

SECTION 01010SUMMARY OF WORKPART 1 - GENERAL1.1 DESCRIPTION

- A. Work under this contract lies within the boundaries of the Portland Water District's East End Wastewater Treatment facility located at 500 Marginal Way in Portland, Maine.
- B. The major work under this contract consists of, but is not limited to, the following:
1. Renovation of:
 - a. Existing gaseous disinfection building to new sodium bisulfite building;
 - b. Existing gaseous dechlorination building to new sodium hypochlorite building;
 2. Construction and Installation of:
 - a. Fourteen (14) new chemical feed pumps and associated piping and appurtenances;
 - b. Four (4) new sodium hypochlorite bulk storage tanks and associated piping and appurtenances;
 - c. Two (2) new sodium bisulfite bulk storage tanks and associated piping and appurtenances;
 - d. New carrier water pumps for sodium bisulfite solution delivery;
 - e. New sample water pumps to feed the existing chlorine residual analyzers;
 - f. New mud valves on the drain line for the chlorine contact tanks;
 - g. Relocation of existing Truck Scale currently located in the garage bay of the dechlorination building;
 - h. Miscellaneous site improvements including;
 - site piping;
 - grading;
 - asphalt repair.
 - i. Three (3) PLC-based control panels to control functions of the temporary dechlorination facilities and the new disinfection and dechlorination facilities.
 - j. Miscellaneous field instrumentation including but not limited to a new high range chlorine residual analyzer, ultrasonic level measurement for chemical storage tanks and chemical flow meters.
 - k. Heating and ventilation upgrades to the sodium hypochlorite building and the sodium bisulfite building.
 - l. Miscellaneous structural modifications to the sodium hypochlorite building and the sodium bisulfite building to accommodate the upgraded storage facilities.
 - m. Electrical and other ancillary control.
 - n. Other appurtenances as shown on the Drawings and specified herein.
 3. Demolition/Removal of:
 - a. Chlorine gas disinfection system;
 - b. Sulfur dioxide dechlorination system;

- c. Other equipment as shown on the Drawings and specified herein.
 4. Construction, installation, testing and start-up and of a temporary dechlorination facility to allow construction of the upgraded facilities.
 5. Maintaining plant operations as detailed in Part 3 of this section.
- D. Removals, Relocations and Rearrangements:
 1. Examine the existing site for the work of all trades that will influence the cost of the work under the general bid. This work shall include removals, relocations, and rearrangements which may interfere with, disturb or complicate the performance of the work under the general bid and coordination with existing facilities. The Contractor is responsible for all coordination in this regard.
 2. Provide in the lump sum bid item a sufficient amount to include all removals, relocations, rearrangements and reconnections specified herein, shown on the Drawings, necessary or required to provide approved operation and coordination of the combined new and existing systems.
- E. Temporary Dechlorination Facilities:
 1. The nature of the work, with the conversion of existing facilities from gaseous chemical to liquid-based chemical facilities, will require the installation of a temporary dechlorination system to facilitate construction while allowing the Owner to maintain compliance with its discharge license. Requirement of such has been specified in section 11234. A temporary dechlorination system control panel shall be provided under this Contract to control the temporary dechlorination system. The system must maintain all the functions that currently exist in the Owners present dechlorination control system.
 2. Contractor shall connect the temporary dechlorination system panel to the Owners existing PLC network, in either the Hypochlorite building or the Bisulfite building, to allow the temporary control panel the ability to obtain information from the existing control system (flow and chlorine residual) to run the temporary dechlorination system.
 3. Provide in the lump sum bid item a sufficient amount to include all shelter, equipment, connections and services specified in the Contract Documents and/or shown on the Drawings to provide such facilities.
- F. Associated Work Provided by Others:
 1. The Owner has retained the Engineer to complete the responsibilities associated with programming of the new PLC-based control panels, and associated operator terminals provided under this contract, and to complete associated modifications to its existing SCADA system. Panels provided under this contract, to be programmed, commissioned, started-up, tested, as well as training of the Owner's staff on the operation and control of the new control systems by others, include:
 - a. Temporary Dechlorination Control Panel
 - b. New Sodium Hypochlorite Control Panel
 - c. New Sodium Bisulfite System Control Panel
 2. Contractor shall review the sequence of construction outlined in paragraph 3.2, Construction Sequence, of this section and note the stipulated timeframes provided within that the Contractor must plan for associated with work completed by

others. These stipulated timeframes for the commissioning, start-up and training of the specific control system by the Engineer shall be allowed for under the Contractor's schedule.

