



**Hallandale Beach**  
PROGRESS. INNOVATION. OPPORTUNITY.

**CONTRACT DOCUMENTS FOR**  
**WATER TREATMENT PLANT**  
**COATINGS AND STUCCO REPAIRS**

**Volume I**

**DIVISIONS 1 through 17**

**BID SET**  
**September 2015**

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CITY OF HALLANDALE BEACH, FLORIDA  
WATER TREATMENT PLANT  
COATINGS AND STUCCO REPAIRS

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## SECTION 01010 - SUMMARY OF WORK

### PART 1 -- GENERAL

#### 1.01 THE REQUIREMENT

- A. The work to be performed under this Contract shall consist of furnishing of all tools, equipment, materials, supplies, manufactured articles, transportation and services, including fuel, power, water, and essential communications, for the performance of all labor, work, testing and/or other operations as required for the fulfillment of the Contract in strict accordance with the Contract Documents. The work shall be complete, and all work, materials, and services not expressly shown or called for in the Contract Documents which may be necessary for the complete and proper execution of the contract in good faith shall be performed, furnished, and/or provided by the Contractor as though originally so specified or shown, at no increase in cost to the Owner.
- B. The work is at the City of Hallandale Beach Water Treatment Plant, located at:  

630 NW 2nd St  
Hallandale Beach, FL 33009
- C. Wherever the Contract Documents address a third party, i.e., subcontractor, manufacturer, etc., it is to be considered as the Contractor through the third party.
- D. Wherever a reference to number of days is noted, it shall be construed to mean calendar days.
- E. The Contractor is advised that the work is to be performed in a fully operational water treatment facility, which is the principal source of potable water supply for the City of Hallandale Beach. Work activities will be on electrical systems that control equipment active in the treatment process. The Contractor shall be fully responsible for all precautionary measures together with all remediation, cleanup, disinfection, regulatory agency fines and all other labor, materials, and costs associated with any contamination of the potable water supply or interruption of water treatment caused directly or indirectly by the activities of the Contractor in the performance of the work.
- F. Notwithstanding other indemnification requirements of the Contract Documents, the Contractor shall also indemnify, defend, and hold harmless the Owner, the Engineer and the Owner's agents from any and all legal action which may arise from contamination of the potable water supply or interruption of water treatment caused directly or indirectly by the Contractor in the performance of the work.

#### 1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. The work of the Contract at the City of Hallandale Beach Water Treatment Plant is generally composed of the following: 1) stucco repairs; 2) coating exterior surfaces of concrete and masonry structures; 3) coating exterior surfaces of metal tanks, walkways and handrails, and 4) coating all above ground exterior piping, valves, fittings and supports.

- B. The Work set forth within these bid documents includes the furnishing of all labor, materials, equipment, services and incidentals, including all associated piping, and all appurtenant work, complete, tested and ready for operation, all in conformance with Contract Document requirements.

### 1.03 WORK BY OTHERS

- A. The Contractor's attention is directed to the fact that other contractors will conduct other work at the site(s) during the performance of the work under this Contract. The Contractor shall conduct its operations so as to cause a minimum of interference with the work of such other contractors, and shall cooperate fully with such contractors to provide continued safe access to their respective portions of the site, as required to perform their respective contracts.
- B. When two or more contracts are being executed at one time on the same or adjacent areas in such manner that work on one contract may interfere with that on another, the Owner shall determine the sequence and order of the work. When the territory of one contract is the necessary or convenient means of access for the execution of another contract, such privilege of access or any other reasonable privilege may be granted by the Owner to the Contractor so desiring, to the extent, amount, in the manner, and at the times permitted. No such decision as to the method or time of conducting the work or the use or territory shall be made the basis of any claim of delay or damage.
- C. Interference with Work on Utilities: The Contractor shall cooperate fully with all utility forces of the Owner or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the work, and shall schedule the work so as to minimize interference with said relocation, altering, or other rearranging of facilities.

### 1.04 CONTRACTOR USE OF PROJECT SITE

- A. Staging Plan: The Contractor's use of the project site shall be limited to its construction operations, including on-site storage of materials, on-site fabrication facilities, and field offices, as noted on the "Proposed Site Plan" in the Contract Drawings.
- B. The Contractor shall confine his operations within the Contract limits shown on the Drawings and/or property lines and/or fence lines. Storage of equipment and materials, or erection and use of sheds outside of the Contract limits, if such areas are the property of the Owner, shall be used only with the Owner's approval. Such storage or temporary structures, even within the Contract's limits, shall be confined to the Owner's property and shall not be placed on properties designated as easements or rights-of-way unless specifically permitted elsewhere in the Contract Documents.

### 1.05 OWNER USE OF THE PROJECT SITE

- A. The Owner may utilize all or part of the facilities during the entire period of construction for the conduct of the Owner's normal operations. The Contractor shall cooperate with the Owner to minimize interference with the Contractor's operations and to facilitate the Owner's operations.

## 1.06 PERMITS

- A. All permit application fees for Contractor obtained permits will be paid for by the Owner. Payment for permit fees will be based upon the actual permit fees required by the Contractor from the various agencies having jurisdiction for construction of the project, in accordance with the Contract Documents. The Contractor shall produce documentation verifying the actual cost of permit application fees. Only permit application fees substantiated by the Contractor and approved by the Engineer will be paid by the Owner.
- B. It shall be the Contractor's responsibility to secure all permits of every description required to initiate and complete the work under this contract, except permits obtained by the Owner.
- C. Permits that have been (or will be) obtained by the Owner or its authorized representative (copies are available to the Contractor upon request), include the following:
  - 1. Public Drinking Water Facility Construction Permit from the Broward County Health Department.
  - 2. The Engineer shall provide signed and sealed drawings that include the Broward County Health Department approval stamp.

## 1.07 FIELD ENGINEERING

- A. All work to be performed that is shown on Drawings and in the Contract Documents shall be field approved by the Engineer and Owner prior of executing the work.

## 1.08 SITE CONDITIONS

- A. The Contractor acknowledges that it has investigated prior to bidding and satisfied itself as to the conditions affecting the work, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, river stages, tides, water tables or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the work. The Contractor further acknowledges that it has satisfied itself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, or any contiguous site, as well as from information presented by the Drawings and Specifications made a part of this Contract, or any other information made available to it prior to receipt of Bids. Any failure by the Contractor to acquaint itself with the available information will not relieve it from responsibility for estimating properly the difficulty or cost of successfully performing the work. The Owner assumes no responsibility for any conclusions or interpretations made by the Contractor on the basis of the information made available by the Owner.

## 1.09 DIMENSIONS OF EXISTING FACILITIES

- A. Where the dimensions and locations of existing improvements are of critical importance in the installation or connection of new work, the Contractor shall verify such dimensions and

locations in the field prior to bidding, fabrication and/or installation of materials or equipment, which are dependent on the correctness of such information.

#### 1.10 UTILITY LOCATIONS

- A. To the extent possible, existing utility lines in the project area have been shown as represented on the available record drawings and surveys referenced earlier. However, neither the Owner and/or Engineer guarantee that all lines are shown, or that said lines are in their true location. It shall be the Contractor's responsibility to identify and locate all underground or overhead utility lines or equipment affected by the project. No additional payment will be made to the Contractor because of discrepancies in actual and plan location of utilities and damages suffered as a result thereof of lines shown on the plans.
- B. All overhead, surface or underground structures and/or utilities encountered are to be carefully protected from damage or displacement. All damage to said structures and/or utilities is to be completely repaired within a reasonable time; needless delay will not be tolerated. The City reserves the right to remedy any damage by ordering outside parties to make repairs at the expense of the Contractor. All repairs made by the Contractor are to be made to the satisfaction of the Owner and shall be inspected by a representative of the Owner.
- C. The Contractor shall arrange for positive underground location, relocation or support of utilities where they may be in conflict with or endangered by the proposed Work.
- D. Relocations of existing utilities for the convenience of the Contractor shall be at Contractor expense.

#### 1.11 FIRE PROTECTION

- A. Contractor shall take all necessary precautions to prevent fires at or adjacent to the work, buildings, etc., and shall provide adequate facilities for extinguishing fires which do occur.
- B. When fire or explosion hazards are created in the vicinity of the work as a result of the locations of fuel tanks, or similar hazardous utilities or devices, the Contractor shall immediately alert the local Fire Marshal, the Engineer, and the Owner of such tank or device. The Contractor shall exercise all safety precautions and shall comply with all instructions issued by the Fire Marshal and shall cooperate with the Owner of the tank or device to prevent the occurrence of fire or explosion.

#### 1.12 CHEMICALS

- A. All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, or reactant of other classification, must show approval of either the EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with all applicable rules and regulations.

### 1.13 FIRST AID FACILITIES AND ACCIDENTS

- A. First Aid Facilities: The Contractor shall provide at the site such equipment and facilities as are necessary to supply first aid to any of his personnel who may be injured in connection with the work.

### 1.14 BLASTING AND EXPLOSIVES

- A. Blasting shall not be allowed.

### 1.15 WEATHER CONDITIONS

- A. No work shall be done when the weather is unsuitable. The Contractor shall take necessary precautions (in the event of impending storms) to protect all work, materials, or equipment from damage or deterioration due to floods, driving rain, or wind. The Owner reserves the right, through the opinion of the Engineer, to order that additional protection measures over and beyond those proposed by the Contractor, be taken to safeguard all components of the Project. The Contractor shall not claim any compensation for such precautionary measures so ordered, nor claim any compensation from the Owner for damage to the work from weather elements.
- B. The mixing and placing of concrete products or coatings shall be stopped during rainstorms, if ordered by the Engineer; and all freshly placed work shall be protected by canvas or other suitable covering in such manner as to prevent running water from coming in contact with it. Sufficient coverings shall be provided and kept ready at hand for this purpose. The limitations and requirements for mixing and placing concrete products or coatings in cold weather shall be as described elsewhere in these Specifications.

### 1.16 PERIODIC CLEANUP: BASIC SITE RESTORATION

- A. Disposal of Debris: All debris, materials, piping, and miscellaneous waste products from the work described in this section shall be removed from the project as soon as possible and not less than twice per week. They shall be disposed of in accordance with applicable federal, state, and local regulations. The Contractor is responsible for determining these regulations and shall bear all costs or retain any profit associated with disposal of these items.
- B. The Contractor shall perform the cleanup work on a regular basis and as frequently as ordered by the Engineer. Basic site restoration in a particular area shall be accomplished immediately following the installation or completion of the required facilities in that area. Furthermore, such work shall also be accomplished, when ordered by the Engineer, if partially completed facilities must remain incomplete for some time period due to unforeseen circumstances.
- C. Upon failure of the Contractor to perform periodic cleanup and basic restoration of the site to the Engineer's satisfaction, the Owner may, upon five (5) days prior written notice to the Contractor, without prejudice to any other rights or remedies of the Owner, cause such work for which the Contractor is responsible to be accomplished to the extent deemed necessary by the Engineer, and all costs resulting therefrom shall be charged to the Contractor and deducted from the amounts of money that may be due him.



#### 1.17 USE OF FACILITIES BEFORE COMPLETION

- A. The Owner reserves the right to enter and use any portion of the constructed facilities before final completion of the whole work to be done under this Contract. However, only those portions of the facilities which have been completed to the Engineer's satisfaction, as evidenced by his issuing a Certificate of Substantial Completion covering that part of the work, shall be placed in service.
- B. It shall be the Owner's responsibility to prevent premature connections to or use of any portion of the installed facilities by private or public parties, persons or groups of persons, before the Engineer issues his Certificate of Substantial Completion covering that portion of the work to be placed in service.
- C. Consistent with the approved progress schedule, the Contractor shall cooperate with the Owner, his agents, and the Engineer to accelerate completion of those facilities, or portions thereof, which have been designated for early use by the Owner.

PART 2 -- PRODUCTS (Not Used)

PART 3 -- EXECUTION (Not Used)

- END OF SECTION -

## SECTION 01025 - MEASUREMENT AND PAYMENT

### PART 1 -- GENERAL

#### 1.01 THE REQUIREMENT

- A. Payment for the various items in the Schedule of Payment items, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, taxes, materials, commissions, transportation and handling, bonds, permit fees, insurance, overhead and profit, and incidentals appurtenant to the items of Work being described, as necessary to complete the various items of the Work, all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, and including all costs of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA). Such compensation shall also include payment for any loss or damages arising directly or indirectly from the Work.
- B. The Contractor's attention is called to the fact that the quotations for the various items of Work are intended to establish a total price for completing the Work in its entirety. Should the Contractor feel that the cost for any item of Work has not been established by the Schedule of Payment items or this Section, it shall include the cost for that Work in some other applicable bid item, so that its proposal for the project does reflect its total price for completing the Work in its entirety.

#### 1.02 SUBMITTALS

- A. Informational:
  - 1. Schedule of Values.
  - 2. Application for Payment.
  - 3. Final Application for Payment.
- B. Submittals shall be in accordance with Section 01300 entitled "Submittals" and the Owner's standards.

#### 1.03 SCHEDULE OF VALUES

- A. Prepare a schedule of values for the Work.
- B. Unit Price Work: Reflect unit price quantity and price breakdown from conformed Bid Form.
- C. Lump Sum Work:

1. Reflect schedule of values format included in conformed Bid Form.
  2. List Bonds and insurance premiums, mobilization, demobilization, facility startup, and contract closeout separately.
  3. Break down by Divisions 1 through 17 with appropriate subdivision of each Specification.
- D. An unbalanced or front-end loaded schedule will not be acceptable.
- E. Summation of the complete schedule of values representing all the Work shall equal the Contract Price.
- F. The Contractor shall submit a Schedule of Values for review with the return of the executed Agreement to the Owner. The schedule shall contain the installed value of the component parts of Work for the purpose of making progress payments during the construction period.
- G. The schedule shall be given in sufficient detail for proper identification of Work accomplished. The Schedule of Values shall directly correlate to each activity outlined in the construction progress schedule and the construction network analysis (specified in the section entitled "Submittals") to accurately relate construction progress to the requested payment. Each item shall include its proportional share of all costs including the Contractor's overhead, contingencies and profit. The sum of all scheduled items shall equal the total value of the Contract.
- H. If the Contractor anticipates the need for payment for materials stored on the project site or off-site in bonded warehouse, it shall also submit a separate list covering the cost of materials, delivered and unloaded with taxes paid. This list shall also include the installed value of the item with coded reference to the Work items in the Schedule of Values. Payment for stored materials shall comply with requirements of General Conditions.

#### 1.04 APPLICATION FOR PAYMENT

- A. Transmittal Summary Form: Attach one Summary Form with each detailed Application for Payment 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. Include accepted schedule of values for each portion of Work and the unit price breakdown for the Work to be paid on unit price basis, and a listing of Owner-selected equipment, if applicable, and allowances, as appropriate.
- D. Preparation:
  1. Round values to nearest dollar.

2. List each Change Order and Written Amendment executed prior to date of submission as separate line item. Totals to equal those shown on the Transmittal Summary Form.
3. Submit Application for Payment, including a Transmittal Summary Form and detailed Application for Payment Form, a listing of materials on hand as applicable, and such supporting data as may be requested by Owner.

#### 1.05 MEASUREMENT—GENERAL

- A. Weighing, measuring, and metering devices used to measure quantity of materials for Work shall be suitable for purpose intended and conform to tolerances and Specifications as specified in National Institute of Standards and Technology, Handbook 44.
- B. Whenever pay quantities of material are determined by weight, material shall be weighed on scales furnished by Contractor and certified accurate by state agency responsible. Weight or load slip shall be obtained from weigher and delivered to Owner or Owner's representative at point of delivery of material.
- C. If material is shipped by rail, car weights will be accepted provided that actual weight of material only will be paid for and not minimum car weight used for assessing freight tariff, and provided further that car weights will not be acceptable for material to be passed through mixing plants.
- D. Vehicles used to haul material being paid for by weight shall be weighed empty daily and at such additional times as required by Owner. Each vehicle shall bear a plainly legible identification mark.
- E. Materials that are specified for measurement by the cubic yard measured in the vehicle shall be hauled in vehicles of such type and size that actual contents may be readily and accurately determined. Unless all vehicles are of uniform capacity, each vehicle must bear a plainly legible identification mark indicating its water level capacity. Vehicles shall be loaded to at least their water level capacity. Loads hauled in vehicles not meeting above requirements or loads of a quantity less than the capacity of the vehicle, measured after being leveled off as above provided, will be subject to rejection, and no compensation will be allowed for such material.
- F. Where measurement of quantities depends on elevation of existing ground, elevations obtained during construction will be compared with those shown on Drawings. Variations of 1 foot or less will be ignored, and profiles shown on Drawings will be used for determining quantities.
- G. Units of measure shown on Bid Form shall be as follows, unless specified otherwise. All methods of measurement shall be approved by the Owner.

Item	Method of Measurement
AC	Acre—Field Measure
CY	Cubic Yard—Field Measure within limits specified or shown, or measured in vehicle by volume, as specified
EA	Each—Field Count
GAL	Gallon—Field Measure
HR	Hour
LB	Pound(s)—Weight Measure by Scale
LF	Linear Foot—Field Measure
LS	Lump Sum—Unit is one; no measurement will be made
SF	Square Foot
SY	Square Yard
TON	Ton—Weight Measure by Scale (2,000 pounds)

1.06 PAYMENT

A. General:

1. Progress payments will be made monthly.
2. The date for Contractor's submission of monthly Application for Payment shall be established at the Preconstruction Conference.

