</b>	<b>Title</b>	<b>Name</b>	<b>Title</b>

**ADDENDUM ACKNOWLEDGEMENT** - Bidder acknowledges that the following addenda have been received and are included in the bid:

| Addendum No.         | Date Received        |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> |

**VARIANCES:** If you take exception or have variances to any term, condition, specification, or requirement in this bid you must specify such variance in the space provided below or reference in the space provided below all variances contained on other pages within your bid. Additional pages may be attached if necessary. No variances will be deemed to be part of the bid submitted unless such is listed and contained in the space provided below. The City does not, by virtue of submitting a variance, necessarily accept any variances. If no statement is contained in the below space, it is hereby implied that your response is in full compliance with this competitive solicitation. If you do not have variances, simply mark N/A. If submitting your response electronically through BIDSYNC you must also click the "Take Exception" button.

The below signatory affirms that he has or will obtain all required permits and licenses from the appropriate agencies, and that his firm is authorized to do business in the State of Florida. The below signatory agrees to furnish all labor, tools, material, equipment and supplies, and to sustain all the expense incurred in doing the work set forth in strict accordance with the bid plans and contract documents at the unit prices indicated if awarded a contract. The below signatory has not divulged to, discussed, or compared this bid with other bidders, and has not colluded with any other bidder or parties to this bid whatsoever. Furthermore, the undersigned guarantees the truth and accuracy of all statements and answers contained in this bid. The below signatory also hereby agrees, by virtue of submitting or attempting to submit a bid, that in no event shall the City's liability for bidder's direct, indirect, incidental, consequential, special or exemplary damages, expenses, or lost profits arising out of this competitive solicitation process, including but not limited to public advertisement, bid conferences, site visits, evaluations, oral presentations, or award proceedings exceed the amount of Five Hundred Dollars (\$500.00). This limitation shall not apply to claims arising under any provision of indemnification or the City's protest ordinance contained in this competitive solicitation.

**Submitted by:**

Name (printed)

Signature

\_\_\_\_\_ |  
Date:

\_\_\_\_\_ |  
Title

CONSTRUCTION BID CERTIFICATION

Please Note: All fields below must be completed. If the field does not apply to you, please note N/A in that field. If you are a foreign corporation, you may be required to obtain a certificate of authority from the department of state, in accordance with Florida Statute §607.1501 (visit http://www.dos.state.fl.us/).

Company: (Legal Registration) [ ]

Address: [ ]

City: [ ] State: [ ] Zip: [ ]

Telephone No. [ ] FAX No. [ ] Email: [ ]

Does your firm qualify for MBE or WBE status: MBE [ ] WBE [ ]

If a corporation, state the name of the President, Secretary and Resident Agent. If a partnership, state the names of all partners. If a trade name, state the names of the individuals who do business under the trade name.

Table with 4 columns: Name, Title, Name, Title. Each column has two input fields.

ADDENDUM ACKNOWLEDGEMENT - Bidder acknowledges that the following addenda have been received and are included in the bid:

Table with 8 columns: Addendum No., Date Received, Addendum No., Date Received, Addendum No., Date Received, Addendum No., Date Received.

VARIANCES: If you take exception or have variances to any term, condition, specification, or requirement in this bid you must specify such variance in the space provided below or reference in the space provided below all variances contained on other pages within your bid. Additional pages may be attached if necessary. No variances will be deemed to be part of the bid submitted unless such is listed and contained in the space provided below. The City does not, by virtue of submitting a variance, necessarily accept any variances. If no statement is contained in the below space, it is hereby implied that your response is in full compliance with this competitive solicitation. If you do not have variances, simply mark N/A. If submitting your response electronically through BIDSYNC you must also click the "Take Exception" button.

Large empty text box for variances with a small 5/6 icon on the right.