- B. Payment for Lump Sum Work covers all Work specified or shown including but not limited to all material, labor, and equipment for all structural, architectural, mechanical, electrical, fire alarm system, instrumentation, controls, plumbing, ventilation, air conditioning, earthwork, civil work, irrigation, landscaping, painting, roadway paving and signage, operation and maintenance manuals, facility staff training, spare parts, startup and testing, final site work, together with all other appurtenant and miscellaneous work required for a complete installation as indicated in the Contract Documents. Payments for lump sum work will be made at the contract lump sum price(s) entered on the Proposal. All items of work not included but required to complete the work shall be included in the lump sum bid amount. Payment for Lump Sum Work covers all Work specified or shown for the following items:

<b>Phase-I - Stucco Repair &amp; Coating</b>	
<b>ITEM</b>	<b>DESCRIPTION</b>
1. Not Used	
2. Mobilization	<p>Payment for mobilization will be based upon the lump sum price named for such work, in accordance with the requirements of the Contract Documents.</p> <p style="text-align: right;"><b>Mobilization</b> <u>1</u> <b>LS</b></p>
3. Stucco Repair Unit Price	<p>Payment for stucco repairs to include removing spalled stucco, replacing damaged corner beads, stucco stops, mesh and reveals, surface preparation and installing new stucco, will be based upon the measured square feet of repaired stucco. Included in the item is all material, labor, and equipment for all work required for complete stucco repairs of exterior concrete surfaces of existing structures. All items of work not included but required to complete the work shall be included in the unit price bid amount.</p> <p style="text-align: right;"><b>Stucco Repair</b> <u>1</u> <b>Unit Price</b></p>
4. Parapet Flashing Repairs Unit Price	<p>Payment for removing existing parapet flashing material and accessories and installing new parapet flashing material due to adjacent stucco repairs will be based upon the measured square feet of installed flashing material. Included in the item is all material, labor, and equipment for all work required for a complete installation of parts, materials, and accessories for the repair of unknown conditions related to parapet flashing adjacent to stucco repairs. All items of work not included but required to complete the work shall be included in the unit price bid amount.</p> <p style="text-align: right;"><b>Parapet Flashing Repair</b> <u>1</u> <b>Unit Price</b></p>
5. Concrete Crack Repairs Unit Price	<p>Payment for cutting v-shaped groove along the crack length and filling the grove with an epoxy based grout will be based upon the measured linear feet of repaired cracks. Included in the item is all material, labor, and equipment for all work required for a complete concrete crack repairs. All items of work not included but required to complete the work shall be included in the unit price bid amount.</p> <p style="text-align: right;"><b>Concrete Crack Repairs</b> <u>1</u> <b>Unit Price</b></p>

ITEM	DESCRIPTION
<p>6. <u>Membrane Plant:</u> For all costs of pre-coating surface preparations and coating exterior stucco, masonry and concrete surfaces; painting exterior metal doors, frames and caulking windows, doors and louvers.</p>	<p>Payment for surface preparation and coating exterior stucco, masonry and concrete surfaces, painting exterior metal doors and caulking windows, doors and louvers, and removing building sign will be based upon the lump sum price entered on the Bid Proposal Form. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.</p> <p><b>Membrane Plant Surface Preparation and Coatings</b>  <u>1</u> LS</p>
<p>7. <u>Generator Building:</u> For all costs of pre-coating surface preparations and coating exterior stucco, masonry and concrete surfaces; painting exterior metal doors, frames and caulking windows, doors and louvers.</p>	<p>Payment for surface preparation and coating exterior stucco, masonry and concrete surfaces, painting exterior metal doors and caulking windows, doors and louvers, will be based upon the lump sum price entered on the Bid Proposal Form. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.</p> <p><b>Generator Building Surface Preparation and Coatings</b>  <u>1</u> LS</p>
<p>8. <u>Degasifier Structure:</u> For all costs of pre-coating surface preparations and coating exterior stucco, masonry and concrete surfaces; painting exterior metal doors, frames and caulking windows, doors and louvers.</p>	<p>Payment for surface preparation and coating exterior stucco, masonry and concrete surfaces, painting exterior metal doors and caulking windows, doors and louvers, will be based upon the lump sum price entered on the Bid Proposal Form. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.</p> <p><b>Degasifier Structure Surface Preparation and Coatings</b>  <u>1</u> LS</p>

ITEM	DESCRIPTION
9. <u>High Service Pump Station</u> : For all costs of pre-coating surface preparations and coating exterior stucco, masonry and concrete surfaces; painting exterior metal doors, frames and caulking windows, doors and louvers.	<p>Payment for surface preparation and coating exterior stucco, masonry and concrete surfaces, painting exterior metal doors and caulking windows, doors and louvers, will be based upon the lump sum price entered on the Bid Proposal Form. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.</p> <p><b>High Service Pump Station Surface Preparation and Coatings</b>  <u>1</u> LS</p>
10. <u>Filter Buildings</u> : For all costs of pre-coating surface preparations and coating exterior stucco, masonry and concrete surfaces; painting exterior metal doors, frames and caulking windows, doors and louvers.	<p>Payment for surface preparation and coating exterior stucco, masonry and concrete surfaces, painting exterior metal doors and caulking windows, doors and louvers, will be based upon the lump sum price entered on the Bid Proposal Form. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.</p> <p><b>Filter Buildings Surface Preparation and Coatings</b>  <u>1</u> LS</p>
11. <u>Chemical Storage Containment</u> : For all costs of pre-coating surface preparations and coating exterior stucco, masonry and concrete surfaces; painting exterior metal doors, frames and caulking windows, doors and louvers.	<p>Payment for surface preparation and coating exterior stucco, masonry and concrete surfaces, painting exterior metal doors and caulking windows, doors and louvers, will be based upon the lump sum price entered on the Bid Proposal Form. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.</p> <p><b>Chemical Storage Containment Surface Preparation and Coatings</b>  <u>1</u> LS</p>



ITEM	DESCRIPTION
12. <u>Backwash Return Basin</u> : For all costs of pre-coating surface preparations and coating exterior stucco and concrete surfaces.	Payment for surface preparation and coating exterior stucco, masonry and concrete surfaces will be based upon the lump sum price entered on the Bid Proposal Form. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.  <b>Backwash Return Basin Surface Preparation and Coatings</b> <u>1</u> LS
13. <u>Lime Silos</u> : For all costs of pre-coating surface preparations and painting metal tank, handrails, walkways, ladders and miscellaneous metals	Payment for surface preparation and painting exterior metal tank, handrails, walkways, ladders and miscellaneous metals. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.  <b>Lime Silos Surface Preparation and Coatings</b> <u>1</u> LS
14. <u>Water Softening Units</u> : For all costs of pre-coating surface preparations and painting metal tank, handrails, walkways, ladders and miscellaneous metals.	Payment for surface preparation and painting exterior metal tanks, handrails, walkways, ladders and miscellaneous metals. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.  <b>Water Softening Units Surface Preparation and Coatings</b> <u>1</u> LS
15. <u>Fluoride Storage Tank</u> : For all costs of pre-coating surface preparations and painting tank, handrails, walkways, ladders and miscellaneous metals.	Payment for surface preparation and painting exterior tank, handrails, walkways, ladders and miscellaneous metals. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.  <b>Fluoride Storage Tank Surface Preparation and Coatings</b> <u>1</u> LS
Phase-I Total Bid	The sum of BID ITEMS 1 through 15

**Phase-II – Piping and Equipment Painting**

<b>ITEM</b>	<b>DESCRIPTION</b>
<p>16. <u>High Service Pump Station Area:</u> For all costs of surface preparation, painting and piping identification for aboveground piping, fittings, valves, appurtenances, pipe supports, pumps and motors and pump bases, as indicated on Drawing A-12.</p>	<p>Payment for surface preparation, painting and piping identification for aboveground piping, fittings, valves, appurtenances, pipe supports, pumps and motors and pump bases. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.</p> <p><b>High Service Pump Station Area Preparation and Coatings</b></p> <p align="right"><b><u>1</u> LS</b></p>
<p>17. <u>Filters 1-6 and Transfer Pump Station Area:</u> For all costs of surface preparation, painting and piping identification for aboveground piping, fittings, valves, appurtenances, pipe supports, pumps and motors and pump bases, as indicated on Drawing A-12.</p>	<p>Payment for surface preparation, painting and piping identification for aboveground piping, fittings, valves, appurtenances, pipe supports, pumps and motors and pump bases. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.</p> <p><b>Filters 1-6 and Transfer Pump Station Area Preparation and Coatings</b></p> <p align="right"><b><u>1</u> LS</b></p>
<p>18. <u>Filters 7-10 and Fluoride Storage Area:</u> For all costs of surface preparation, painting and piping identification for aboveground piping, fittings, valves, appurtenances, pipe supports, pumps and motors and pump bases, as indicated on Drawing A-12.</p>	<p>Payment for surface preparation, painting and piping identification for aboveground piping, fittings, valves, appurtenances, pipe supports, pumps and motors and pump bases. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.</p> <p><b>Filters 7-10 and Fluoride Storage Area Preparation and Coatings</b></p> <p align="right"><b><u>1</u> LS</b></p>

ITEM	DESCRIPTION
<p>19. <u>Water Softening Units, Lime Storage, Lime Slaking and Sludge and Backwash Basin Area:</u> For all costs of surface preparation, painting and piping identification for aboveground piping, fittings, valves, appurtenances, pipe supports, pumps and motors, pump bases, lime softening units gearbox and motor, as indicated on Drawing A-12.</p>	<p>Payment for surface preparation, painting and piping identification for aboveground piping, fittings, valves, appurtenances, pipe supports, pumps and motors, lime softening units gearbox and motor. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.</p> <p><b>Water Softening Units, Lime Storage, Lime Slaking and Sludge and Backwash Basin Area Preparation and Coatings</b> <b>1 LS</b></p>
<p>20. <u>Concentrate Pump Station, Degasifiers and Sodium Hypochlorite Storage area:</u> For all costs of surface preparation, painting and piping identification for aboveground piping, fittings, valves, appurtenances, pipe supports, pumps and motors and pump bases, as indicated on Drawing A-12.</p>	<p>Payment for surface preparation, painting and piping identification for aboveground piping, fittings, valves, appurtenances, pipe supports, pumps and motors and pump bases. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.</p> <p><b>Concentrate Pump Station, Degasifiers and Sodium Hypochlorite Storage Area Preparation and Coatings</b> <b>1 LS</b></p>

ITEM	DESCRIPTION
21. <u>Well No.3, Well No. 5, Sulfuric Acid Vents, Injection Well and Monitoring Well area:</u> For all costs of surface preparation, painting and piping identification for aboveground piping, fittings, valves, appurtenances, pipe supports, pumps and motors and pump bases, as indicated on Drawing A-12.	Payment for surface preparation, painting and piping identification for aboveground piping, fittings, valves, appurtenances, pipe supports, pumps and motors and pump bases. Included in this item is all material, labor, and equipment for all work required for a complete installation of coatings and surface preparation of items listed here-in and as indicated in the Contract Documents. All items of work not included but required to complete the work shall be included in the lump sum bid amount.  <b>Well No. 3, Well No. 5, Sulfuric Acid Vents, Injection Well and Monitoring Well Area Preparation and Coatings</b> <div style="text-align: right;"><b><u>1</u> LS</b></div>
Phase-II Total Bid	The sum of BID ITEMS 16 through 21

1.07 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.
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.

1.08 ALLOWANCES

- A. The allowances shall be used only at the discretion of and as ordered by the Owner for such items as unforeseen conditions, unforeseeable conflicts between existing elements of work and the proposed work, unit price items exceed estimated quantities, and any associated work requested by the Owner including all labor, materials, and services for modifications or extra work to complete the Project that was anticipated, but not specifically included in this Contract.

- B. Any portion of these allowances that remain after all authorized payments have been made will be withheld from contract payments and will remain with the Owner.

PART 2 -- PRODUCTS (NOT USED)

PART 3 -- EXECUTION (NOT USED)

- END OF SECTION -

## SECTION 01030

### HURRICANE PREPAREDNESS

#### PART 1 -- GENERAL

##### 1.01 HURRICANE PREPAREDNESS PLAN

- A. The Contractor's attention is drawn to the possibility of hurricane or severe storm conditions occurring at the site of work during the course of Contract Work.
- B. The Contractor shall submit to the Engineer and Owner a Hurricane Preparedness Plan. The plan should outline the necessary measures which the Contractor proposes to perform at no additional cost to the Owner in case of a hurricane or severe weather warning.
- C. In the event of inclement weather, or whenever the Owner shall direct, the Contractor shall, and will, cause Subcontractors to protect carefully the Work and materials against damage or injury by reasons of failure on the part of the Contractor or any Subcontractor to so protect the Work. Such Work and materials so damaged shall be removed and replaced at the expense of the Contractor.
  - 1. Hurricane Watch: Upon designation of a hurricane watch, the Contractor shall be responsible for storing all loose supplies and equipment on the job site that may pose a danger. In addition, the Contractor shall remove all bulkheads and plugs in pipelines that would impede drainage in the case of flooding. Structures that may be in danger of floatation shall be flooded. The Contractor shall also cooperate with the Owner in protecting any other structures at the site.
  - 2. Hurricane Warning: No mobile "temporary facility" under the control of or on the property of the Owner shall be staffed during a hurricane warning. Contractor facilities meeting these criteria shall be evacuated. Reasonable steps shall be taken to protect all such facilities and their contents from damage and to avoid the facility causing damage to the surroundings.
- D. The Contractor may be required to backfill excavation depending on the severity of the approaching storm or the expected amount of rainfall. Additionally, erosion protection and inlet protection may also be required by the Owner depending on the site conditions at the time of the Hurricane Watch.

#### PART 2 -- PRODUCTS - (Not Used)

#### PART 3 -- EXECUTION - (Not Used)

- END OF SECTION -

## SECTION 01070 - ABBREVIATIONS

### PART 1 -- GENERAL

#### 1.01 THE REQUIREMENT

- A. Wherever in these specifications references are made to the standards, specifications, or other published data of the various national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only. As a guide to the user of these specifications, the following acronyms or abbreviations which may appear in these specifications shall have the meanings indicated herein.

#### 1.02 ABBREVIATIONS AND ACRONYMS

AAMA	Architectural Aluminum Manufacturer's Association
AASHTO	American Association of the State Highway and Transportation Officials
ACI	American Concrete Institute
ACOE	Army Corps of Engineers
ACPA	American Concrete Pipe Association
AFBMA	Anti-Friction Bearing Manufacturer's Association, Inc.
AGMA	American Gear Manufacturer's Association
AHGDA	American Hot Dip Galvanizers Association
AI	The Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute, Inc.
APA	American Plywood Association
API	American Petroleum Institute
APHA	American Public Health Association
APWA	American Public Works Association
ASA	Acoustical Society of America
ASAE	American Society of Agriculture Engineers
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers

ASLE	American Society of Lubricating Engineers
ASME	American Society of Mechanical Engineers
ASMM	Architectural Sheet Metal Manual
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BCEPGMD	Broward County Environmental Protection and Growth Management Department
BCHD	Broward County Health Department
BHMA	Builders Hardware Manufacturer's Association
CMA	Concrete Masonry Association
CRSI	Concrete Reinforcing Steel Institute
DIPRA	Ductile Iron Pipe Research Association
EIA	Electronic Industries Association
ETL	Electrical Test Laboratories
FBC	Florida Building Code
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FS	Federal Specifications
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IPCEA	Insulated Power Cable Engineers Association
ISA	Instrument Systems and Automation
ISO	International Organization for Standardization
MBMA	Metal Building Manufacturers Association
MMA	Monorail Manufacturers Association
MTI	Marine Testing Institute
NAAM	National Association of Architectural Metal Manufacturers
NACE	National Association of Corrosion Engineers
NBS	National Bureau of Standards



NEC	National Electrical Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NIOSH	National Institute of Occupational Safety and Health
NIST	National Institute of Standards and Testing
NRCA	National Roofing Contractors Association
NSF	National Science Foundation
NTMA	National Tile and Marble Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
SMACCNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Society for Protective Coatings
SSPWC	Standard Specifications for Public Works Construction
SFWMD	South Florida Water Management District
UL	Underwriters Laboratories, Inc.

PART 2 -- PRODUCTS (Not Used)

PART 3 -- EXECUTION (Not Used)

- END OF SECTION –

## SECTION 01090 - REFERENCE STANDARDS

### PART 1 -- GENERAL

#### 1.01 THE REQUIREMENT

- A. Titles of Sections and Paragraphs: Captions accompanying specification sections and paragraphs are for convenience of reference only, and do not form a part of the Specifications.
- B. Applicable Publications: Whenever in these Specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date of the opening of bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the Drawings shall be waived because of any provision of, or omission from, said standards or requirements.
- C. Specialists, Assignments: In certain instances, Specification text requires (or implies) that specific work is to be assigned to specialists or expert entities, who must be engaged for the performance of that work. Such assignments shall be recognized as special requirements over which the Contractor has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the Work; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of contract requirements remains with the Contractor.

#### 1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Without limiting the generality of other requirements of the specifications, all work specified herein shall conform to or exceed the requirements of all applicable codes.
- B. References herein to "Building Code" shall mean the Florida Building Code (FBC) Broward Edition. The latest edition of the code as approved and used by the local agency as of the date of the opening of bids, as adopted by the agency having jurisdiction, shall apply to the Work herein, including all addenda, modifications, amendments, or other lawful changes thereto.
- C. In case of conflict between codes, reference standards, Drawings and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the Engineer for clarification and directions prior to ordering or providing any materials or labor. The Contractor shall follow the most stringent requirements.

- D. Applicable Standard Specifications: The Contractor shall construct the Work specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and Specifications listed herein.
- E. References herein to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- F. References herein to "OSHA Standards" shall mean Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

PART 2 -- PRODUCTS (Not Used)

PART 3 -- EXECUTION (Not used)

-END OF SECTION-

## SECTION 01200 - PROJECT MEETINGS

### PART 1 -- GENERAL

#### 1.01 PRECONSTRUCTION MEETING

A. General: A preconstruction meeting will be held after Award of Contract, but prior to starting work at the site. The Engineer will schedule the meeting at a mutually agreed time.

B. Location:

City of Hallandale Beach Water Treatment Plant  
630 NW 2nd St  
Hallandale Beach, FL 33009  
Contact: Ms. Mariana Pitiriciu, PE, PMP  
Phone: (954) 457-3042

C. Attendance:

1. Owner
2. Engineer
3. Contractor
4. Major Subcontractors
5. Safety representative
6. Representatives of governmental or other regulatory agencies.

D. Minimum Agenda: The purpose of the meeting is to designate responsible personnel and establish a working relationship. The agenda will include, but not limited to the following:

1. Tentative construction schedule
2. Critical work sequencing
3. Designation of responsible personnel
4. Processing of Field Decisions and Change Orders
5. Adequacy of distribution of Contract Documents
6. Submittal of Shop Drawings and samples
7. Procedures for maintaining record documents

8. Use of site and Owner's requirements
9. Major equipment deliveries and priorities
10. Safety and first aid procedures
11. Security procedures
12. Housekeeping procedures
13. Processing of Partial Payment Requests
14. General regard for community relations

E. Duties: The Engineer will preside at the meeting and will keep and distribute meeting minutes.

#### 1.02 PROGRESS MEETING

A. Frequency: Progress meetings will be held as needed when requested by the Engineer.

B. Meeting Location:

City of Hallandale Beach Water Treatment Plant  
630 NW 2nd St  
Hallandale Beach, FL 33009

#### PART 2 -- PRODUCTS

(NOT USED)

#### PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

## SECTION 01300 - SUBMITTALS

### PART 1 - GENERAL

#### 1.01 THE REQUIREMENT

- A. This section specifies the means of all submittals. All submittals, whether their final destination is to the Owner, Engineer, or other representatives of the Owner, shall be directed through the Engineer. A general summary of the types of submittals and the number of copies required is as follows:

<u>Copies to Engineer</u>	<u>Submittal Format</u>	<u>Type of Submittal</u>
1	Digital	Progress Schedule
1	Digital	Construction Schedule
1	Digital	Schedule of Payment Items
1	Digital	Progress Estimates
1	Digital	Shop Drawings
3	Paper	Paint Color Selections
1	Digital	Certificates of Compliance
1	Digital	Warranties

*\* Unless otherwise required in the specific Section where requested.*

- B. Paper Submittal Format: Paper submittals shall be hard copy prints of the documents.
- C. Digital Submittal Format: Digital submittals shall be in searchable Adobe PDF format and shall be accessible through the use of standard, "off-the-shelf" software such as Adobe Reader. Hypertext links shall be embedded throughout the text for ease of navigation between references.

#### 1.02 SUBMITTAL PROCEDURES

- A. Transmit each submittal with a form acceptable to the Engineer, clearly identifying the project Contractor, the enclosed material and other pertinent information specified in other parts of this section. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- B. Revise and resubmit submittals as required, identify all changes made since previous submittals. Resubmittals shall be noted as such.
- C. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
- D. Digital Submission Procedures: Digital submission procedures shall be defined during the pre-construction meeting.

#### 1.03 CONSTRUCTION PROGRESS SCHEDULE

- A. The Contractor shall have the capability of preparing and utilizing the specified construction progress scheduling techniques. The Contractor shall submit its proposed progress schedule to the Engineer for review and comment within ten days of the Notice to Award.

- B. The computer generated construction progress schedule and associated report shall include the following tabulations: a list of activities in numerical order, a list of activity precedence, schedules sequenced by Early Start Date, Total Float, and Late Start Date. All schedules shall be in color; black and white schedules will not be accepted. Each schedule and report shall include the following minimum items.
1. Activity Numbers
  2. Estimated Duration
  3. Activity Description
  4. Early Start Date (Calendar Dated)
  5. Early Finish Date (Calendar Dated)
  6. Latest Allowable Start Date (Calendar Dated)
  7. Latest Allowable Finish Date (Calendar Dated)
  8. Status (whether critical)
  9. Estimated Cost of the Activity
  10. Total Float and Free Float
- C. In addition, each construction progress schedule, network analysis and report shall be prefaced with the following summary data:
1. Contract Name and Number
  2. Contractor's Name
  3. Contract Duration and Float
  4. Contract Schedule
  5. The Effective or Starting Date of The Schedule (the date indicated in the Notice-to-Proceed)
- D. The work day to calendar date correlation shall be based on an 8-hour day and 40-hour week with adequate allowance for holidays, adverse weather and all other special requirements of the Work. Normal work hours are Monday through Friday, 8:00 am to 5:00 pm. Exceptions for construction sequencing requirements shall be as noted in the Section entitled "Summary of Work".
- E. If the Contractor desires to make changes in its method of operating which affect the construction progress schedule and related items, it shall notify the Engineer in writing stating what changes are proposed and the reason for the change. If the Engineer accepts these changes, in writing, the Contractor shall revise and submit, without additional cost to the Owner, all of the affected portions of the construction progress schedule, and associated reports. The construction progress schedule and related items shall be adjusted by the Contractor only after prior acceptance, in writing by the Engineer. Adjustments may consist

of changing portions of the activity sequence, activity durations, division of activities, or other adjustments as may be required. The addition of extraneous, nonworking activities and activities which add restraints to the construction progress schedule shall not be accepted.

- F. Except where earlier completions are specified, schedule dates which show completion of all Work prior to the contract completion date shall, in no event, be the basis for claim for delay against the Owner by the Contractor.
- G. Construction progress schedules and related items which contain activities showing negative float or which extend beyond the contract completion date will be accepted only upon the condition that the Contractor will comply with recovery schedule requirements as specified in paragraph H. below.
- H. Whenever it becomes apparent from the current construction progress schedule and associated reports that delays to the critical path have resulted and the contract completion date will not be met, or when so directed by the Engineer, the Contractor shall take some or all of the following actions at no additional cost to the Owner. They shall submit to the Engineer for approval, a written statement of the steps they intend to take to remove or arrest the delay to the critical path in the current construction progress schedule.
  - 1. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of work.
  - 2. Increase the number of working hours per shift, shifts per day, working days per week, the amount of construction equipment, or any combination of the foregoing, sufficiently to substantially eliminate the backlog of work.
  - 3. Reschedule activities to achieve maximum practical concurrence of accomplishment of activities, and comply with the revised schedule.
- I. If when so requested by the Engineer, the Contractor should fail to submit a written statement of the steps they intend to take or should fail to take such steps as reviewed and accepted in writing by the Engineer, the Engineer may direct the Contractor to increase the level of effort in manpower (trades), equipment and work schedule (overtime, weekend and holiday work, etc.) to be employed by the Contractor in order to remove or arrest the delay to the critical path in the current construction progress schedule, and the Contractor shall promptly provide such level of effort at no additional cost to the Owner.
- J. If the completion of any activity, whether or not critical, falls more than 100 percent behind its previously scheduled and accepted duration, the Contractor shall submit for approval a schedule adjustment showing each such activity divided into two activities reflecting completed versus uncompleted work.
- K. Shop drawings which are not approved on the first submittal or within the time scheduled, and equipment which does not pass the specified tests and certifications shall be immediately rescheduled.
- L. The contract time will be adjusted only in accordance with the General Requirements and other portions of the Contract Documents as may be applicable. If the Engineer finds that the Contractor is entitled to any extension of the contract completion date, the Engineer's determination as to the total number of days extension shall be based upon the current construction progress schedule and on all data relevant to the extension. Such data shall be



included in the next updating of the schedule and related items. Actual delays in activities which, according to the construction progress schedule, do not affect any contract completion date will not be the basis for a change therein.

- M. From time to time it may be necessary for the contract schedule of completion time to be adjusted by the Owner in accordance with the General Requirements and other portions of the Contract Documents as may be applicable. Under such conditions, the Engineer will direct the Contractor to reschedule the Work or contract completion time to reflect the changed conditions, and the Contractor shall revise the construction progress schedule and related items accordingly, at no additional cost to the Owner.
- N. Available float time may be used by the Owner through the Owner's Engineer.
- O. The Owner controls the float time and, therefore, without obligation to extend either the overall completion date or any intermediate completion dates, the Owner may initiate changes that absorb float time only. Owner initiated changes that affect the critical path on the network diagram shall be the sole grounds for extending the completion dates. Contractor initiated changes that encroach on the float time may be accomplished only with the Owner's concurrence. Such changes, however, shall give way to Owner initiated changes competing for the same float time.
- P. To the extent that the construction project schedule, or associated report or any revision thereof shows anything not jointly agreed upon or fails to show anything jointly agreed upon, it shall not be deemed to have been accepted by the Engineer. Failure to include on a schedule any element of Work required for the performance of this Contract shall not excuse the Contractor from completing all Work required within any applicable completion date, not withstanding the review of the schedule by the Engineer.
- Q. Review and acceptance of the construction progress schedule, and related reports, by the Engineer is advisory only and shall not relieve the Contractor of the responsibility for accomplishing the Work within the contract completion date. Omissions and errors in the construction progress schedule, and related reports shall not excuse performance less than that required by the Contract and in no way make the Engineer an insurer of the Contractor's success or liable for time or cost overruns flowing from any shortcomings in the construction progress schedule, and related reports.
- R. The Contractor shall present and discuss the proposed schedule at the preconstruction conference.
- S. The construction progress schedule shall be based upon the precedence diagramming method of scheduling and shall be prepared in the form of a horizontal bar chart showing in detail the proposed sequence of the Work and identifying all construction activities included but not limited to yard piping, all structures and treatment units and all related Work specified herein to be performed under the Contract. The schedule shall be time scaled, identifying the first day of each week, with the estimated date of starting and completion of each stage of the Work in order to complete the project within the contract time. The project critical path shall be clearly identified.
- T. The progress schedule shall be plotted on 11-inch by 17-inch paper and shall be revised and updated monthly, depicting progress through the last day of the current month and scheduled progress through completion. Six up to date copies of the schedule shall be submitted along with the application for monthly progress payments for the same period.

- U. The construction progress schedule shall be developed and maintained using MS-Project, Suretrak or equivalent software.

#### 1.04 SCHEDULE OF PAYMENT ITEMS

- A. The Contractor shall submit a Schedule of Payment Items for review within two weeks after receiving the Notice to Proceed. The schedule shall contain the installed value of the component parts of Work for the purpose of making progress payments during the construction period and shall directly correlate on an item by item basis (unless otherwise accepted by the Engineer) to each individual activity detailed in the construction progress schedule. The sum of all scheduled items shall equal the total value of the Contract. Reference the Section entitled "Measurement and Payment" for further details.
- B. If the Contractor anticipates the need for payment for materials stored on the project site, it shall also submit a separate list covering the cost of materials, delivered and unloaded with taxes paid. This list shall also include the installed value of the item with coded reference to the Work items in the Schedule of Payment Items.
- C. The Contractor shall expand or modify the above schedule and materials listing as required by the Engineer's initial or subsequent reviews.

#### 1.05 PROGRESS PAYMENT APPLICATIONS

- 1. Applications for payments shall be made to the Engineer for review in accordance with the Section entitled "Measurement and Payment".

#### 1.06 SHOP DRAWINGS

- A. The Contractor shall submit for review shop drawings for concrete reinforcement, structural details, piping layout and appurtenances, wiring, color selection charts, materials and equipment fabricated especially for this Contract, and materials and equipment for which such Drawings are specified or specifically requested by the Engineer.
- B. Shop drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish or shop coat, grease fittings, etc., depending on the subject of the Drawings.
- C. When so specified, or if considered by the Engineer to be acceptable, the manufacturer's specifications, catalog data, descriptive matter, illustrations, etc. may be submitted for review in place of shop drawings. In such case, the requirements shall be as specified for shop drawings, insofar as applicable.
- D. The Contractor shall be responsible for the prompt submittal of all shop drawings so that there shall be no delay to the Work due to the absence of such Drawings. The Engineer will review the shop drawings within 21 calendar days of receipt of such Drawings. Reviewed shop drawings will be returned to the Contractor by regular mail, posted no later than 21 days after receipt.
- E. Time delays caused by rejection of submittals are not cause for extra charges to the Owner or time extensions.

- F. Requirements: All shop drawings shall be submitted to the Engineer through the Contractor. The Contractor is responsible for obtaining shop drawings from its subcontractors and returning reviewed Drawings to them. All Drawings shall be clearly marked with the name of the project, Owner, Contractor, and building, equipment, or structure to which the drawing applies. Drawings shall be suitably numbered and stamped by the Contractor. Each shipment of Drawings shall be accompanied by a letter of transmittal giving a list of the drawing numbers and the names mentioned above.
- G. Product Data: Where manufacturer's publications in the form of catalogs, brochures, illustrations, or other data sheets are submitted in lieu of prepared shop drawings, such submission shall specifically indicate the particular item offered. Identification of such items and relative pertinent information shall be made with indelible ink. Submissions showing only general information will not be accepted.
- H. Product data shall include materials of construction, dimensions, performance characteristics, capacities, wiring diagrams, piping and controls, etc.
- I. Warranties: When warranties are called for, a sample of the warranty shall be submitted with the shop drawings. The sample warranty shall be the same form that will be used for the actual warranty. Actual warranties shall be originals and notarized.
- J. Work Prior to Review: No material or equipment shall be purchased, fabricated especially for this Contract, or delivered to the project site until the required shop drawings have been submitted, processed and marked either "FURNISH AS SUBMITTED" or "FURNISH AS CORRECTED". All materials and Work involved in the construction shall be as represented by said Drawings.
- K. The Contractor shall not proceed with any portion of the Work (such as the construction of foundations) for which the design and details are dependent upon the design and details of equipment for which submittal review has not been completed.
- L. Contractor's Review: Only submittals which have been checked and corrected should be submitted to the Contractor by its subcontractors and vendors. Prior to submitting shop drawings to the Engineer, the Contractor shall check thoroughly all such Drawings to satisfy itself that the subject matter thereof conforms to the Drawings and Specifications in all respects. Drawings which are correct shall be marked with the date, checker's name and indications of the Contractor's approval, and then shall be submitted to the Engineer. Other Drawings submitted to the Engineer will be returned to the Contractor unreviewed.
- M. Contractor's Responsibility: The Engineer's review of shop drawings will be general and shall not relieve the Contractor of the responsibility for details of design, dimensions, etc., necessary for proper fitting and construction of the Work required by the Contract and for achieving the specified performance.
- N. Contractor's Modifications: For submissions containing departures from the Contract Documents, the Contractor shall include proper explanation in its letter of transmittal. Should the Contractor submit for review equipment that requires modifications to the structures, piping, layout, etc. detailed on the Drawings, it shall also submit for review details of the proposed modifications. If such equipment and modifications are accepted, the Contractor, at no additional cost to the Owner, shall do all Work necessary to make such modifications.

- O. Substitutions: Whenever a particular brand or make of material, equipment, or other item is specified, or is indicated on the Drawings, it is for the purpose of establishing a standard of quality, design, and type desired and to supplement the detailed specifications. Any other brand or make which is equivalent to that specified or indicated may be offered as a substitute subject to the following provisions:
1. The Contractor shall submit for each proposed substitution sufficient details, complete descriptive literature, and performance data together with samples of the materials, where feasible, to enable the Engineer to determine if the proposed substitution is equal, in all respects including, but not limited to, quality, performance, ease of maintenance, availability of spare parts, and experience record.
  2. The Contractor shall submit certified tests, where applicable, by an independent laboratory attesting that the proposed substitution is equal.
  3. A list of installations where the proposed substitution is equal. Such listing shall cover a minimum of the previous five years and will furnish project names and contact phone numbers.
  4. Where the acceptance of a substitution requires excessive review by the Engineer, revision or redesign of any part of the Work, all such additional review costs, revisions and redesign, and all new Drawings and details required therefore, shall be at Contractor expense.
  5. In all cases the Engineer shall be the sole judge as to whether a proposed substitution is to be accepted. The Contractor shall abide by the Engineer's decision when proposed substitute items are judged to be unacceptable and shall in such instances furnish the item as specified. No substitute items shall be used in the Work without written acceptance of the Engineer.
  6. Acceptance of any proposed substitution shall in no way release the Contractor from any of the provisions of the Contract Documents.
  7. Owner may require, at Contractor's expense, a special performance guarantee or other surety with respect to any substitute.
- P. Complete Submittals: Each submittal shall be complete in all aspects incorporating all information and data required to evaluate the products' compliance with the Contract Documents. Partial or incomplete submissions shall be returned to the Contractor without review.
- Q. Shop Drawing Distribution: The Contractor shall submit shop drawings electronically to the Engineer for review. The method of electronic submittal shall be defined during the pre-construction meeting. Shop drawings will be reviewed by the Engineer, stamped and distributed with the appropriate box checked either "FURNISH AS SUBMITTED", "FURNISH AS CORRECTED" or "REVISE AND RESUBMIT". The contractor shall print and distribute shop drawings with the Engineer's review comments as needed.

## 1.07 WARRANTIES

- A. Warranties called for in the Contract Documents shall be originals and submitted to the Owner through the Engineer. When warranties are required they shall be submitted prior to request for payment.
- B. When advance copies of warranties are requested, they shall be submitted with, and considered as shop drawings.

1.08 CERTIFICATES

- A. Four copies of certificates of compliance and test reports shall be submitted for requested items to the Engineer prior to request for payment.

1.09 DAILY REPORTS

The Contractor shall submit detailed daily report at the end of each work day to include specific work done on specific surfaces in specific areas. Daily reports shall include the weather, temperature, humidity, approximate square footage of work completed, daily activities, manpower and equipment. A sample daily report form shall be submitted for the Owner's acceptance.

1.10 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 -

TRANSMITTAL OF CONTRACTOR'S SUBMITTAL

(Attach to Each Submittal)

DATE: \_\_\_\_\_

TO: \_\_\_\_\_

Submittal No. \_\_\_\_\_

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

New Submittal                       Resubmittal

Previous Submittal No.: \_\_\_\_\_

Project: No. \_\_\_\_\_

Project No.: \_\_\_\_\_

Specification Section No.: \_\_\_\_\_

FROM: \_\_\_\_\_

(Cover only one section with each transmittal)  
 Schedule Date of Submittal

Contractor

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

Contains Deviations     Contains No Deviations

SUBMITTAL TYPE:     Shop Drawing  
                                   Quality Control

Contract Closeout                       "Or-Equal"/Substitute  
 Sample

The following items are hereby submitted:

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Spec. 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

## SECTION 01400 - QUALITY CONTROL

### PART 1 -- GENERAL

#### 1.01 THE REQUIREMENT

##### A. Testing Laboratory Services

1. Laboratory testing and checking required by the Specifications, including the cost of transporting all samples and test specimens, shall be provided and paid for by the Owner unless otherwise indicated in the Specifications.
2. Materials to be tested include, but are not necessarily limited to the following: cement, concrete aggregate, concrete, bituminous paving materials, structural and reinforcing steel, waterproofing, select backfill, crushed stone or gravel and sand.
3. Tests required by the Owner shall not relieve the Contractor from the responsibility of supplying test results and certificates from manufacturers or suppliers to demonstrate conformance with the Specifications.
4. Procedure
  - a. The Contractor shall plan and conduct his operations to permit taking of field samples and test specimens, as required, and to allow adequate time for laboratory tests.
  - b. The collection, field preparation and storage of field samples and test specimens shall be as directed by the Engineer with the cooperation of the Contractor.
5. Significance of Tests
  - a. Test results shall be binding on both the Contractor and the Owner, and shall be considered irrefutable evidence of compliance or noncompliance with the Specification requirements, unless supplementary testing shall prove, to the satisfaction of the Owner, that the initial samples were not representative of actual conditions.
6. Supplementary and Other Testing
  - a. Nothing shall restrict the Contractor from conducting tests he may require. Should the Contractor at any time request the Owner to consider such test results, the test reports shall be certified by an independent testing laboratory acceptable to the Owner. Testing of this nature shall be conducted at the Contractor's expense.

## 1.02 IMPERFECT WORK, EQUIPMENT, OR MATERIALS

- A. Any defective or imperfect work, equipment, or materials furnished by the Contractor which is discovered before the final acceptance of the work, as established by the Certificate of Substantial Completion, or during the subsequent guarantee period, shall be removed immediately even though it may have been overlooked by the Engineer and estimated for payment. Any equipment or materials condemned or rejected by the Engineer shall be tagged as such and shall be immediately removed from the site. Satisfactory work or materials shall be substituted for that rejected.
- B. The Engineer may order tests of imperfect or damaged work, equipment, or materials to determine the required functional capability for possible acceptance, if there is no other reason for rejection. The cost of such tests shall be borne by the Contractor; and the nature, tester, extent and supervision of the tests will be as determined by the Engineer. If the results of the tests indicate that the required functional capability of the work, equipment, or material was not impaired, consistent with the final general appearance of same, the work, equipment, or materials may be deemed acceptable. If the results of such tests reveal that the required functional capability of the questionable work, equipment, or materials has been impaired, then such work, equipment, or materials shall be deemed imperfect and shall be replaced. The Contractor may elect to replace the imperfect work, equipment, or material in lieu of performing the tests.