The below signatory affirms that he has or will obtain all required permits and licenses from the appropriate agencies, and that his firm is authorized to do business in the State of Florida. The below signatory agrees to furnish all labor, tools, material, equipment and supplies, and to sustain all the expense incurred in doing the work set forth in strict accordance with the bid plans and contract documents at the unit prices indicated if awarded a contract. The below signatory has not divulged to, discussed, or compared this bid with other bidders, and has not colluded with any other bidder or parties to this bid whatsoever. Furthermore, the undersigned guarantees the truth and accuracy of all statements and answers contained in this bid. The below signatory also hereby agrees, by virtue of submitting or attempting to submit a bid, that in no event shall the City's liability for bidder's direct, indirect, incidental, consequential, special or exemplary damages, expenses, or lost profits arising out of this competitive solicitation process, including but not limited to public advertisement, bid conferences, site visits, evaluations, oral presentations, or award proceedings exceed the amount of Five Hundred Dollars (\$500.00). This limitation shall not apply to claims arising under any provision of indemnification or the City protest ordinance contained in this competitive solicitation.

Submitted by:

[ ]

Name (printed)

[ ]

Date:

[ ]

Signature

[ ]

Date:

**CONTRACTOR'S CERTIFICATE OF COMPLIANCE WITH  
NON-DISCRIMINATION PROVISIONS OF THE CONTRACT**

The completed and signed form should be returned with the Contractor's submittal. If not provided with submittal, the Contractor must submit within three business days of City's request. Contractor may be deemed non-responsive for failure to fully comply within stated timeframes.

Pursuant to City Ordinance Sec. 2-17(a)(i)(ii), bidders must certify compliance with the Non-Discrimination provision of the ordinance.

- (a) Contractors doing business with the City shall not discriminate against their employees based on the employee's race, color, religion, gender (including identity or expression), marital status, sexual orientation, national origin, age, disability or any other protected classification as defined by applicable law.

**Contracts.** Every Contract exceeding \$100,000, or otherwise exempt from this section shall contain language that obligates the Contractor to comply with the applicable provisions of this section.

The Contract shall include provisions for the following:

- (i) The Contractor certifies and represents that it will comply with this section during the entire term of the contract.
- (ii) The failure of the Contractor to comply with this section shall be deemed to be a material breach of the contract, entitling the City to pursue any remedy stated below or any remedy provided under applicable law.

Authorized Signature

Print Name and Title

Date

**REFERENCES**

A minimum of three (3) references shall be provided:

**1. Company Name:**

Address:

Contact:

Phone #:  Email:

Contract Value:  Year:

Description:

**2. Company Name:**

Address:

Contact:

Phone #:  Email:

Contract Value:  Year:

Description:

**3. Company Name:**

Address:

Contact:

Phone #:  Email:

Contract Value:  Year:

Description:

**4. Company Name:**

Address:

Contact:

Phone #:  Email:

Contract Value:  Year:

Description:

**5. Company Name:**

Address:

Contact:

Phone #:  Email:

Contract Value:  Year:

Description:





CITY OF FORT LAUDERDALE

**Pre-Bid Meeting**  
 City of Fort Lauderdale  
 Pele-Dixie Water Treatment Plant Chemical Tank Replacements and Degasifier Improvements. P12295  
 Bid No. 12174-193  
 (April 10th, 2019 - 11:00:00 am)

Sign in Sheet

Name	Affiliation	Telephone No.	E-Mail Address
Thad Buckley	<del>RF</del> RF ENZONIMONTA SERVICES.	954-605-6711	thad3939@gmail.com
GEOFF SCHMIDT	LAWRENCE LEE CONSTRUCTION	561-578-7715	GL@LAWRENCELEECONSTRUCTION.COM
Miguel Lequerica	Florida Design Drilling	954-234-0939	Miguel@FLDrilling.com
NATHAN DAVIS	POLY PROCESSING	318 381 2352	ndavis@polyprocessing.com
Mark Welsh	Carl Eric Johnson	954-635-7514	m.welsh@cej.com.net
BILL SIMONDS	JACOBS EXCOR.	360-907-4590	bill.simonds@jacobs.com
Cesar Alza	City of Fort Lauderdale	954-828-7865	Cesara@FortLauderdale.gov
DON NERING	City of Fort Lauderdale	954.828.7502	DNERING@FORTLAUDERDALE.GOV
Roberto Runak	City of Fort Lauderdale	954-828-7867	RRUNAK@FortLauderdale.gov
Steve Hilberg	City of Fort Lauderdale	954 828-5076	SHilberg@FortLauderdale.gov
PAVOL PLECENIK	ODYSSEY MFG.	954-632-4090	PPLECENIK@ODYSSEYMANUFACTURING.COM
Fouad Wars	COFC	6167	fwars@