## 1.03 INSPECTION AND TESTS

- A. The Contractor shall allow the Engineer ample time and opportunity for testing materials and equipment to be used in the work. He shall advise the Engineer promptly upon placing orders for material and equipment so that arrangements may be made, if desired, for inspection before shipment from the place of manufacture. The Contractor shall at all times furnish the Engineer and his representatives, facilities including labor, and allow proper time for inspecting and testing materials, equipment, and workmanship. The Contractor must anticipate possible delays that may be caused in the execution of his work due to the necessity of materials and equipment being inspected and accepted for use. The Contractor shall furnish, at his own expense, all samples of materials required by the Engineer for testing, and shall make his own arrangements for providing water, electric power, or fuel for the various inspections and tests of structures and equipment.
- B. The Contractor shall furnish the services of representatives of the manufacturers of certain equipment, as prescribed in other Sections of the Specifications. The Contractor shall also place his orders for such equipment on the basis that, after the equipment has been tested prior to final acceptance of the work, the manufacturer will furnish the Owner with certified statements that the equipment has been installed properly and is ready to be placed in functional operation. Tests and analyses required of equipment shall be paid for by the Contractor, unless specified otherwise in the Section which covers a particular piece of equipment.
- C. Where other tests or analyses are specifically required in other Sections of these Specifications, the cost thereof shall be borne by the party (Owner or Contractor) so



designated in such Sections. The Owner will bear the cost of all tests, inspections, or investigations undertaken by the order of the Engineer for the purpose of determining conformance with the Contract Documents if such tests, inspection, or investigations are not specifically required by the Contract Documents, and if conformance is ascertained thereby. Whenever nonconformance is determined by the Engineer as a result of such tests, inspections, or investigations, the Contractor shall bear the full cost thereof or shall reimburse the Owner for said cost. In this connection, the cost of any additional tests and investigations, which are ordered by the Engineer to ascertain subsequent conformance with the Contract Documents, shall be borne by the Contractor.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -

## SECTION 01510 - UTILITIES AND SERVICES

### PART 1 - GENERAL

#### 1.01 THE REQUIREMENT

- A. The Contractor shall provide utilities and services for its own operations. These shall include electrical power, water, ventilation, sanitary facilities and telephone service. The Contractor shall furnish, install and maintain all temporary utilities during the contract period including removal upon completion of the work. Such facilities shall comply with regulations and requirements of the National Electrical Code, OSHA, Florida Power and Light, and applicable Federal, State and all jurisdictional codes.

#### 1.02 TEMPORARY POWER

- A. The Contractor shall arrange with Florida Power and Light (FPL) for construction period service and pay all costs for the work and power. The Contractor shall arrange and pay for a separate feeder to supply power from off-site directly from FPL service to the Contractor temporary power system. In addition to providing for a safe construction period distribution system the Contractor shall provide a safe and adequate artificial lighting system for work areas which do not have sufficient natural light. Temporary lighting shall be maintained during non-working periods if the area is subject to access by plant personnel.

#### 1.03 TEMPORARY WATER

- A. The Contractor shall supply all water used for construction, flushing, testing, and temporary sanitary facilities. The Contractor shall provide and maintain all piping, fittings, adapters, and valving required. It is the Contractor's responsibility to arrange through the Owner, for location and installation of a 2-inch water meter and backflow preventer at the fire hydrant shown on the drawings. A deposit to be paid by the Contractor is required for meter rental and all water shall be purchased at the prevailing rates.

#### 1.04 TEMPORARY VENTILATION

- A. The Contractor shall provide and maintain adequate ventilation for a safe working environment. In addition, forced air ventilation shall be provided for the curing of installed materials, humidity control and the prevention of hazardous accumulations of dust, gases or vapors, as necessary to comply with contract requirements.

#### 1.05 TEMPORARY SANITARY FACILITIES

- A. The Contractor shall provide and maintain adequate and clean sanitary facilities for the construction work force and visitors. The facilities shall comply with local codes and regulations and be situated at approved locations.

1.06 SECURITY

- A. The Contractor shall be responsible for providing, maintaining and securing gates used for construction purposes for the duration of the project as required for security purposes. Reference the drawings for additional requirements.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

- END OF SECTION -

## SECTION 01520 – MAINTENANCE OF UTILITY OPERATIONS DURING CONSTRUCTION

### PART 1 -- GENERAL

#### 1.01 THE REQUIREMENT

- A. The existing plant will be maintained in continuous operation by the Owner during the entire construction period of the Contract as hereinafter specified. The intent of this Section is to outline the minimum requirements necessary to provide continuous treatment throughout the construction period.
- B. Work under the Contract shall be scheduled and conducted by the Contractor so as not to impede any treatment process except as explicitly permitted hereinafter. In performing the Work shown and specified, the Contractor shall plan and schedule his Work to meet the plant's daily and seasonal operating requirements, and the constraints and construction requirements as outlined in this Section.
- C. The work under the Contract to be performed by the Contractor may be adjacent to, or within, the work area(s) of other work concurrently in progress that is being performed by other contractors on site. Likewise the work under other Contracts may be adjacent to, or within, the work area(s) of the work under the Contract to be performed by the Contractor. The Contractor shall plan, coordinate and schedule his Work with all other contractors on site, to meet the constraints and construction requirements of other Contracts and also meet the plant's daily and seasonal operating requirements as outlined in this Section.
- D. The Contractor shall be responsible for coordinating the general construction and the schedules of electrical, control system, HVAC, plumbing and related trades and for ensuring that permanent or temporary power and controls are available for all existing, proposed, and temporary facilities that are required to be on line at any given time.
- E. The Contractor has the option of providing additional temporary facilities that can eliminate a constraint, provided it is done without cost to the Owner (including additional Owner labor) and provided that all requirements of these Specifications are fulfilled. Work not specifically covered in the following paragraphs may, in general, be done at any time during the contract period, subject to the operating requirements and constraints and construction requirements outlined hereinafter. All references to days in this Section shall be consecutive calendar days.
- F. The Contractor is advised that the Work is to be performed in a fully operational water treatment facility, which is the principal source of potable water supply to the City of Hallandale Beach and associated communities. Work activities include the deployment of personnel, equipment and materials within active potable water treatment units, clearwells and storage facilities. The Contractor shall be fully responsible for all precautionary measures together with all remediation, cleanup, disinfection, regulatory agency fines and all other labor, materials, and costs associated with any contamination of the potable water supply caused directly or indirectly by the activities of the Contractor in the performance of the Work.

- G. Notwithstanding other indemnification requirements of the Contract Documents, the Contractor shall also indemnify, defend, and hold harmless the CITY, the Engineer and the CITY's agents from any and all legal action which may arise from contamination of the potable water supply caused directly or indirectly by the Contractor in the performance of the Work.

## 1.02 GENERAL CONSTRAINTS

- A. The Contractor shall schedule the Work so that the plant is maintained in continuous operation. All treatment processes shall be maintained in continuous operation during the construction period except during approved process interruptions. All short-term system or partial systems shutdowns shall be approved by the Owner and the Engineer. Long-term process shutdowns and diversions shall conform to the requirements hereinafter specified and shall be minimized by the Contractor as much as possible. If in the judgment of the Owner or Engineer, a requested shutdown is not required for the Contractor to perform the Work, the Contractor shall utilize approved alternative methods to accomplish the Work. All shutdowns shall be coordinated with and scheduled at times suitable to the Owner. Shutdowns shall not begin until all required materials are on hand and ready for installation. Each shutdown period shall commence at a time approved by the Owner, in writing. Where required in the Construction Sequence, the Contractor shall proceed with the Work continuously, (24 hours/day, 7 days/week) start to finish, until the Work is completed and normal plant operation is restored.
- B. If the Contractor completes all required Work before the specified shutdown period has ended, the Owner may immediately place the existing system back into service.
- C. The Contractor shall schedule short-term and extended shutdowns in advance and shall present all desired shutdowns in the 30 and 60-day schedules at the construction progress meetings. Shutdowns shall be fully coordinated with the Water Facilities Manager and Chief Operator at least 72 hours before the scheduled shutdown. Owner personnel shall operate Owner's facilities involved in the short-term and extended shutdowns.
- D. Short term shutdowns in plant flow will be allowed for tie-ins to existing facilities, installation of temporary bulkheads, etc. All such shutdowns shall be scheduled for low-flow period during the daily diurnal water demand (as determined by the Water Facilities Manager) and shall generally be limited to four hours or less depending on water demand, system pressure, weather forecast and amount of potable water stored onsite. The schedule and duration of short-term shutdowns shall be at the discretion of the Owner.
- E. Any temporary Work, facilities, roads, walks, protection of existing structures, piping, blind flanges, valves, equipment, etc. that may be required within the Contractor's Work limits to maintain continuous and dependable plant operation shall be furnished by the Contractor at no extra cost to the Owner.
- F. The Owner shall have the authority to order Work postponed, stopped or prohibited that would, in his opinion, unreasonably result in interrupting the necessary functions of the plant operations.

- G. If the Contractor impairs performance or operation of the plant as a result of not complying with specified provisions for maintaining plant operations, then the Contractor shall immediately make all repairs or replacements and do all Work necessary to restore the plant to operation to the satisfaction of the Owner and the Engineer. Such Work shall progress continuously to completion on a 24-hours per day, seven Work days per week basis.
  - H. The Contractor shall provide the services of emergency repair crews on call 24-hours per day.
  - I. The Broward County Health Department will be contacted by the Owner at least 24-hours prior to the shutdown of any process unit. Contractor shall coordinate scheduled shutdowns with the Owner.
- 1.03 GENERAL OPERATING REQUIREMENTS, CONSTRAINTS, AND CONSTRUCTION REQUIREMENTS
- A. Access to Plant Site, Roadways, and Parking Areas
    - 1. An unobstructed traffic route through the facility shall be maintained at all times for the Owner's operations personnel and maintenance equipment. Parking for personal vehicles of construction personnel may park on Owner property within the facility where designated. The Contractor shall be responsible for providing access to and for preparing and maintaining approved parking areas.
    - 2. Vehicular access to the treatment units and buildings for Owner personnel shall be maintained at all times by the Contractor.
    - 3. The Contractor shall provide temporary measures to protect the existing pavement by filling over with earthen material or supplying other measures acceptable to the Engineer. The Contractor shall repair any damage to existing paved surfaces that occurs during the construction period. Any areas disturbed along the shoulders of the access road and interior roads and elsewhere inside and outside of the plant shall be repaired, graded, seeded, etc. as necessary to match pre-existing conditions.
    - 4. The Contractor shall not undertake the restoration/construction of new roadway (paved, gravel, or asphalt overlay) shown on the Contract Drawings, until all other Work on the plant improvements has been completed.
  - B. Personnel Access: Treatment plant personnel shall have access to all areas that remain in operation throughout the construction period. The Contractor shall locate stored material, dispose of construction debris and trash, provide temporary walkways, provide temporary lighting, and other such Work as directed by the Engineer to maintain personnel access to areas in operation. Access and adequate parking areas for plant personnel must be maintained throughout construction.

- C. Plumbing Facilities: Unless otherwise allowed by the Engineer, sanitary facilities in the existing structures shall be operational at all times for plant operating personnel. All other building plumbing systems such as roof and floor drains, pumping, etc., shall be maintained for all structures.
- D. Building Heating and Ventilating: With the exception of the buildings shown on the Drawings to be renovated, heating and ventilating for the existing plant structures shall be in service for the entire construction period. Additional temporary heating and ventilation shall be provided as required to maintain facilities under construction adequately heated and vented and air conditioned. The temperatures to be maintained in any areas occupied by plant operating personnel such as offices, lunchrooms, locker rooms, bathrooms, etc., shall be 70 to 75 degrees Fahrenheit. The temperatures to be maintained in all other interior plant areas, whether new, existing or temporary, shall be maintained at 75 to 80 degrees Fahrenheit. Provide temporary HVAC system for the existing High Service Pump building switchgear room and FPL transformer room when existing roof mounted HVAC units are removed. Provide all necessary power distribution equipment, disconnect, cables, labor, etc. to install and maintain the temporary HVAC system.
- E. Power, Light and Communications Systems (General): Electric power, lighting service and communications systems shall be maintained in uninterrupted operation in all areas that remain in operation. Individual units may be disconnected as required for replacement, but service shall be available at all times including periods when plant elements are out of service. Shutdown of electrical facilities shall be limited to not more than five (5) hours. The Owner may allow longer outages under conditions determined by the Owner. The Electrical Contractor shall coordinate required shutdowns with the General Contractor to minimize the total number of shutdowns required to complete construction. Contractor shall provide temporary lighting, including cables and labor for all areas that remain in operation. Owner's phone service to the plant shall be maintained in continuous operation during construction.
- F. Draining Process Pipes and Conduits (General): The contents of all pipes and conduits to be removed, replaced or relocated (or dewatered for a specific purpose) shall be transferred to a suitable facility in a manner approved by the Owner through hoses or piping, or by using pumps if hydraulic conditions so require them. Liquid chemical piping shall be purged with potable water, flushed clean and drained. Gaseous chemical piping shall first be purged with clean dry air, nitrogen or other inert gas in accordance with appropriate OSHA, Chlorine Institute, or other chemical institute standards as may apply, then flushed with potable water and drained. The Contractor shall provide the pumps, piping and hoses at no additional cost to the Owner. No uncontrolled spillage of a pipe or conduit shall be permitted.
- G. Potable Water System: Potable water service shall be maintained in continuous service at all times during construction except for short term interruptions required for tie-ins. Shutdown of the potable water system shall be fully planned and coordinated with the Water Facilities Manager and Chief Operator and shall be limited to not more than two (2) hours. Existing fire hydrants within the plant site shall be operational at all times, unless otherwise approved by the Owner.

- H. Sump Pumps and Sumps: All existing sumps shall be maintained in an operable condition with either existing pumps or temporary pumps. Interim piping, power and controls shall be provided as required by the staged construction sequence.
- I. Seal Water and Service Water Piping: A supply of service and seal water and the necessary connections to existing equipment shall be maintained during construction. Interim piping shall be provided as required.

#### 1.04 CONSTRUCTION SEQUENCE AND OPERATIONAL CONSTRAINTS

- A. The Contractor shall plan the Work based on the following suggested outline sequence of construction.
- B. The following sequence of construction does not include all items necessary to complete the work, but is intended to identify the sequence of critical events necessary to minimize disruption to the on-going treatment plant process and to ensure compliance with regulatory requirements. Events identified below are not all inclusive and additional items of work not shown may be required.

##### 1. Work Element 1 - Construction Mobilization and Submittals

- a. Set up field offices (if applicable) and staging area, obtain permits, develop and submit construction schedule, shop drawing schedule and begin shop drawing submittals. Submit detailed construction sequence and schedule for review and acceptance. The work cannot proceed until submittal and acceptance of a detailed construction sequence and schedule.
- b. Complete connection to all temporary utility services.
- c. Scheduling Constraint: Work element 1 shall be initiated as soon as possible after the Contractor receives the Notice to Proceed.
- d. Scheduling Constraint: Mobilization shall be completed within 30 calendar days after the Contractor receives the Notice to Proceed.

##### 2. Work Element 2 – Construct Proposed Facilities



- A. At no time shall the Contractor undertake to close off any pipelines, or open valves, or take any other action that would affect the operation of the existing system, until authorization is granted by the Owner or Engineer and after proper notification.
- B. The work to be performed by the Contractor may involve additions, temporary facilities, and modifications to major operational systems within the treatment plant and other minor sub-processes. The Contractor will be required to "interface" with these active facilities and should ensure that these systems remain operational during all construction activities. Specific constraints to be placed on the work to be performed are summarized below. Note that this listing is subject to revision based on actual conditions.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

- END OF SECTION -

## SECTION 01530 - PROTECTION OF EXISTING FACILITIES

### PART 1 -- GENERAL

#### 1.01 THE REQUIREMENT

- A. The Contractor shall be responsible for the preservation and protection of property adjacent to the work site against damage or injury as a result of its operations under this Contract. Any damage or injury occurring on account of any act, omission or neglect on the part of the Contractor shall be restored in a proper and satisfactory manner or replaced by and at the expense of the Contractor to an equal or superior condition than previously existed.
- B. The Contractor shall comply promptly with such safety regulations as may be prescribed by the Owner or the local authorities having jurisdiction and shall, when so directed, properly correct any unsafe conditions created by, or unsafe practices on the part of, its employees. In the event of the Contractor's failure to comply, the Owner may take the necessary measures to correct the conditions or practices complained of, and all costs thereof will be deducted from any monies due the Contractor. Failure of the Engineer to direct the correction of unsafe conditions or practices shall not relieve the Contractor of its responsibility hereunder.
- C. In the event of any claims for damage or alleged damage to property as a result of work under this Contract, the Contractor shall be responsible for all costs in connection with the settlement of or defense against such claims. Prior to commencement of work in the vicinity of property adjacent to the work site, the Contractor, at its own expense, shall take such surveys as may be necessary to establish the existing condition of the property. Before final payment can be made, the Contractor shall furnish satisfactory evidence that all claims for damage have been legally settled or sufficient funds to cover such claims have been placed in escrow, or that an adequate bond to cover such claims has been obtained.

#### 1.02 PROTECTION OF WORK AND MATERIAL

- A. During the progress of the work and up to the date of final payment, the Contractor shall be solely responsible for the care and protection of all work and materials covered by the Contract.
- B. All work and materials shall be protected against damage, injury or loss from any cause whatsoever, and the Contractor shall make good any such damage or loss at its own expense. Protection measures shall be acceptable to the Engineer.

#### 1.03 BARRICADES, WARNING SIGNS AND LIGHTS

- A. The Contractor shall provide, erect and maintain as necessary, strong and suitable barricades, danger signs and warning lights along all roads accessible to the public, as required by the authority having jurisdiction, to insure safety to the public. All barricades and obstructions along public roads shall be illuminated at night and all lights for this purpose shall be kept burning from sunset to sunrise.

- B. Each Contractor shall provide and maintain such other warning signs and barricades in areas of and around their respective work as may be required for the safety of all those employed in the work, Owner operating personnel, or those visiting the site.

#### 1.04 EXISTING UTILITIES AND STRUCTURES

- A. The term existing utilities shall be deemed to refer to both publicly-owned and privately-owned utilities such as electric power and lighting, telephone, water, gas, storm drains, process lines, sanitary sewers and all appurtenant structures.
- B. Where existing utilities and structures are indicated on the Drawings, it shall be understood that all of the existing utilities and structures affecting the work may not be shown and that the locations of those shown are approximate only. It shall be the responsibility of the Contractor to ascertain the actual extent and exact location of existing utilities and structures. In every instance, the Contractor shall notify the proper authority having jurisdiction and obtain all necessary directions and approvals before performing any work in the vicinity of existing utilities.
- C. Prior to beginning any excavation work, the Contractor shall, through field investigations, determine any conflicts or interferences between existing utilities and new utilities to be constructed under this project. This determination shall be based on the actual locations, elevations, slopes, etc., of existing utilities as determined in the field investigations, and locations, elevation, slope, etc. of new utilities as shown on the Drawings. If interference exists, the Contractor shall bring it to the attention of the Engineer as soon as possible. If the Engineer agrees that interference exists, it shall modify the design as required.

Additional costs to the Contractor for this change shall be processed through a Change Order as detailed elsewhere in these Contract Documents. In the event the Contractor fails to bring a potential conflict or interference to the attention of the Engineer prior to beginning excavation work, any actual conflict or interference which does arise during the Project shall be corrected by the Contractor, as directed by the Engineer, at no additional expense to the Owner.

- D. The work shall be carried out in a manner to prevent disruption of existing services and to avoid damage to the existing utilities. Temporary connections shall be provided, as required, to insure uninterrupted of existing services. Any damage resulting from the work of this Contract shall be promptly repaired by the Contractor at its own expense in a manner approved by the Engineer and further subject to the requirements of any authority having jurisdiction. Where it is required by the authority having jurisdiction that they perform their own repairs or have them done by others, the Contractor shall be responsible for all costs thereof.
- E. Where excavations by the Contractor require any utility lines or appurtenant structures to be temporarily supported and otherwise protected during the construction work, such support and protection shall be provided by the Contractor. All such work shall be performed in a manner satisfactory to the Engineer and the respective authority having jurisdiction over such work. In the event the Contractor fails to provide proper support or protection to any existing utility, the Engineer may, at its discretion, have the respective authority to provide

such support or protection as may be necessary to insure the safety of such utility, and the costs of such measures shall be paid by the Contractor.

- F. Protection of existing utilities, structures and other facilities: The underground pipes, utilities and structures shown on the Plans are located according to the best information available, but may vary by several feet from both the position and elevation shown. The Contractor shall explore far enough ahead of its work to determine the exact location and condition of such utilities, structures or facilities so that, before the Work is installed, the Engineer may change the line or grade of the pipe or other facility, should that become necessary to avoid a conflict. Should this exploration reveal that adjustments to the work are necessary; the Contractor shall immediately notify the Engineer and coordinate with him to adjust the work in a timely fashion avoiding delays to construction. No request for additional compensation or Contract time (except for a non-compensable time extension at the sole discretion of the Engineer, whose decision shall be final) resulting from encountering utilities or structures not shown, or differing in location or elevation from that shown, will be considered. The Contractor shall explore sufficiently ahead of the Work to allow time for any necessary adjustment without delay occasioned by encountering underground utilities or structures which could have or should have been discovered by timely exploration ahead of the Work shall rest solely with the Contractor.
- G. Relocation of existing utilities: The relocation of existing utilities, as noted on the Plans, or for the convenience of the Contractor shall be the responsibility of the Contractor. This work shall be completed by either the forces of the existing utility or the Contractor's forces at the discretion of the responsible utility. If the work is to be performed by the Contractor, all work shall be done in accordance with the utility company's requirements. Under no circumstances shall the Contractor be authorized extra payment for this work, and all cost for the relocation shall be the responsibility of the Contractor.
- H. Any conflicts between the field investigation and the information shown on the Plans shall be brought to the immediate attention of the Engineer

#### 1.05 TREES WITHIN PROJECT LIMITS

- A. General: The Contractor shall exercise all necessary precautions so as not to damage or destroy any trees on the project site, and shall not trim or remove any trees unless such trees have been approved for trimming or removal by the jurisdictional agency or Owner. All existing trees which are damaged during construction shall be replaced by the Contractor or a certified tree company to the satisfaction of the Owner.
- B. Replacement: The Contractor shall immediately notify the Owner if any tree is damaged by the Contractor's operations. If, in the opinion of the Owner, the damage is such that replacement is necessary, the Contractor shall replace the tree at its own expense. The tree shall be of a like size and variety as the tree damaged, or, if of a smaller size, the Contractor shall pay to the Owner compensatory payment acceptable to the Owner.

#### 1.06 NOTIFICATION BY THE Contractor

- A. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric

power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way the Contractor shall notify the respective authorities representing the owners or agencies responsible for such facilities not less than three days nor more than seven days prior to excavation so that a representative

#### 1.07 DETOURS

- A. Where authority having jurisdiction requires that traffic be maintained over construction work in a public street, road, or highway, and traffic cannot be maintained on original roadbed or pavement, construct and maintain detour around the Work. Coordinate traffic routing with that of others working in same or adjacent areas.

#### 1.08 RESTORATION OF PAVEMENT

- A. General: All paved areas including asphaltic concrete berms cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents. All pavements which are subject to partial removal shall be neatly saw cut in straight lines.
- B. Temporary Resurfacing: Wherever required by the public authorities having jurisdiction, the Contractor shall place temporary surfacing, signage, striping and/or other traffic controls as required, promptly after backfilling and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of improvements.
- C. Permanent Resurfacing: In order to obtain a satisfactory junction with adjacent surfaces, the Contractor shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement.

#### PART 2 – PRODUCTS (NOT USED)

#### PART 3 – EXECUTION (NOT USED)

- END OF SECTION -

## SECTION 01600 - MATERIALS AND EQUIPMENT

### PART 1 -- GENERAL

#### 1.01 THE REQUIREMENT

- A. The Contractor shall furnish, install, test, and place in acceptable operation all material and equipment and all necessary accessories as specified herein, as shown on the Drawings, and as required for a complete and operable system.
- B. The equipment shall be provided complete with all accessories, special tools, spare parts, mountings, and other appurtenances as specified, and as may be required for a complete and operating installation.
- C. It is the intent of these Specifications that the Contractor shall provide the Owner complete and operational equipment/systems. To this end, it is the responsibility of the Contractor to provide necessary ancillary items such as controls, wiring, etc., to make each piece of equipment operational as intended by the Specifications.
- D. Furnish and Install
  - 1. Where the words "furnish", "provide", "supply", "replace", or "install" are used, whether singularly or in combination, they shall mean to furnish and install, unless specifically stated otherwise.
  - 2. In the interest of brevity, the explicit direction "to furnish and install" has sometimes been omitted in specifying materials and/or equipment herein. Unless specifically noted otherwise, it shall be understood that all equipment and/or materials specified or shown on the Drawings shall be furnished and installed under the Contract as designated on the Drawings.

#### 1.02 JOB SITE DELIVERY TIMING

- A. Equipment and materials to be incorporated into the work shall be delivered sufficiently in advance of their installation and use to prevent delay in the execution of the work, and they shall be delivered as nearly as feasible in the order required for executing the work.
- B. The Contractor shall not deliver to the job site equipment and materials that are not scheduled to be incorporated into the work within the following 120 calendar days.

#### 1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. All equipment, materials, and installations shall conform to the requirements of the most recent editions with latest revisions, supplements, and amendments of the specifications, codes, and standards listed in Section 01090, Reference Standards.

#### 1.04 SHOP DRAWINGS

- A. Shop Drawings, descriptive data, dimensions, parts, performance characteristics, material Specifications, construction details, piping and wiring diagrams, and associated items, as appropriate, showing conformance of all equipment to the Contract Documents, shall be submitted to the Engineer for review in accordance with Section 01300, Submittals. Additional required information shall include: the horsepower, voltage, and rotative speed of the motor along with other pertinent motor data, and the total weight of the equipment plus the approximate weight of the shipped materials. Shop Drawings shall also include complete erection, installation, and adjustment instructions, and recommendations.

#### 1.05 COORDINATION

- A. The Contractor shall coordinate all details, locations, field measurements and other conditions with various equipment suppliers, so that the equipment supplied functions as part of a complete system.

#### 1.06 SERVICES OF THE MANUFACTURER'S REPRESENTATIVE

Refer to Division No.9 of the Specifications.

#### 1.07 SUBSTITUTIONS

- A. Requests for substitutions of equipment or materials shall conform to the requirements of the General Conditions, Supplemental Conditions, and as hereinafter specified.
  - 1. Contractor shall submit for each proposed substitution sufficient details, complete descriptive literature and performance data together with samples of the materials, where feasible, to enable the Owner and Engineer to determine if the proposed substitution is equal.
  - 2. Contractor shall submit certified tests, where applicable, by an independent laboratory attesting that the proposed substitution is equal.
  - 3. A list of installations where the proposed substitution is equal.
  - 4. Requests for substitutions shall include full information concerning differences in cost, and any savings in cost resulting from such substitutions shall be passed on to the Owner.
- B. Where the approval of a substitution requires revision or redesign of any part of the work, including that of other Contracts, all such revision and redesign, and all new drawings and details therefore, shall be provided by the Contractor at his own cost and expense, and shall be subject to the approval of the Owner and Engineer.
- C. In the event that the Engineer is required to provide additional engineering services, then the Engineer's charges for such additional services shall be charged to the Contractor by the Owner in accordance with the requirements of the General Conditions, and the Supplemental Conditions.

- D. In all cases the Owner and Engineer shall be the judge as to whether a proposed substitution is to be approved. The Contractor shall abide by their decision when proposed substitute items are judged to be unacceptable and shall in such instances furnish the item specified or indicated. No substitute items shall be used in the work without written approval of the Owner and Engineer.
- E. Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Engineer in considering a substitution proposed by the Contractor or by reason of the failure of the Engineer to approve a substitution proposed by the Contractor.
- F. Acceptance of any proposed substitution shall in no way release the Contractor from any of the provisions of the Contract Documents.

## PART 2 -- PRODUCTS

### 2.01 GENERAL

- A. All parts of the equipment furnished shall be amply designed and constructed for the maximum stresses occurring during fabrication, erection, and continuous operation.
- B. All materials shall be new and both workmanship and materials shall be of the very best quality, entirely suitable for the service to which the unit is to be subjected and shall conform to all applicable sections of these Specifications.
- C. All parts of duplicate equipment shall be interchangeable without modification. Manufacturer's design shall accommodate all the requirements of these Specifications.
- D. All bearings and moving parts shall be adequately protected by bushings or other approved means against wear, and provision shall be made for adequate lubrication by readily accessible devices.
- E. All equipment or component of equipment (e.g., motors) greater than 100 pounds shall have lifting lugs, eyebolts, etc., for ease of lifting, without damage or undue stress exerted on its components.
- F. Provide manufacturer's standard materials suitable for service conditions, unless otherwise specified in the individual Specifications.
- G. 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.
- H. 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 replacement, manufacturer's



services, and implement same or similar process instrumentation and control functions in same or similar manner.

- I. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.
- J. Provide interchangeable components of the same manufacturer, for similar components, unless otherwise specified.
- K. Equipment, Components, Systems, 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.
- L. Regulatory Requirement: Coating materials shall meet federal, state, and local requirements limiting the emission of volatile organic compounds and for worker exposure.
- M. Safety Guards: All rotating shafts, couplings, or other moving pieces of equipment shall be provided with suitable protective guards of sheet metal or wire mesh, neatly and rigidly supported. Guards shall be removable as required to provide access for repairs.
- N. Provide materials and equipment listed by UL wherever standards have been established by that agency.

### PART 3 -- EXECUTION

#### 3.01 DELIVERY, UNLOADING AND INSPECTION

- A. The Contractor shall not deliver to the job site equipment and materials that are not scheduled to be incorporated into the work within the following 120 calendar days.
- B. 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.
- C. 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. Include UL labels on products so specified.
- D. Unload products in accordance with manufacturer's instructions for unloading or as specified. Record receipt of products at site. Inspect for completeness and evidence of damage during shipment.
- E. 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. Delays to the Work resulting from material or equipment damage that necessitates procurement of new products will be considered delays within Contractor's control.
- F. Notify Engineer upon arrival of major equipment and materials.

### 3.02 HANDLING, STORAGE AND PROTECTION

- A. Contractor shall store his equipment and materials at the job site in accordance with the requirements of the General Conditions, the Supplemental Conditions, and as hereinafter specified.
- A. All equipment and materials shall be stored in accordance with manufacturer's recommendations and as directed by the Owner or Engineer, and in conformity to applicable statutes, ordinances, regulations and rulings of the public authority having jurisdiction and in manner to prevent damage.
- B. Equipment and materials stored in the job site, or offsite in a bonded warehouse, is stored at the Contractor's risk. Any equipment or materials of whatever kind, which may have become damaged or deteriorated from any cause, shall be removed and replaced by items that are satisfactory to the Engineer at no expense to the Owner.
- C. Arrange storage in a manner to provide easy access for inspection and manufacturer's recommended maintenance. Make periodic inspections of stored products to assure 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 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.
- E. Contractor shall not store equipment and materials or encroach upon private property without the written consent of the owners of such private property.
- F. Contractor shall not store unnecessary materials or equipment on the job site.
- G. Contractor shall take care to prevent any structure from being loaded with a weight which will endanger its security or the safety of persons.
- H. Materials shall not be placed within ten (10) feet of fire hydrants. Gutters, drainage channels and inlets shall be kept unobstructed at all times.
- I. Contractor shall provide adequate temporary storage buildings/facilities, if required, to protect materials or equipment on the job site.

### 3.03 INSTALLATION

- A. The Contractor shall obtain written installation manuals from the equipment manufacturer prior to installation. Equipment shall be installed strictly in accordance with recommendations of the manufacturer. The Contractor shall retain a copy of the manufacturer's installation manuals on site, stored in the Contractor's field office and available for review at all times.

- B. The Contractor shall have on hand sufficient personnel, proper construction equipment, and machinery of ample capacity to facilitate the work and to handle all emergencies normally encountered in work of this character. To minimize field erection problems, mechanical units shall be factory-assembled insofar as practical.
- C. Equipment shall be erected in a neat and workmanlike manner on the foundations at the locations and elevations shown on the Drawings.
- D. All blocking and wedging required for the proper support and leveling of equipment during installation shall be furnished by the Contractor. All temporary supports shall be removed, except steel wedges and shims, which may be left in place with the approval of the Engineer.

- END OF SECTION -

## SECTION 01700 - PROJECT CLOSEOUT

### PART 1 -- GENERAL

#### 1.01 THE REQUIREMENT

##### A. Final Cleaning

1. At the completion of the work, the Contractor shall remove all rubbish from and about the site of the work, and all temporary structures, construction signs, tools, scaffolding, materials, supplies and equipment which he or any of his Subcontractors may have used in the performance of the work. Contractor shall broom clean paved surfaces and rake clean other surfaces of grounds.
2. Contractor shall thoroughly clean all materials, equipment and structures; all marred surfaces shall be touched up to match adjacent surfaces; dirty filters and burned out lights replaced as required; all glass surfaces cleaned and floors cleaned and polished so as to leave work in a clean and new appearing condition.
3. Contractor shall maintain cleaning until project, or portion thereof, is occupied by the Owner.

##### B. Final Cleanup; Site Rehabilitation

1. Before finally leaving the site, the Contractor shall wash and clean all exposed surfaces which have become soiled or marked, and shall remove from the site of work all accumulated debris and surplus materials of any kind which result from his operation, including construction equipment, tools, sheds, sanitary enclosures, etc. The Contractor shall leave all equipment, fixtures, and work, which he has installed, in a clean condition. The completed project shall be turned over to the Owner in a neat and orderly condition.
2. The site of the work shall be rehabilitated or developed in accordance with other sections of the Specifications and the Drawings. In the absence of any portion of these requirements, the Contractor shall completely rehabilitate the site to a condition and appearance equal or superior to that which existed just prior to construction, except for those items whose permanent removal or relocation was required in the Contract Documents or ordered by the Owner.

##### C. Final Inspection

1. Final cleaning and repairing shall be so arranged as to be finished upon completion of the construction work. The Contractor will make his final cleaning and repairing, and any portion of the work finally inspected and accepted by the Engineer shall be kept clean by the Contractor, until the final acceptance of the entire work.

2. When the Contractor has finally cleaned and repaired the whole or any portion of the work, he shall notify the Engineer that he is ready for final inspection of the whole or a portion of the work, and the Engineer will thereupon inspect the work. If the work is not found satisfactory, the Engineer will order further cleaning, repairs, or replacement.
3. When such further cleaning or repairing is completed, the Engineer, upon further notice, will again inspect the work. The "Final Payment" will not be processed until the Contractor has complied with the requirements set forth, and the Engineer has made his final inspection of the entire work and is satisfied that the entire work is properly and satisfactorily constructed in accordance with the requirements of the Contract Documents.

#### D. Project Close Out

1. As construction of the project enters the final stages of completion, the Contractor shall, in concert with accomplishing the requirements set forth in the Contract Documents, attend to or have already completed the following items as they apply to his contract:
  - a. Correcting or replacing defective work, including completion of items previously overlooked or work which remains incomplete, all as evidenced by the Engineer's "Punch" Lists.
  - b. Attend to any other items listed herein or brought to the Contractor's attention by the Engineer.
2. Just before the Engineer's Certificate of Substantial Completion is issued, the Contractor shall accomplish the cleaning and final adjustment of the various building components as specified in the Specifications and as follows:
  - a. Touch up marks or defects in painted surfaces and touch up any similar defects in factory finished surfaces.
  - b. Cleanup "over spray" and other paint mishaps.
3. In addition, and before the Certificate of Substantial Completion is issued, the Contractor shall submit to the Engineer (or to the Owner if indicated) certain records, certifications, etc., which are specified elsewhere in the Contract Documents. A partial list of such items appears below, but it shall be the Contractor's responsibility to submit any other items which are required in the Contract Documents:
  - a. Certification of materials in compliance with Contract Documents.
  - b. Any special guarantees or bonds (Submit to Owner).

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

- END OF SECTION -

## SECTION 09210 – STUCCO

### PART 1 GENERAL

#### 1.01 SCOPE OF WORK

- A. The Contractor shall furnish and install stucco repair system on the exterior of masonry and concrete wall surfaces including exterior finish concrete columns and beams as shown on the Plans and specified herein.
- B. Stucco will be the final architectural treatment prior to painting and therefore it shall provide a decorative, durable, consistent, and even finish with no imperfections of the substrate telegraphed through the stucco.

#### 1.02 RELATED WORK

- A. Except as modified by governing local codes and by this Specification, conform to provisions and recommendations of the following standards for materials and application:
  - 1. ANSI 42.2, Portland Cement Plastering and Stucco
  - 2. Portland Cement Plaster (Stucco) Manual
  - 3. ASTM C 926

#### 1.03 SUBMITTALS

- A. Manufacturer's Data: Submit three copies of manufacturer's specifications and installation instructions for each material required, including other data as may be required to show compliance with these specifications.
- B. Sample: For final review of each texture, complete one wall area on job site five working days minimum before proceeding with the work.
- C. Applicator shall show proof of specializing in lath and plaster work for a minimum of five years.

#### 1.04 DELIVERY, STORAGE AND HANDLING

- A. Source of Supply: Do not change brands or source of supply for materials during course of work.
- B. Protection: Deliver materials except for sand and water in manufacturer's unopened containers fully identified with name, brand, type and grade. Protect stucco materials from contamination and dampness until used. Store in a dry ventilated space off the ground. Protect lime putty from sun exposure and prevent excessive evaporation when stored.