**Pavol Plecenik**  
Technologies Manager

**ODYSSEY**  
MANUFACTURING CO.  
1484 MASSARO BLVD  
TAMPA, FL 33619

Office **800 • ODYSSEY**  
Cell **954 • 632 • 4090**  
pplecnik@odysseymanufacturing.com

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Sales Engineer

Tel: (954) 635-7514  
Fax: (678) 377-2021  
email: mwelsh@cejco.net

**Carl Eric Johnson, Inc.**

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Stuart, FL 34997  
www.cejco.net

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**MIGUEL LEQUERICA**  
Assistant Project Manager

954-234-0939  
Miguel@FLDrilling.com

7733 Hooper Road  
West Palm Beach, FL 33411  
FLDrilling.com

State of Florida Water Well Contractor #11148  
State of Florida Certified General Contractor CGC1522104

**RF Environmental Services, Inc.**  
Water & Wastewater Construction

**Thaddeus Buckley**  
Vice President

20072A NE 15th Ct Miami, FL 33179

954-605-6711  
thad3939@gmail.com

**CGC 1518671 • CMC 1250334 • CFC 1429319 • PCC 1256939**

**LAWRENCE I LEE**  
CONSTRUCTION SERVICES

P.O. Box 1446  
Port Salerno, FL 34992

(561) 578 7715  
GS@LawrenceLeeConstruction.com



**GEOFFREY SCHMIDT**  
President

CHEMICAL TANK SPECIALIST



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Birmingham, AL 35209  
Cell: (318) 381-2352  
Fax: (205) 593-4078

**Nathan Davis**  
Regional Sales Manager  
Southeast U.S.

ndavis@polyprocessing.com  
www.polyprocessing.com



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ITB NO. 12196-193  
PEELE-DIXIE WATER TREATMENT PLANT CHEMICAL TANK REPLACEMENTS  
AND DEGASIFIER IMPROVEMENTS  
PROJECT 12295

**ADDENDUM NO. 3**

ISSUED: July 24, 2019

This Addendum is being issued to provide the following information. It is hereby made a part of the Plans and Specifications and shall be included with all contract documents.

Acknowledge receipt of this Addendum by inserting its number and date on the CITB Construction Bid Certification Page.

**1-New Date:**

**a) Bid Due Date**

Old Date: May 2, 2:00 PM

**New Date: Tuesday, May 14<sup>th</sup> at 2:00 PM**

All other terms, conditions, and specifications remain unchanged.

*James Hemphill*  
*Asst. Procurement and Contracts Mang.*

Company Name: \_\_\_\_\_  
(please print)

Bidder's Signature: \_\_\_\_\_

Date: \_\_\_\_\_



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100 N. Andrews Avenue, 619 • Fort Lauderdale, Florida 33301  
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PROJECT 12295

**ADDENDUM NO. 4**

ISSUED: May 10, 2019

This Addendum is being issued to provide the following information. It is hereby made a part of the Plans and Specifications and shall be included with all contract documents.

Acknowledge receipt of this Addendum by inserting its number and date on the CITB Construction Bid Certification Page.

**1-New Date:**

**a) Bid Due Date**

Old Date: May 14, 2:00 PM

**New Date: Tuesday, May 28<sup>th</sup> at 2:00 PM**

All other terms, conditions, and specifications remain unchanged.

*Fausto Vargas*  
*Procurement Specialist*

Company Name: \_\_\_\_\_  
(please print)

Bidder's Signature: \_\_\_\_\_

Date: \_\_\_\_\_



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AND DEGASIFIER IMPROVEMENTS  
PROJECT 12295

**ADDENDUM NO. 5**

ISSUED: May 17, 2019

This Addendum is being issued to provide the following information. It is hereby made a part of the Plans and Specifications and shall be included with all contract documents.

Acknowledge receipt of this Addendum by inserting its number and date on the CITB Construction Bid Certification Page.

**1-New Date:**

**a) Bid Due Date**

Old Date: Tuesday May 28th, 2:00 PM

**New Date: Tuesday, June 4<sup>th</sup> at 2:00 PM**

All other terms, conditions, and specifications remain unchanged.

*Fausto Vargas*  
*Procurement Specialist*

Company Name: \_\_\_\_\_  
(please print)

Bidder's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## Question and Answers for Bid #12196-193 - Peele-Dixie W. T. P. Chemical Tank Replacements and Degasifier Imp P12295

### Overall Bid Questions

#### Question 1

Please provide the engineer's estimate associated with this project. (Submitted: Mar 18, 2019 11:15:33 AM EDT)

#### Answer

- The estimated budget for this project is \$1,400,000.00 (Answered: Apr 8, 2019 8:54:46 AM EDT)

#### Question 2

How do you get the plans, who do we drop the Plan Request Form to and where? (Submitted: Mar 29, 2019 12:07:27 PM EDT)

#### Answer

- Please submitted PLAN AND SPECIFICATION REQUEST FORM to the email on the form and we will email you all the drawings. (Answered: Mar 29, 2019 2:26:41 PM EDT)

#### Question 3

What size is the bi-fold door? There are no dimensions on the plans or in the specs. (Submitted: Apr 8, 2019 4:36:54 PM EDT)

#### Answer

- 1. The bifold door dimensions will depend on the exact final dimensions of the exist. block wall opening created by the contractor.
- 2. The exist. block wall opening is defined on dwg. R-02, Section A. The wall opening height at the top is bounded by an exist. conc. beam. The wall opening is bounded on the bottom by the exist. grade and new conc. apron per detail on dwg. D-01. The width of the wall opening and new conc. apron is bounded by the exist. conc. columns on each side of the opening.
- 3. Note 3 on dwg. E-02 states in part **CONTRACTOR TO VERIFY (bifold door) OPENING SIZE BEFORE ORDERING DOOR.** (Answered: Apr 9, 2019 4:34:07 PM EDT)

#### Question 4

Please confirm if a Builder's Risk Policy is to be provided by the Contractor, Owner, or not at all for this project. (Submitted: Apr 11, 2019 2:01:29 PM EDT)

#### Answer

- Builder Risk policy will have to be provide by the contractor. (Answered: Apr 11, 2019 3:14:32 PM EDT)

#### Question 5

Does the City have a Bond Form or are we to use a standard AIA form? (Submitted: Apr 11, 2019 2:18:12 PM EDT)

#### Answer

- standard AIA form is ok. (Answered: Apr 11, 2019 3:14:32 PM EDT)

#### Question 6

In reference to 43 40 02, 1.03 - Please confirm if the tanks are to be built in accordance to the RTP-1 specifications or they need to bare a RTP-1 stamp. (Submitted: Apr 11, 2019 3:03:09 PM EDT)

#### Answer

- The tanks must be RTP-1 certified. (Answered: Apr 19, 2019 2:58:02 PM EDT)

#### Question 7

High Density Crossed-Linked Polyethylene (HDXLPE) tanks with an anti-oxidation interior, sloped bottom, and an integrally molded flanged outlet meet and/or exceed the requirements to store 12.5% Sodium Hypochlorite listed in the specifications. The lead time on those tanks are on average 4-6 weeks after approval drawings are released. Will these tanks be considered an approved alternate? (Submitted: Apr 12, 2019 12:53:08 PM EDT)

#### Answer

- High Density Crossed-Linked Polyethylene (HDXLPE) tanks with an anti-oxidation interior will be considered as an approved alternate. However, final approval will be based on review and approval of the shop drawing submitted during the contract that details all aspects of this alternate demonstrating functional equality to the specified FRP tanks. (Answered: Apr 19, 2019 2:58:02 PM EDT)

--CORRECTION--

The previous answer is incorrect.