## PART 2 PRODUCTS

### 2.01 PRODUCTS

- A. Aggregates: Sand meets the requirements of ASTM C 897.
- B. Fiber Reinforcement: Fiber reinforcement shall be fiberglass "Fibermesh", or equal, ½-inch long, free from grease, oil, dirt, and other impurities. Separate before use.
- C. Metal Lath: Shall be galvanized steel diamond mesh.
- D. Corner beads, reveals, control joints, stucco stops, and other exterior accessories shall be PVC material conforming to the newest editions of ASTM D1784 and C1063. Corner beads shall be provided with 2 ½" x 2 ½" legs.
- E. Cement: Masonry cement conforming to ASTM C91-Type.
- F. Lime: Shall be hydrated, ASTM C 207, Type S.
- G. Bonding Agent: Shall be Lanco CB-1000 or equal.

### 2.02 MIXES

- A. General
  - 1. All mixes are by volume unless otherwise specified. All mix proportions are suggestive only; variations to meet local conditions and achieve desired finish are permitted within limits specified in ASTM C926.
  - 2. Water shall be potable and free from deleterious materials which would impair the work and from a source approved by Engineer.
- B. Stucco
  - 1. Premix by Titan or equal
  - 2. 1 part Masonry Cement
  - 3. Bonding Agent
  - 4. 2½ to 4 parts aggregate
  - 5. 1 lb. fiber per sack of cement\*

\*Brown and scratch coats shall be installed with fiber.

## PART 3 EXECUTION

### 3.01 EXAMINATION OF SUBSTRATES

- A. Examine substrates and the conditions under which the stucco work is to be installed. Do not proceed until unsatisfactory conditions detrimental to the proper and timely completion of the work have been corrected.

- B. The surface to receive the stucco repair system shall be structurally sound, clean, dry and free of residual moisture or damage from moisture. Surfaces shall be properly cured and free of dirt, dust, oil, grease, mildew, fungus, laitance, efflorescence and any other contaminant. Any surfaces not in compliance shall be corrected prior to installation of the stucco repair system:
  - 1. Surface contaminants, paint and debris must be removed by minimum 5,000 psi water blasting or other appropriate means acceptable to the Engineer.
  - 2. If patching, filling or leveling of irregularities is required, repair with appropriate leveling material to thickness required to achieve a smooth, plumb surface.
- C. Apply bonding agent to all concrete and masonry surfaces prior to installing new stucco. Bonding agent shall be cured per the manufacturer's recommendation prior to applying stucco, and if the curing timeframe was exceeded, bonding agent will have to be reapplied.

### 3.02 INSTALLATION

- A. General: Apply 3-coat work consisting of ¼-inch scratch coat, ¼-inch brown coat and 1/8-inch finish coat for total of 5/8-inch. Apply finish coat with a reasonably uniform thickness over entire surface, with vertical surfaces flat, straight, and plumb. Make interior angles square, and make corners square but slightly rounded. Where casing beads do not occur at the juncture of stucco and hollow metal frames, cut a groove in the base coat and later in the finish coat to minimize the appearance of cracks at these joints.
- B. The Engineer will field locate damaged stucco areas by visual inspections and/or by knocking on the outer stucco surface for a sound test. Damaged areas will be marked for repairs.
- C. Stucco Repair of Wall Sections:
  - 1. Properly prepare stucco surfaces by cutting and removing cracked and loose stucco. Saw cut existing stucco at an angle of approximately 45 degrees with the surface before installing new stucco. Prepare the substrate as per Section 3.01.
  - 2. Apply stucco by trowel to a maximum 1/4 inch thickness in one application. Apply second coat and third coat, if necessary, to achieve a smooth, plumb surface and flush with adjoining surfaces. Damp cure the first coat for 48 hours, then apply the second coat. Damp cure by lightly fogging the installed area for at least 48 hours after initial set (usually within the first 1 to 4 hours after installation). Allow to dry prior to application of primer or finish.
  - 3. Replace damaged corner beads, stucco stops, reveals and lath mesh.
- D. Crack Repair:



1. Cracks that are larger than 1/8 inch wide shall be repaired by cutting a v-shaped groove on the exterior wall surface along the crack length and filling the groove with an epoxy based grout prior to re-coating.
  2. If cracks are widespread throughout the wall area, remove the cracked stucco section and repair as described in Section 3.02-B-1.
  3. Water bearing structures that have cracked concrete shall be injected with crack injection epoxy to prevent leaks.
- E. Mixing: Use mechanical mixers for mixing stucco; small batches may be hand mixed. Do not use caked or lumped material. Clean mechanical mixers, mixing boxes, and tools after mixing each batch; keep free of stucco from previous mixes. Thoroughly mix stucco with proper amount of water until uniform in color and consistency. Tempering of stucco will not be permitted; discard stucco which has begun to stiffen. Provide waterproof protection under mixer.
- F. Application
1. Apply corner lath and/or strip lath at all junctures of dissimilar substrate materials (masonry-concrete) before proceeding with base coat of stucco work.
  2. Application shall be by hand. Limit machine application to base coats, except where machine texture finish is specified.

### 3.03. FIELD QUALITY CONTROL

- A. Patching
1. Work containing cracks, blisters, pits, checks, or discoloration will not be accepted. Remove such work including rejected work, and replace with new. Patching of defective work permitted only after notification of Engineer.
  2. Perform cutting, patching, repairing, and pointing-up operations neatly and thoroughly. Repair the cracks and indented surfaces by moistening the stucco and filling with new material, trowled or tamped flush with adjoining surfaces. Point-up and finish surfaces around fixtures, outlet boxes, piping, fittings, tile, and other work flush with adjacent stucco. Where new stucco adjoins stucco which has been installed more than 48 hours, cut existing stucco at an angle of approximately 45 degrees with the surface before installing new stucco.

### 3.04 CLEANING AND PROTECTION

- A. Make provisions to minimize spattering of stucco on other work. Promptly clean windows and other surfaces which have been soiled.

- B. Protect stucco from the weather, premature drying, dirt, dust, marring, or other damage throughout the construction period so it will be without any indication of damage at time of acceptance.

- END OF SECTION -

## SECTION 09900 - PAINTING

### PART 1 -- GENERAL

#### 1.01 SCOPE

- A. Contractor shall furnish all labor, tools, materials, supervision and equipment necessary to do all the work specified herein and as required for a complete installation, including surface preparation, priming and painting of existing and Contractor furnished equipment, materials and structures.
- B. Contractor shall field measure all quantities; pre-bid site visits are mandatory. Owner and Engineer are not responsible for ensuring accuracy of the dimensions shown on the Drawings.
- C. It is the intent to coat all existing exterior concrete / masonry, existing exterior steel surfaces and other exterior surfaces as identified in Drawing A-01.

#### 1.02 RELATED WORK

- A. All paint for concrete and metal surfaces shall be especially adapted for use around water treatment plants and shall be applied in conformance with the manufacturer's published specifications.
- B. Contractor shall remove old existing caulking material and install new caulking material at all louvers, doors and windows using Sikaflex Constructions Sealant product or equal.

#### 1.03 QUALIFICATIONS

- A. Contractor shall have minimum five years experience in industrial painting.
- B. Contractor shall submit with his Bid a list of water/wastewater treatment plant work they have completed in the last five years and or related work. Included shall be names, addresses, contacts and phone numbers.

#### 1.04 GENERAL INFORMATION AND DESCRIPTION

- A. All paint shall be applied in conformance with the manufacturer's published specifications.
- B. The terms "coating" and "paint", as used interchangeably herein, includes alkyds, acrylics, emulsions, enamels, epoxies, paints, polyurethanes, flourourethanes, zinc rich primers and other products, whether used as prime, intermediate, or finish coats.
- C. Dry Film Thickness (DFT) refers to paint thickness, measured in mils (1/1000 inch), of a coat of paint in its cured state.

- D. All buildings, facilities, structures, and appurtenances, as indicated on the Drawings and as specified herein, shall be painted with not less than one shop coat and field coat(s), or one prime coat and finish coat(s) of the appropriate paint. Items to be painted include, but are not limited to exterior concrete, masonry, stucco, structural steel, miscellaneous metals, operators, pipe-fittings, valves, mechanical equipment, motors, conduit, and all other work which is obviously required to be painted unless otherwise specified.
- E. Baked-on enamel finishes and items with standard shop finishes such as graphic panels, electrical equipment, instrumentation, etc., shall not be field painted unless required. Aluminum, stainless steel, fiberglass and bronze work shall not be painted unless color coding and marking is required or otherwise specified. A list of surfaces not to be coated is included in Article 1.13.
- F. Contractor shall obtain all permits, licenses and inspections and shall comply with all laws, codes, ordinances, rules and regulations promulgated by authorities having jurisdiction which may bear on the work. This compliance will include Federal Public Law 91-596 more commonly known as the "Occupational Safety and Health Act of 1970".
- G. Contractor shall be responsible for any damage to any surrounding structures such as buildings, cars, landscaping, sidewalks, fences, etc. as a result of paint splatter, blast abrasive, mechanical damage, etc. All damage shall be repaired and restored to the original condition.

#### 1.05 REFERENCES

- A. Standards, Specifications, Recommended Practices, and listed herein are part of this Section to extent referenced
  - 1. American Society for Testing and Materials:
    - a. ASTM D 16 Terminology Relating to Paint, Varnish, Lacquer, and Related Products
    - b. ASTM D 523 Test Method for Specular Gloss
    - c. ASTM D 610 Standard Practice For Evaluating Degree of Rusting on Painted Steel Surfaces
    - d. ASTM D 2244 Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates
    - e. ASTM D 3359 Test Method for Measuring Adhesion by Tape Test
    - f. ASTM D 4414 Standard Practice for Measurement of Wet Film Thickness by Notch Gages

- g. ASTM D 4541 Test Method for Pull Off Strength of Coatings Using Portable Adhesion-Testers
  - h. ASTM D 1005 Test for determining dry film thickness
  - i. ASTM D 4285 Standard Test Method for Indicating Oil or Water in Compressed Air
  - j. ASTM D 4417 Test for determining surface profile
  - k. ASTM D 6677 Standard Test Method for Evaluating Adhesion by Knife
2. The Society for Protective Coatings:
- a. SSPC-SP-1 Specification for Solvent Cleaning
  - b. SSPC-SP-2 Specification for Hand Tool Cleaning
  - c. SSPC-SP-3 Specification for Power Tool Cleaning
  - d. SSPC-SP-5 Specification for White Metal Blast Cleaning
  - e. SSPC-SP-6 Specification for Commercial Blast Cleaning
  - f. SSPC-SP-7 Specification for Brush-Off Blast Cleaning
  - g. SSPC-SP-10 Specification for Near White Metal Blast Cleaning
  - h. SSPC-SP-11 Specification for Power Tool Cleaning to Bare Metal
  - i. SSPC-SP-12 Specification for Water Jetting
  - j. SSPC-SP-13 Surface Preparation of Concrete
  - k. SSPC-SP-14 Industrial Blast Cleaning
  - l. SSPC-SP-15 Power Tool Cleaning to Commercial Metal
  - m. SSPC-PA-1 Painting Application Specification
  - n. SSPC-PA-2 Measurement of Dry Paint Thickness with Magnetic Gages
  - o. SSPC-QP-1 Certification of Field Application to Complex Industrial and Marine Structures.
  - p. SSPC-QP-2 Certification of Field Removal of Hazardous Coatings.
  - q. SSPC-TU-11 Inspection of Fluorescent Coating Systems

- r. SSPC-VIS-1 Visual Standard for Abrasive Blast Cleaned Steel
- s. SSPC-VIS-2 Standard Method for Evaluating Degree of Rusting on Painted Steel Surfaces

#### 1.06 MANUFACTURERS

- B. All painting materials shall be as manufactured by Carboline, Sherwin Williams, Tnemec, International Paint, or equal.

#### 1.07 SUBMITTALS

- A. Contractor shall prepare a complete schedule of surfaces to be coated and shall identify the surface preparation and paint system he proposes to use. The coating schedule shall be in conformance with Article 3.07. The schedule shall contain the name of the paint manufacturer, and the name, address and telephone number of the manufacturer's representative that will inspect the work. The schedule shall be submitted to Engineer for review as soon as possible following the Notice to Proceed so that the schedule may be used to identify colors and to specify shop painting systems on order for fabricated equipment.
- B. Contractor shall submit a sample copy of the warranty to be issued after completion of the work.
- C. Contractor shall submit paint manufacturer's data sheets and samples of each finish and color to Engineer for review, before any work is started in accordance with the section entitled "Submittals". Manufacturer's data sheets shall include descriptive data, curing times, mixing, thinning, application requirements and installation procedures, which will be used in the evaluation for accepting or rejecting intended installation procedures.
- D. The manufacturers' published instructions for use as a guide in specifying and applying the manufacturers' proposed paint shall be submitted to Engineer. The instructions must have been written and published by the manufacturer for the purpose and with the intent of giving complete instruction for the use and application of the proposed paint in the locality and for the conditions for which the paint is specified or shown to be applied under this Contract.
- E. All limitations, precautions, and requirements that may adversely affect the paint; that may cause unsatisfactory results after the painting application; or that may cause the paint not to serve the purpose for which it was intended, that is, to protect the covered material from corrosion, shall be clearly and completely stated in the instructions. These limitations and requirements shall, if they exist, include, but not be limited to the following list:
  - 1. Storage Requirements
  - 2. Methods of application

3. Number of coats
  4. Thickness of each coat
  5. Total thickness
  6. Drying time of each coat, including primer
  7. Primer required to be used
  8. Primers not permitted
  9. Use of a primer
  10. Thinner and use of thinner
  11. Temperature and relative humidity limitations during application and after application
  12. Time allowed between coats
  13. Protection from sun
  14. Physical properties of paint including solids content and ingredient analysis
  15. Surface preparation
  16. Touch up requirements and limitations
- F. Submitted samples of each finish and color shall be prepared so that areas of each sample indicate the appearance of the various coats. For example, where a three coat system is specified, the sample shall be divided into three areas indicating one coat only, two coats and all three coats. Engineer will provide written authorization constituting a standard, as to color and finish only, for each coating system.
- G. Submit manufacturer's certification that products to be used comply with specified requirements and are merchantable and suitable for intended application.
- H. Submit listing of not less than five of applicator's most recent applications representing similar scope and complexity to the project requirements. List shall include information as follows:
1. Project name and address
  2. Name of Owner
  3. Name of Contractor
  4. Name of Engineer

5. Date of completion

- I. Contractor shall provide the name and chemical composition, product data sheets, and MSDS sheets of cleaners that will be used for preparing the existing coating or for the removal of mildew.

1.08 SERVICES OF MANUFACTURERS REPRESENTATIVE

- A. Contractor shall purchase paint from an acceptable manufacturer. The manufacturer shall assign a representative to inspect the application of his product in the field. Prior to and after coating application, the manufacturer's representative shall submit reports to Engineer identifying the products used and verifying that said products were proper for the exposure and service intended and were properly applied, respectively.
- B. Services shall also include, but not be limited to, inspecting prior coatings of paint, determination of best means of surface preparation, inspection of completed work, and final inspection of painted work to be performed eleven months after the job is completed.

1.09 WARRANTY

- A. All work covered in these specifications shall be guaranteed for a period of one year. Contractor shall provide materials and labor necessary to repair any system failures during the warranty period.
- C. After Substantial Completion of the project, Owner will perform an inspection at one year (during the twelfth month following Substantial Completion). Owner will notify Contractor when this inspection is scheduled. The Contractor shall provide a representative to attend the inspection and provide the necessary safety equipment to perform the inspection.
- D. Contractor shall extend the terms of this warranty to cover repaired parts and all replacement parts furnished under the warranty provisions for a period of one year from the date of their installation.
- E. If within ten days after Owner gives Contractor notice of a defect, failure, or abnormality of the work, Contractor neglects to make, or undertake with due diligence to make, the necessary repairs or adjustments, Owner is hereby authorized to make the repairs or adjustments or order the work to be done by a third party. The cost of the work shall be paid by Contractor.
- F. Exposure to sunlight and normal atmospheric conditions characteristic of the Fort Lauderdale, Florida area shall not void the provisions of this warranty.

1.10 QUALITY ASSURANCE

- A. General: Applicator shall be trained in application techniques and procedures of coating materials and shall demonstrate a minimum of five years successful experience



in such application. Applicator shall maintain, throughout duration of application, a crew of painters who are fully qualified.

- B. Single source responsibility shall be provided. Materials shall be products of a single manufacturer. Other, additional materials, which are produced or are specifically recommended by coating system manufacturer to ensure compatibility of system, may be used
- C. Contractor shall give Engineer a minimum of three days advance notice of the start of any field surface preparation work of coating application work.
- D. All work shall be performed only in the presence of Engineer, unless Engineer has specifically allowed the performance of such work in his absence.
- E. Inspection by Engineer, or the waiver of inspection of any particular portion of the work, shall not relieve Contractor of his responsibility to perform the work in accordance with these Specifications.
- F. Where protective coatings are to be performed by a subContractor, said subContractor must provide five references which show that the painting subContractor has previous successful experience with the specified or comparable coating systems. Include the name, address, and the telephone number for the Owner of each installation for which the painting subContractor provided the protective coating.
- G. The finish coat used shall be the same color and gloss throughout the duration of the Project.
- H. Environmental Requirements: Apply coating materials per manufacturer's printed data sheet instructions:
  - 1. Refer to specific product data sheets for minimum surface temperature requirements. Surface temperatures shall be at least 5 degrees F (15 degrees C) above dew point and rising.
  - 2. Provide for proper ventilation and/or dehumidification using explosion proof equipment and allow operation during application and cure cycle of the coating systems as recommended by manufacturer.
  - 3. Provide adequate illumination using explosion proof lights and equipment.
  - 4. Provide work site free of airborne dust, debris, and other contaminants.

#### 1.11 QUALITY WORKMANSHIP

- A. Contractor shall be responsible for the cleanliness of his painting operations and shall use covers and masking tape to protect the work whenever such covering is necessary, or if so requested by Owner. Any unwanted paint shall be carefully removed without damage to any finished paint or surface. If damage does occur, the entire surface,

adjacent to and including the damaged area, shall be repainted without visible lapmarks and without additional cost to Owner.

- B. Contractor shall be responsible for any dust, debris and/or paint droplets which leave the City's property and/or cause damage to neighboring property. Insufficient containment of abrasive debris and/or generation of nuisance dust beyond the City property limits is just cause for shut-down of the job until proper protective measures are in place and violations have been remedied.