For any substitution please follow the proper steps mention in our general conditions GC-03 (Answered: May 17, 2019 11:10:59 AM EDT)

#### Question 8

The FRP tanks have lead time of up to 18 weeks. Considering the time it takes to get submittals and submit for review, it should be 24 weeks, or 168 days, from date of order to delivery on site. Can the contract time frame please be adjusted to 240 days to substantial completion? (Submitted: Apr 12, 2019 12:56:03 PM EDT)

#### Answer

- Contract time adjustment will be considered during execution of the contract if it is justifiably demonstrated by the contractor that lead time for fabrication and delivery of FRP tanks (after approval of shop drawing submittal) is longer than anticipated, and that the contractor's overall critical path of contract execution is impacted. (Answered: Apr 19, 2019 2:58:02 PM EDT)

#### Question 9

Please provide details for 4" drains and cleanouts. Indicate make and model of cleanout covers, floor drain, and other materials required. (Submitted: Apr 12, 2019 1:27:13 PM EDT)

#### Answer

- See Standard Detail 3305-740 Exterior Cleanout in Volume 1 for cleanout. There are no floor drains in this project. See Standard Detail 2240-101 Drain With Air Gap: manufacturer is called-out. (Answered: Apr 19, 2019 2:58:02 PM EDT)

#### Question 10

2) Painting section 09 90 00 Painting and Coatings:

No Coating system specified for:

Interior Block walls (New and Existing)

Exterior stucco (New and Existing)

Are the interior walls and ceilings of the Electrical and compressor room part of the painting scope. (Extensive electrical work)

Are painting of the electrical conduits part of the painting scope??

If so there is extensive electrical work in all the ceiling in all rooms.

All 3 Degassifier vessels gets painted as per Coating system No. 25, does this include all ducts and blowers/motors.

Are the blue painted piping, pumps and motors part of the repainting scope? (Submitted: Apr 15, 2019 1:13:18 PM EDT)

#### Answer

- For restoration to painting damage on the interior surfaces of the CMU walls (new and existing) inside the hypochlorite storage room, paint System 22 per spec section 09 90 00-3.07-E shall be used. For restoration to painting damage on the exterior surfaces of the stucco walls including stucco delamination repair (new and existing) outside the hypochlorite storage room, use Sherman Williams ConFlex Sherlastic elastomeric coating system, or equal. Surface preparation and priming shall be in explicit accordance with paint manufacturer's directions. No work is scheduled for the electrical and compressor room. No painting of these areas is included in this contract other than damage as a result of contractor's activities.

No painting of elec. conduits required. There are only two degasifier vessels. Only the vessels are to be painted.

The blue painted piping, pumps and motors are not part of the repainting scope. (Answered: Apr 19, 2019 2:58:02 PM EDT)

#### Question 11

3) Chemical Resistant Coatings Painting section 09 96 35:

Is coating of the inside trenches required??

Is coating of the outside trenches required??

Is coating of the outside fill vaults required ??

is coating of the walls and ceilings above the containment walls required and what is the coating system???

(Submitted: Apr 15, 2019 1:13:32 PM EDT)

**Answer**

- Coating of the inside trenches is required.

Coating of the outside trenches, outside fill vaults, and walls and ceilings above the containment walls is not required. (Answered: Apr 19, 2019 2:58:02 PM EDT)

**Question 12**

Please confirm which containments need to be coated and are part of our scope: and identify the 09 96 00 coating system

Sodium Hypochlorite bulk storage containment.

Fluoride Bulk Storage Tank

Corrosion Inhibitor bulk storage tank.

Sodium Hydroxide Room.

Ammonia Room. (Submitted: Apr 15, 2019 1:13:40 PM EDT)

**Answer**

- 09 96 00 coating system is Mat-Reinforced Vinyl Ester (System CRC-1).