#### 1.12 SAFETY AND HEALTH REQUIREMENTS

- A. Contractor is responsible for the safety of the work and the job site. Contractor shall provide and position all safety equipment, rigging, lighting, scaffolding, labor and calibrated instruments.
- B. In accordance with requirements of OSHA Safety and Health Regulations for General Industry (29 CFR 1910) and for Construction (29 CFR 1926), and the applicable requirements of regulatory agencies having jurisdiction, as well as manufacturer's printed instructions, appropriate technical bulletins, manuals, and material safety data sheets, Contractor shall provide and require use of personnel protective and safety equipment for persons working in or about the project site.
- C. Adequate ventilation shall be provided and maintained during surface preparation, coating mixing, coating application, and curing phases of work to adequately remove dust and fumes to prevent injury to workmen or accumulation of volatile gases. Respirators shall be worn by persons engaged or assisting in spray painting. Contractor shall provide ventilating equipment and all necessary safety equipment for the protection of the workmen and the work.
- D. Contractor shall provide and maintain safe, secure rigging and scaffolding in compliance with the OSHA scaffold standards 29 CFR 1926.450-454. Contractor is responsible for all attachments to or imposing loads on the structures. Any attachments to the structure are prohibited unless acceptable to Owner in advance. If Owner allows attachments, they shall be responsibility of Contractor.
- E. Fall protection or prevention shall be provided in accordance with 29 CFR 1926.104, 29 CFR 1926.105, and 29 CFR 1926.500-503.
- F. All paint shall comply with all requirements of the Air Pollution Regulatory Acts concerning the application and formulation of paints and coatings for an area in which the paints are applied. Specifically, paints shall be reformulated as required to meet the local, State and Federal requirements.
- G. Coatings used in conjunction with potable water supply systems shall have NSF approval for use with potable water and shall not impart a taste or odor to the water.
- H. All rigging shall meet OSHA requirements, conform to industry standards and shall be operated in a safe manner. Contractor is responsible for the integrity of rigging connections. All rods and other tank appurtenances that will be used for rigging

purposes shall be carefully checked for structural integrity before they are used for climbing or rigging. Deficiencies shall be reported and corrected before use.

#### 1.13 SURFACES NOT TO BE COATED

- A. The following list of items shall not be coated unless otherwise noted herein or on the Drawings.
  - 1. Encased piping or conduit
  - 2. Stainless steel work.
  - 3. Clear PVC secondary containment piping
  - 4. Galvanized checkered plate (Unless was previously coated)
  - 5. Aluminum handrails, grating and checkered plate (Unless was previously coated)
  - 6. Flexible couplings, lubricated bearing surfaces and insulation.
  - 7. Packing glands and other adjustable parts of mechanical equipment.
  - 8. Finish Hardware.
  - 9. Steel enchased in concrete or masonry.
  - 10. Plastic switch plates and receptacle plates.
  - 11. Signs, nameplates, serial numbers, and operating instruction labels.
  - 12. Any code-requiring labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name or nomenclature plates.
  - 13. Any moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sensing devices, motor and fan shafts, unless otherwise indicated.

#### 1.14 PROTECTION OF STRUCTURES

- A. Contractor shall use extreme diligence to assure that adjacent vehicles, structures, buildings, equipment, hardware, fixtures, and other materials are protected against process and waste water, paint spillage, paint drips and other damage. Damage shall be corrected by cleaning, repairing or replacing the item as acceptable to Owner, at no additional cost to Owner.

#### 1.15 SHIPPING, HANDLING AND STORAGE

- A. Products shall be delivered in manufacturer's original unopened containers and shall be subject to inspection by Engineer. Packages shall not be opened until they are

inspected by Engineer and required for use. Each container shall have manufacturer's label, intact and legible. Label for each container shall contain the following:

1. Manufacturer's name
  2. Type of paint
  3. Manufacturer's stock number
  4. Color name and number
  5. Instructions for thinning, where applicable
- B. Where thinning is necessary, only the product of the manufacturer furnishing the paint shall be used. All such thinning shall be done strictly in accordance with the manufacturer's instructions, and with the full knowledge of Engineer.
- C. Materials and their storage shall be in full compliance with the requirements of pertinent codes and fire regulations. All painting materials shall be stored under cover in a clean, dry, well-ventilated place protected from sparks, flame, direct rays of the sun or extreme temperatures. Storage shall be maintained at a temperature between 40° F and 90° F, unless the requirements of the manufacturer are more restrictive. Receptacles shall be placed outside buildings for paint gates and containers. Paint waste shall not be disposed of in plumbing fixtures, drains or on the ground.

#### 1.16 ADDITIONAL PAINT

- A. At the end of the project, Contractor shall turn over to Owner one five-gallon can of each type and color of paint, primer, thinner or other coating used in the field painting of large painted surfaces such as concrete. Contractor shall turn over to Owner one one-gallon can of each type and color of paint, primer, thinner or other coating used in the field painting of small painted surfaces such as small pipes. If the manufacturer packages the material concerned in gallon cans, then it shall be delivered in unopened labeled cans as it comes from the factory. If the manufacturer does not package the material in gallon cans, and in the case of special colors, the materials shall be delivered in new gallon containers, properly closed with typed labels indicating brand, type, color, etc. The manufacturer's literature describing the materials and giving directions for their use shall be furnished in three bound copies. A type-written inventory list shall be furnished at the time of delivery.

## PART 2 -- PRODUCTS

### 2.01 MATERIALS

- A. Table 09900-1 depicts the coatings referenced in Article 3.07, "Paint Schedule".

Product Listing:

Reference Number	Description	Manufacturers Reference TNE MEC (or equal)
105	Hi-Build Epoxy	66 Color Hi-Build Epoxoline
106	Polyamine Epoxy	151-1051 Elasto-Grip FC
110	Aliphatic Acrylic Polyurethane	73 Color Endurashield
119	Surface Tolerant Epoxy	135 Chembuild
127	Waterborne Acrylate	156 EnviroCrete
128	Sand Textured Acrylate	157 EnviroCrete

B. No lead containing protective coating materials may be used on this project.

## 2.02 EQUIPMENT

A. Contractor shall furnish to the job site and use for coating inspection and make available to the Engineer, the following test equipment:

1. Thermometer
2. Steel surface temperature thermometers
3. Sling psychrometer
4. Psychrometric charts
5. SSPC-VIS-1 surface preparation standard
6. Keane-Tator Surface Comparator Number 372
7. Wet film thickness gauge
8. Dry film thickness gauge with certified thickness calibration plates
9. NBS Certified Coating Thickness Standards
10. Holiday Detector, low voltage type, Tinker and Razor Model M-1, Series 9533

## PART 3 -- EXECUTION

### 3.01 INSPECTION OF SURFACES

- A. Before application of the prime coat and each succeeding coat, all surfaces to be painted shall be subject to inspection by Engineer. Any defects or deficiencies shall be corrected by Contractor before application of any subsequent coating.
- B. Samples of surface preparation and of painting systems shall be furnished by Contractor to be used as a standard throughout the job, unless omitted by Engineer.

- C. Owner will inspect all phases of the Work to verify that it is in accordance with the requirements of the Specifications. Contractor shall facilitate this inspection as required, including allowing ample time for the inspections and safe access to the work.
- D. Contractor shall perform visual holiday inspection per SSPC TU 11 Standards.
- E. Hold point inspections may include, but are not limited to prepainting cleanliness, sufficiency of sanding for deglossing, exposed metal spot surface preparation, ambient conditions, paint application, film thickness measurement, film appearance and continuity, and adhesion. Contractor is not allowed to proceed with subsequent phases of the Work unless acceptable to Owner. Prior to demobilization in a particular section worked, a final acceptance inspection will be performed by Owner.
- F. The inspection by Owner in no way relieves Contractor of the responsibility to comply with all requirements of this specification, and to provide comprehensive inspections of its own to assure compliance with the acceptable Quality Control Inspection Plan. Contractor shall make available for Owner's review all quality control inspection documentation maintained in accordance with Contractor's Quality Control Inspection Plan.
- G. Contractor shall furnish, until final acceptance of the coating system, all equipment and instrumentation needed for self-inspection of all phases of the Work.
- H. Deviations or nonconformances are items that do not meet the specified requirements and require either rework or repair as determined by Owner. Deviations will be recorded by Owner. Contractor's representative shall initial and date the nonconformance acknowledging a deviation exists. All deviations shall be brought into conformance prior to partial payment for the applicable area.

### 3.02 EQUIPMENT

- A. Effective oil and water separators in conformance with ASTM D 4285 shall be used in all compressed air lines serving spray painting and sandblasting operations to remove oil or moisture from the air before it is used. Separators shall be placed as far as practicable from the compressor.
- B. All equipment for application of the paint and the completion of the work shall be furnished by Contractor in first-class condition and shall comply with recommendations of the paint manufacturer.

### 3.03 WORK IN CONFINED SPACES

- A. Contractor shall provide and maintain safe working conditions for all employees. Fresh air shall be supplied continuously to confined spaces through the combined use of existing openings, forced-draft fans, or by direct air supply to individual workers. Paint fumes shall be exhausted to the outside from the lowest level in the contained space.

- B. Electrical fan motors shall be explosion proof if in contact with paint fumes. No smoking or open fires will be permitted in, or near, confined spaces where painting is being done.

### 3.05 SURFACE PREPARATION

- A. General: Surface preparation shall be as specified in the following paragraphs, in the coating schedule or as recommended by the paint manufacturer's published application instructions, whichever imposes the most stringent requirements.
- B. Surfaces to be painted shall be clean and dry, and free of dust, rust, scale and all foreign matter. No solvent cleaning, power or hand tool cleaning shall be permitted unless acceptable to Engineer or specified herein.
- C. The manufacturer shall inspect all surfaces specified to receive protective coatings prior to surface preparation. The manufacturer shall notify the Engineer of any noticeable disparity in the surfaces which may interfere with the proper preparation or application of the repair materials or protective coatings.
- D. Except as otherwise provided, all preparation of metal surfaces shall be in accordance with SSPC Specifications SP-1 through SP-15. Where SSPC Specifications are referred to in these Contract Documents, the corresponding Pictorial Surface Preparation Standard shall be used to define the minimum final surface conditions to be supplied. Grease and oil shall be removed and the surface prepared by hand tool cleaning, power tool cleaning or blast cleaning in accordance with the appropriate Specification SP-1 through SP-15.
- E. Weld flux, weld spatter and excessive rust scale shall be removed by power tool cleaning as per SSPC-SP-3.
- F. Hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place prior to cleaning and painting, and not intended to be painted, shall be protected or removed during painting operations and repositioned upon completion of painting operations.
- G. Any abraded areas of shop or field applied coatings shall be touched up with the same type of shop or field applied coating, even to the extent of applying an entire coating, if necessary. Touch-up coatings and surface preparations shall be in addition to and not considered as the first field coat.
- H. Abrasives from blasting shall be thoroughly removed, using vacuums if necessary. No surface, which has been blasted, shall be painted until inspected by Engineer.
- I. Threaded portions of valve and gate stems, machined surfaces which are intended for sliding contact, surfaces which are to be assembled against gaskets, surfaces or shafting on which sprockets are to fit, or which are intended to fit into bearings, machined surfaces of bronze trim on slide gates and similar surfaces shall be masked off to protect them from the sandblasting of adjacent surfaces. Cadmium-plated or galvanized items shall not be sandblasted unless hereinafter specified, except that

cadmium-plated, zinc-plated, or sherardized fasteners used in assembly of equipment to be sandblasted shall be sandblasted in the same manner as the unprotected metal. All installed equipment, mechanical drives, and adjacent painted equipment shall be protected from sandblasting. Protection shall prevent any sand or dust from entering the mechanical drive units or equipment where damage could be caused.

- J. Hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place prior to cleaning and painting, and not intended to be painted, shall be protected or removed during painting operations and repositioned upon completion of painting operations.
- K. Any abraded areas of shop or field applied coatings shall be touched up with the same type of shop or field applied coating, even to the extent of applying an entire coating, if necessary. Touch-up coatings and surface preparations shall be in addition to and not considered as the first field coat.
- L. Exposed Pipe, Valves and Pumps: Bituminous coated pipe shall not be used in fully exposed locations. Pipe, valves, and pumps which shall be fully exposed after project completion shall be primed in accordance with the requirements herein. Any bituminous coated ferrous pipe which is inadvertently installed in exposed locations shall be sandblasted to SSPC-SP-5 White Metal before priming and painting.
- M. Ferrous Metal Surfaces:
  - 1. Ferrous metal surfaces in submerged or corrosive atmosphere shall be cleaned of all oil, grease, dirt, rust and tight and loose mill scale by abrasive blasting in accordance with the SSPC-SP5 White Metal Blast Cleaning with a 2 - 3 mil profile. Prime coat shall follow blasting before any evidence of corrosion occurs.
  - 2. All ferrous metal surfaces not required to be galvanized shall be cleaned of all oil, grease, dirt, rust and tight and loose mill scale by abrasive blasting in accordance with SSPC-SP-10 Near White Metal Blast Cleaning with a 2 - 3 mil profile. Prime coat shall follow blasting before any evidence of corrosion occurs.
  - 3. Field surface preparation of small, isolated areas such as field welds, repair of scratches, abrasions or other marks to the finish shall be cleaned by power tools in accordance with SSPC-SP-3, or in difficult and otherwise inaccessible areas by hand cleaning in accordance with SSPC-SP-2 and spot primed.
- N. Primed or Previously Coated Metal Surfaces: All coated surfaces shall be cleaned prior to application of successive coats. Cleaning shall be done in accordance with SSPC-SP-12 Water Jetting (LP WC - Low Pressure Water Cleaning / WJ-4 Light Cleaning). Utilize SSPC-SP 2 and / or SSPC-SP3 guidelines to address any rusted areas, bare exposed steel, damaged and/or loose coatings. Spot prime all hand and power tooled cleaned areas as required prior to application of the recommended coating system.
- O. Galvanized, Zinc, Copper and Other Nonferrous Metal Surfaces: All nonferrous metal surfaces shall be given one coat of metal passivator or metal conditioner before applying the prime coat. The passivator or conditioner, which may not be identified in



the paint schedule, shall be compatible with the complete paint system identified in the paint schedule.

P. Concrete and Masonry Surfaces:

1. Concrete and masonry surfaces to be painted shall be prepared by removing efflorescence, chalk, dust, dirt, grease, oil, form coating, tar and by roughening to remove glaze. Concrete surfaces shall receive a light abrasive blast to expose bug holes.
2. All concrete that is not sound or has been damaged shall be removed to a sound concrete surface. All surfaces shall be repaired prior to commencement of the coating operation.
3. Concrete and masonry surfaces are to be cured for at least 28 days prior to coating them.
4. Concrete surfaces specified by the paint manufacturer to be acid etched shall be etched in accordance with the manufacturer's instructions. The surface shall then be thoroughly scrubbed with clean water, rinsed, and allowed to dry. The surface shall be tested with a moisture meter to determine when dry before coating.
5. All rinse water shall be collected and properly disposed. The rinse water may only be discharged to the plant drains after being properly neutralized. Neutralization procedures must be approved in advance by the Engineer.

Q. Existing Concrete and Masonry Surfaces to be Repainted:

1. Surface preparation of existing concrete surfaces shall be in conformance with SSPC-SP13 / NACE No. 6 and the manufacturer's recommendations.
2. All concrete, masonry and stucco that is not sound or has been damaged shall be removed to a sound surface. Concrete, masonry and stucco shall be repaired as specified in other sections prior to applying protective coatings.
3. All contaminants including: oils, grease, unsound or incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other contaminants shall be removed.
4. Existing concrete surfaces to be coated shall be initially cleaned using low pressure, minimum 3,500 psi, water pressure in accordance with SSPC-SP12 / NACE No. 5. A maximum 5,000 psi water pressure in accordance with SSPC-SP-12 / NACE No. 5 may be required to remove additional surface contaminants such as efflorescence. The presurface preparation inspection by the manufacturer shall be performed after this initial cleaning.

- R. PVC Pipe Surfaces: Prior to painting, all PVC pipe surfaces shall be cleaned per SSPC-SP-1, followed by a light sanding with medium weight sandpaper. The pipe shall be free of sanding dust prior to painting.

- S. Aluminum Surfaces: Prepare the substrate in accordance with SSPC-SP1 guidelines to remove dirt, dust, oil and all other contaminants.

### 3.06 PREPARATION OF MATERIALS

- A. Mechanical mixers, capable of thoroughly mixing the pigment and vehicle together, shall mix the paint to use where required by manufacturer's instructions; thorough hand mixing will be allowed for small amounts up to one gallon.
- B. Pressure pots shall be equipped with mechanical mixers to keep the pigment in suspension, when required by manufacturer's instructions. Otherwise, intermittent hand mixing shall be done to assure that no separation occurs. All mixing shall be done in accordance with SSPC Volume 1, Chapter 4, "Practical Aspects, Use and Application of Paints" and/or with manufacturer's recommendations.
- C. Catalysts or thinners shall be as recommended by the manufacturer and shall be added or discarded strictly in accordance with the manufacturer's instruction.
- D. When using two component materials, only complete kits shall be mixed.

### 3.07 COATING SCHEDULE

- A. General: Contractor shall adhere to this coating schedule, providing those paints named or equal. DFT shall mean the total minimum dry film thickness per application measured in mils. Products are referenced by numbers listed in Article 2.01, "Materials," and listed in Table 09900-1.
- B. Metal Surfaces
  - 1. Existing metal surfaces exposed to the atmosphere that do not come into contact with corrosive atmospheres that require touch-up painting due to Contractor activities (such as welding to existing structures) including the following types of surfaces shall be painted:
    - a. Above ground piping, valves, pipe supports and appurtenances.
    - b. Pumps, motors and machinery.
    - c. Miscellaneous steel shapes, angles, ladders, cages, piping, etc located on or mounted to existing concrete or steel structures.
    - d. Existing exterior metal surfaces of large tanks, hoist support frames, handrails, checker plates, and miscellaneous equipment.
  - 2. Surface preparation for this application only shall be using a low pressure, minimum 5,000 psi water pressure in accordance with SSPC-SP12 / NACE No. 5, followed the utilization of SSPC SP3 guidelines to address rust and any damaged and / or loose coatings.

3. Coating System:

<u>Application</u>	<u>No.</u>	<u>Description</u>	<u>DFT</u>
Spot Prime	119	Surface Tolerant Epoxy	3.0 - 5.0
Second - 1 coat	119	Surface Tolerant Epoxy	4.0 - 6.0
Finish - 1 coat	110	Aliphatic Acrylic Polyurethane	<u>2.0 - 4.0</u>
			Min. Total 10 Mills

C. Metal Door Surfaces, Existing Exterior

- Existing painted metal door and frame surfaces exposed to the atmosphere shall be painted as follows:

2. Coating System:

<u>Application</u>	<u>No.</u>	<u>Description</u>	<u>DFT</u>
First - 1 coat	105	Hi-Build Epoxy	2.0 - 3.0
Finish - 1 coat	110	Aliphatic Acrylic Polyurethane	<u>2.0 - 4.0</u>
			Min. Total 4 Mills

Contractor shall paint the exterior surfaces of doors and the entire surfaces of door frames. Cleaning shall be done in accordance with SSPC-SP-2 and / or SSPC-SP-3.

D. Concrete, Stucco and Masonry Surfaces, Existing

- Previously painted exterior concrete and masonry surfaces.

2. Coating System:

<u>Application</u>	<u>No.</u>	<u>Description</u>	<u>DFT</u>
First - 1 coat	106	Polyamine Epoxy	1.0 - 2.0
Finish - 1 coat	128	Sand Textured Acrylate	<u>6.0 - 8.0</u>
			Min. Total 7 Mills

E. Concrete, Stucco and Masonry Surfaces, New

- All new exterior concrete, block or stucco surfaces, exterior painted surfaces that are modified and repaired, including but not limited to the following types of surfaces, shall be painted as follows:

- a. All new exterior building stucco surfaces.
- b. Exterior painted surfaces that are modified due to repaired spalled and cracked stucco.

2. Coating System:

<u>Application</u>	<u>No.</u>	<u>Description</u>	<u>DFT</u>
First - 1 coat	127	Waterborne Acrylate*	5.0- 6.0
*Contractor shall stripe coat hairline cracks with Coating No. 127.			
Second - 1 coat	106	Polyamine Epoxy	1.0 - 2.0
Finish - 1 coat	128	Sand Textured Acrylate	<u>6.0 - 8.0</u>
			Min. Total 12 Mils

F. PVC Piping and Appurtenances

- 1. PVC pipes, valves, and accessories, shall be coated as follows:
- 2. Coating System:

<u>Application</u>	<u>No.</u>	<u>Description</u>	<u>DFT</u>
Finish - 1 coat	105	Hi-Build Epoxy	2.0 - 3.0
Finish - 1 coat	110	Aliphatic Acrylic Polyurethane	<u>2.0 - 3.0</u>
			Min. Total 4.0 Mils

G. Painted Aluminum Surfaces

- 1. Existing exterior handrails shall be coated as follows:
- 2. Coating System:

<u>Application</u>	<u>No.</u>	<u>Description</u>	<u>DFT</u>
First - 1 coat	105	Hi-Build Epoxy	2.0 - 3.0
Finish - 1 coat	110	Aliphatic Acrylic Polyurethane	<u>2.0 - 3.0</u>
			Min. Total 4.0 Mils

3.08 COATING APPLICATION

- A. General: All paint shall be applied by experienced painters with top quality, properly styled brushes, rollers, sprayers or other applicators reviewed by Engineer and the paint manufacturers Coatings shall be applied in accordance with the requirements of this Section, the coating manufacturer's product data sheet, and SSPC-PA1. In the

event of a conflict between the manufacturers' technical data and the requirements of this Section, this Section shall govern unless the requirements of the manufacturer are more restrictive.

- B. Quality of Surface Preparation: Contractor shall verify that the surface exhibits the specified degree of cleaning immediately prior to painting. Contractor shall reclean deficient areas prior to applying coatings. If contamination of the surface (e.g., dust) occurs prior to the application of the first full coat, all contamination shall be removed prior to painting.
- C. Time Restrictions: Coatings shall only be applied to bare metal surfaces on the same day that the surface preparation was performed.
- D. Ambient Conditions Restrictions: Coatings are not to be applied under the following conditions. If the manufacturer's requirements are more restrictive, the manufacturer's conditions shall govern.
  - 1. Surface and Air Temperatures: Between 50°F and 100°F.
  - 2. Relative Humidity: Less than 85%.
  - 3. Dew Point: Surface temperature shall be at least 5°F warmer than the dew point temperature of the surrounding air.
  - 4. Dampness / Rain: Coatings are not to be applied to surfaces that are damp, have free standing water, during rain, during fog, or similar detrimental weather conditions.
- E. Any paint that is exposed to unacceptable conditions (e.g. rain or dew) shall be removed and replaced prior to adequate curing.
- F. The work areas which have been blasted and received any coating shall be protected as not to have ongoing blasting and painting operation affect previously prepared surfaces.
- G. The primer shall not be applied on a nonprepared surface. Previous blasted and primed surfaces shall be tied in by blasting 2-inches into primed area.
- H. The number of coats specified shall be minimum number acceptable. Apply additional coats as needed to provide a smooth, even application and achieve the specified DFT.
- I. Application Methods: Regardless of application method used, paint drips, splashes, and spills must be controlled.
  - 1. Roller Application: Nap size, roller quality and application technique shall be selected that will properly wet the substrate and produce a smooth, uniform film. When applying paint to circular or tubular structural elements, roll circumferentially wherever feasible rather than longitudinally for film uniformity.

2. Brush Application: Bristle lengths, bristle quality and application techniques shall be selected that will properly wet the substrate and produce a smooth, uniform film. Because of the emphasis on aesthetics on this project, brushes shall be used only when the use of rollers is not feasible.
  3. Daubers: On surfaces such as the back side of the anchor bolts which inaccessible for paintbrushes, sheepskins, mitts or daubers especially constructed for the purpose shall be used when acceptable to the Engineer.
  4. Sprayers: Paint may be applied with spraying equipment that is appropriate for the job conditions and is acceptable to the manufacture. If the material has thickened or must be diluted for application by spray gun, each coat shall be built up to the same film thickness achieved with undiluted brushed-on material. Where thinning is necessary, only the products of the particular manufacturer furnishing the paint shall be used; and all such thinning shall be done in strict accordance with the manufacturer's instructions, as well as with the full knowledge of Engineer.
- J. Coverage and Continuity: Aesthetics of the application is critical. Each coat shall be applied at the proper consistency in a workmanlike manner to assure thorough wetting of the substrate or underlying coat, and to achieve a smooth, streamline surface. All shadow-through, pinholes, bubbles, blisters, fish eyes, skips, misses, drips, lap marks between applications, or other visible discontinuities in any coat shall be repaired before the application of subsequent coats. Runs or sags may be brushed out while the material remains wet. All surfaces shall be thoroughly coated with special attention to hard-to-reach areas, and irregular surfaces such as crevices and fasteners. When coating configurations such as bolts, material shall be applied from multiple directions to assure complete coverage.
- K. Alternating Coats: Provide at least two shade difference between coats. The finish coat shall have sufficient hiding power to cover intermediate coat color. Visible detection of the underlining coat will not be acceptable.
- L. Recoat Times: Each coating shall only be applied after the previous coat has been allowed to dry as required by the manufacturer's written instructions, but as soon as possible to minimize the length of time that the coating is exposed to dust and contamination. Coatings shall not be allowed to remain exposed for longer than the manufacturer's written instructions prior to overcoating. If a coat exceeds the manufacturer's maximum recoat times for any reason, the coating shall be removed and replaced. As an alternative, the coating manufacturer can provide written instructions for specialized preparation (e.g., scarifying the surface) to properly prepare the surface to receive the next coat. The specialized steps can be undertaken only if acceptable to Engineer in writing. The specialized cleaning or removal and replacement of the coatings shall be performed at no additional cost to Owner.
- M. Surface Cleanliness Between Coats: The surface of each coat shall be thoroughly cleaned prior to the application of the next to remove dirt, dust, and other interference material. Particular attention shall be paid to the removal of detrimental residue from surfaces such as corners and pockets. Surfaces shall be cleaned by brushing,

vacuuming, or blowing down with compressed air. If the coatings are slightly tacky, methods such as vacuuming shall not be used. If grease or oil has become deposited on the surface of any of the applied coats, the contaminants shall be removed by solvent cleaning in accordance with SSPC-SP-1 prior to the application of the next coat.

- O. Wet Film Thickness: A wet film thickness gage shall be used in accordance with ASTM D 4414 to verify the thickness of each coat at the time of application. The thickness of each coat shall be strictly controlled to assure that the minimums necessary to achieve complete coverage are applied. Frequent measurement of wet film thickness is required to assure that proper coating thickness is being applied.
- P. Dry Film Thickness: The dry film thickness objectives for the project are indicated in the Coating Schedule. The thickness of the existing coating must be accounted for when measuring the thickness of the newly applied coats. Coating thickness shall be determined by the use of a properly calibrated "Nordson-Mikrotest" (or equal) dry mil thickness gauge or other measuring instrument determined to be appropriate by Engineer. Measurements shall be made in accordance with SSPC PA-2.
- Q. Coating Adhesion: All applied coats shall be well adhered to each other and to the substrate. If the application of any coat causes lifting of an underlying coat, or there is poor adhesion between coats or to the substrate, the coating shall be removed in the affected area and the material reapplied. If the adhesion of the system is suspect, adhesion tests shall be conducted in accordance with ASTM D 3359, ASTM D 4541 or ASTM D 6677 as indicated by Engineer, and all test area repaired. The acceptance criteria for the testing will be established by the coating manufacturer and Engineer.
- R. Destructive Testing: If there are questions regarding the nondestructive measurements of coating thickness, a Tooke Gage will be used when authorized by Engineer. Measurements shall be made in accordance with ASTM D 4138. Areas damaged by the testing shall be marked and repaired, whether created by Engineer or Contractor.

### 3.9 HOLIDAY TESTING

- A. Surfaces identified to receive holiday testing shall be tested by the Contractor in the presence of the Engineer with a wet-sponge, low-voltage holiday detector after the coating system has cured. The sponge shall be kept saturated with an electrolyte (5% sodium chloride) and a surfactant (2% household detergent). During testing the wet sponge shall be kept in continuous contact with the painted surface. Locations where holidays are detected shall be marked for repair and retested after repair work has been completed. Holiday testing shall be performed in accordance with SSPC SPO-188.

### 3.10 REPAIR OF DAMAGE AND UNACCEPTABLE COATINGS

- A. Surface Preparation of Localized Areas: For the repair localized damage, corrosion, and unacceptable coatings, the surface shall be prepared by solvent cleaning in accordance with SSPC-SP-1 using a solvent that is acceptable to the paint manufacturer. If the damage does not extent to the substrate, the area shall be prepared by power tool cleaning to remove all loose material in accordance with SSPC-

SP-1 or SP-3. If the damage extends to the substrate, the affected areas shall be prepared in accordance with SSPC-SP-11.

- B. Feathering of Repair Areas: Contractor shall feather sand the existing coating surrounding each repair location. A distance of one to two inches shall be feather sanded to provide a smooth, tapered transition into the existing intact coating. The edges of coating around the periphery of the repair areas shall be verified that they are tight and intact by probing with a dull putty knife in accordance with the requirements of SSPC-SP-3. The existing coating in the feathered area shall be roughened to assure proper adhesion of the repair coats.
- C. Coating Application in Repair Areas: When the bare substrate is exposed in the repair area, all coats of the system shall be applied to the specified thickness. When the damage does not extend to the bare substrate, only the damaged coat(s) are to be reapplied. The thickness of the system in overlap areas shall be maintained within the specified total thickness tolerances. When, in the judgment of Engineer, the finish coat repair has a spotted appearance, a cosmetic coat of finish shall be applied over the spot areas and adjacent surfaces to blend the repair area into the surrounding coating.

### 3.11 MATERIAL SAFETY DATA SHEETS

- A. Material Safety Data Sheets (MSDS) shall be maintained at the job site for each chemical product on the job site, including but not limited to coatings, thinners, solvents, cleaning agents, abrasives, welding materials, and flexible sealant material.
- B. Contractor and Owner shall exchange MSDS of any hazardous chemicals that are or will be stored at the Project site. Contractor and Owner shall each appoint an individual who shall be responsible for overseeing the proper exchange of information regarding toxic chemicals, potential hazards, safe procedures, and proper protective equipment, etc. It is anticipated that Owner will not have materials requiring MSDS on site during the work-in-process.

### 3.12 HOUSEKEEPING AND WASTE DISPOSAL

- A. The accumulation of empty paint cans, combustibles, and other debris is unacceptable. Waste chemical solutions, oily rags, and waste shall be removed from the site daily.
- B. All paint drips and splashes shall be removed from surfaces not intended to be painted. Removal shall be by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- C. Contractor shall handle, store, transport, and dispose of all hazardous and nonhazardous project waste in strict accordance with Federal and State regulations.

### 3.13 SCHEDULE OF COLORS

- A. All colors to be painted shall conform to the following System Color Coding Schedule. The Contractor shall submit color samples to the Engineer as specified in Article 1.07.



The Contractor shall submit suitable samples of all colors and finishes for the surfaces to be painted, or on portable surfaces when required by the Engineer. The Engineer shall decide upon the choice of colors and other finishes when alternates exist. No variation shall be made in colors without the MDWASD's approval. Color names and/or numbers shall be identified according to the appropriate color chart issued by the manufacturer of the particular product in question.

Piping System Color Coding:

Type of System	Substance in Pipe	Color		
		Piping	Band	Labeling
Water Pipeline	Raw or Recycle	Olive Green	--	White
	Settled or Clarified	Aqua	--	Black
	Finished or Potable	Dark Blue	--	White
	Concentrate	Brown	--	White
	Other Lines	Light Gray	--	Black
Chemical Pipelines	Alum or Primary Coagulant	Orange	--	Black
	Ammonia	White	--	Black
	Carbon Slurry	Black	--	White
	Caustic	Yellow	Green	Black
	Chlorine (Gas and Solution)	Yellow	--	Black
	Chlorine Dioxide	Yellow	Violet	Black
	Fluoride	Light Blue	Red	Black
	Lime Slurry	Light Green	--	Black
	Ozone	Yellow	Orange	Black
	Phosphate Compounds	Light Green	Red	Black
	Polymers or Coagulant Acids	Orange	Green	Black
	Potassium Permanganate	Violet	--	White
	Soda Ash	Light Green	Orange	Black
	Sulfuric Acid	Yellow	Red	Black
Sulfur Dioxide	Light Green	Yellow	Black	

### 3.14 COLOR CODING AND LETTERING OF PIPING

#### A. General

1. The Contractor shall paint all piping, valves, equipment, exposed conduits and all appurtenances which are integral to a complete functional mechanical pipe and electrical conduit system, in accordance with the Color Coding Schedule to be provided by the City of Hallandale Beach during Shop Drawing review. Colors will be selected from the paint manufacturer's standard color charts.
2. In general, the pumps and equipment shall be painted the same color as the piping system to which it is connected unless otherwise directed by the Engineer.

B. Banding: Where bands are indicated in the Color Coding Schedule, the pipe is to be painted for its full circumference with a band of the color indicated. The bands shall be six inches wide, neatly made by masking, and spaced eight feet apart. The Contractor may substitute pre-cut pre-finished bands on piping subject to acceptance by the Engineer. Where banded pipes are running concurrently in a space, bands shall be located so that on adjacently located pipes, bands will be grouped beside each other.

#### C. Lettering of Piping

1. The Contractor shall apply identification titles and arrows indicating the direction of flow of liquids to all types and sections of piping.
2. Titles shall be as described in the Pipe Schedule. Identification titles shall be located midway between color coding bands where possible.
3. Identification lettering and arrows shall be placed as directed by the Engineer, but shall be located every ten feet and shall be properly inclined to the pipe axis to facilitate easy reading. Titles shall also appear directly adjacent to each side of any wall or slab the pipeline passes through, with a minimum of two titles on each pipe in one structure.
4. The titles shall identify the contents by complete name at least once in each area through which it passes and thereafter be abbreviated.
5. The numbers and letters shall be die-cut from pressure sensitive minimum 3.5 mil vinyl film pre-space on carrier tape. Adhesive and finish surface shall be protected with one piece removable lines. Color shall be black on white as directed and shall have an overall height in inches. See Height of Pipe Lettering Chart shown below.
6. Letter type shall be Helvetica Medium upper case. The manufacturer's instructions shall be followed in respect to storage, surface preparation and application.
7. For piping less than  $\frac{3}{4}$ -inch diameter, the Contractor shall furnish and attach corrosion resistant color tags with the required lettering.

Diameter of Pipe or Pipe Covering	Height of Piping Lettering
$\frac{3}{4}$ to $1\frac{1}{4}$ inches	$\frac{1}{2}$ inch
$1\frac{1}{2}$ to 2 inches	$\frac{3}{4}$ inches

2½ to 6 inches	1¼ inches
8 to 10 inches	2½ inches
Over 10 inches	3½ inches

### 3.15 ANSI AND OSHA SAFETY COLORS

- A. Items specified in the following subsections shall be safety color coated as specified. ANSI colors shall conform with (OSHA) ANSI Z53.1 and latest revisions. Materials shall be compatible with the system specified for the equipment, concrete, etc. Where a coating system is not specified and safety colors are required, the items shall be coated with a primer and two coats of an industrial enamel.
- B. Red: Items listed in ANSI Z53.1, Section 2.1 shall be painted ANSI Red. In general, these items shall include fire protection equipment and apparatus; wall mounted breathing apparatus, danger signs and locations; and stop bars, buttons or switches. In addition, all hose valves and riser pipes, fire protection piping and sprinkler systems, and electrical stop switches shall be painted ANSI Red.
- C. Orange: Items listed in ANSI Z53.1, Section 2.2 shall be painted ANSI Orange. ANSI Orange shall be used as a basic color for designating dangerous parts of machines or energized equipment which may cut, crush, shock, or otherwise injure and to emphasize such hazards when enclosure doors are open or when gear belt or other guards around moving equipment are open or removed, exposing unguarded hazards. In addition, moving machinery having a linear or peripheral speed in excess of 10 feet per minute, which is either inadequately guarded due to physical problems or may be operated with the guard removed, rims or sprockets, gears, pulleys, etc.; crossheads of large engines and compressors; and flywheels shall be coated ANSI Orange.
- D. Yellow: Items listed in ANSI Z53.1, Section 2.3 shall be painted ANSI Yellow. Yellow shall be the basic color for designating caution and for marking physical hazards such as striking against, stumbling, falling, tripping, and "caught in between". In addition, an 8-inch wide strip on the top and bottom tread of stairways shall be coated.
- E. Green: Items listed in ANSI Z53.1, Section 2.4 shall be painted ANSI Green. Green shall be the basic color for designating safety and the location of first-aid equipment. In general, gas masks, first-aid kits, eye wash facilities, and safety deluge showers shall be coated with ANSI Green.
- F. Blue: Blue shall be used for designating caution, limited to warning against the starting, the use of, or the movement of equipment under repair or being worked upon.
- G. Purple: Items listed in ANSI Z53.1, Section 2.5 shall be painted ANSI Purple. In general, atomic sludge density meters shall be coated ANSI Purple.

### 3.16 CLEANING

- A. Contractor shall protect at all times, in areas where painting is being done, floors, materials of other crafts, equipment, vehicles, fixtures, and finished surfaces adjacent to paint work. Before the start of painting work, all electrical wall plates, surface hardware, nameplates, gauge glasses, etc., shall be covered.
- B. At completion of the work, remove all paint where spilled, splashed, splattered, sprayed or smeared on all surfaces, including glass, light fixtures, hardware, equipment, painted and unpainted surfaces.
- C. Work areas shall be at all times kept free from accumulation of waste material and rubbish caused by the work. At the completion of the painting, all tools, equipment, rigging, scaffolding, surplus materials, and all rubbish shall be removed and the area left clean.

- END OF SECTION -