The Sodium Hypochlorite bulk storage containment is to be coated.

The Fluoride Bulk Storage Tank, Corrosion Inhibitor bulk storage tank, Sodium Hydroxide Room, and Ammonia Room are not to be coated. (Answered: Apr 19, 2019 2:58:02 PM EDT)

**Question 13**

All piping and valves appear to be CPVC per spec but section 40 27 01 calls out a clear PVC strainer. Please confirm the strainer materials of construction. (Submitted: Apr 16, 2019 9:37:37 AM EDT)

**Answer**

- The strainer materials of construction are to be clear PVC. (Answered: Apr 19, 2019 2:58:02 PM EDT)

**Question 14**

Is a new concrete pad required for the CIP pump and if so provide a detail? (Submitted: Apr 16, 2019 9:53:48 AM EDT)

**Answer**

- Yes, the CIP pump shall be provided with a new concrete pad per Standard Detail 0330-056H Concrete Equipment Pad in Volume 1. (Answered: Apr 19, 2019 2:58:02 PM EDT)

**Question 15**

Dwg I-01 shows level sensors for the bulk tanks but no transmitters. A transmitter is shown for the level sensor at the day tank. Please confirm no level transmitters are required for the bulk tanks. (Submitted: Apr 16, 2019 10:59:28 AM EDT)

**Answer**

- If the bulk tank level sensors being supplied are of the same manufacturer or compatible with the existing transmitters, then no new transmitters are required for the bulk storage tanks. If they are not compatible, then new transmitters are required. (Answered: Apr 19, 2019 2:58:02 PM EDT)

**Question 16**

special conditions part 09 shows allowance of \$55,000. Bidsync shows an allowance of \$50,000. Which is correct? Will the allowance automatically be added to our base bid entered on Bidsync? (Submitted: May 2, 2019 1:00:40 PM EDT)

**Answer**

- The correct allowance will be \$55,000.00 (Answered: May 6, 2019 9:18:49 AM EDT)

**Question 17**

The Q&A on Bidsync refers to volume 1 drawings. There are no volume 1 drawings on the Bidsync site. Please provide the volume 1 drawings referenced by the Q&A. (Submitted: May 2, 2019 1:00:51 PM EDT)

**Answer**

- Please review addendum 1, to obtain the drawing you will have to submit CITY OF FORT LAUDERDALE PLAN AND SPECIFICATION REQUEST FORM. (Answered: May 6, 2019 9:22:19 AM EDT)

**Question 18**

Question #7 allows for HDXLPE tanks as an alternate to the base bid FRP tanks. These materials of construction are considerable different especially when considering Alternate #2 & #3 (15 & 25-yr warranties). Not to mention the cost difference between them.

In order to provide for an apples to apples comparison in the bidding, please indicate which product should be used for the base bid? We would recommend an deductive/additive alternate for the HDXLPE. (Submitted: May 6, 2019 12:34:14 PM EDT)

**Answer**

- Please review correction on answer for questions number seven. (Answered: May 17, 2019 11:10:59 AM EDT)

**Question 19**

Due to the harsh conditions the chemical tanks will withstand (South Florida heat, low ventilation, and the type of chemical to be stored), it is hard to believe the HDXLPE tanks will meet the Alternate #2 warranty of 5-year base plus 10-years additional warranty. This also goes for the FRP tanks as well, however proper maintenance and inspection of the tanks may meet the requirement. The Alternate #3 warranty of 5-year base plus 20-years additional warranty is nearly impossible to meet with either HDXLPE or FRP. Not to mention, the difficulty of removing and replacing tank(s) in the event that one tank fails. Not to mention, who knows if the same tank manufacturers or Contractors will be around in 25-years.

We ask the Engineer/Owner to reconsider these alternates as they seem unreasonable. (Submitted: May 6, 2019 12:46:20 PM EDT)

**Answer**

- It is the bidders decision whether to bid a price for these alternative items or just enter 0. (Answered: May 17, 2019 11:10:59 AM EDT)