3. The storage, use and handling of gaseous chemicals comes under OSHA's Process Safety Management regulation. The Owner shall properly dispose of gas containers and purge associated gas lines, prior to the Contractor conducting any demolition operations. Contractor to coordinate demolition or modification activities with Engineer and Owner.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 MAINTAIN OPERATION

A. Existing Operations:

1. The existing plant provides primary and secondary treatment, disinfection and dechlorination of wastewater flows up to approximately 36.8 MGD. During normal flows up to this value, all flow receives secondary treatment and is disinfected and dechlorinated prior to release to Casco Bay. During high flow events the facility can receive a peak flow up to 80 MGD. When flows exceed 36.8 MGD, the remainder is bypassed around the secondary treatment system and chlorinated and de-chlorinated by a separate disinfection & dechlorination system. The systems are flow paced and trimmed by chlorine residual. Two chlorine contact tanks exist, one for secondary treated flows and the other for bypassed flows. The Owner presently utilizes both tanks for secondary treated flows, but isolates the secondary side from the primary side via a sluice gate in the influent channel during bypass events.
2. Routine laboratory analyses are performed in conjunction with treatment. Treatment plant maintenance equipment and vehicles are stored on the premises.
3. Utilities include municipal water, electric power, and fuel oil.
4. The facility receives routine deliveries of gaseous chemicals (chlorine and sulfur dioxide) in the garage bays of the existing chlorination and dechlorination buildings. Additionally, the Owner receives septage from outside contractors by which charges associated with its disposal are levied with the use of the existing truck scale system located in the existing dechlorination building garage.
5. Operation in and around the existing Chlorination Building and Dechlorination Building falls under Process Safety Management regulations from OSHA (29 CFR 1910.119). At all times, the Owner shall provide a representative to accompany the Contractor while in these Buildings. At no time shall the Contractor be allowed to be inside either of these Buildings without the presence of the Owner or Engineer.
6. The Contractor must subject all employees and subcontractors to Awareness Training, provided by the Owner, on the operations of the existing systems. The Contractor's authorized site superintendent shall also be subject to Process Training,

provided by the Owner. Work in and around these Buildings may require a Management of Change process to be filed with the Owner prior to starting work, consistent with OSHA requirements. The Contractor shall be responsible for complying with all Process Safety Management Requirements as it pertains to work on this project.

B. Maintain Treatment:

1. State and federal regulations require that the treatment facility remain operational (provide primary and secondary treatment, disinfection and dechlorination of all received flows) at all times during the construction work under this contract.
2. The Contractor's operations shall not hinder the delivery, storage and use of materials and supplies, nor hinder staff duties, nor disrupt utility service.
3. The Owner must have access to the existing plant and equipment at all times unless a specific exception is granted by the Owner, in accordance with these specifications.
4. The Contractor shall provide for continuous ability of treatment facility personnel to safely pass through areas of work, both interior and exterior, in accordance with these specifications.
5. The Contractor must maintain power to all existing facilities during construction. Electrical work may require temporary power feeds to accommodate demolition and modifications.
6. The disinfection and dechlorination systems are controlled by three PLC-based control panels. One panel is located in the existing Dechlorination Building; one in the existing Chlorination Building, and the other in the Control Room of the Process Building. These PLC's are networked through an Allen-Bradley DH⁺ PLC network. The current control system is interdependent upon each other to function. This functionality must be preserved, as required, during construction.
7. In order to maintain the required degree of treatment and operations, the Contractor shall:
 - a. Install a temporary dechlorination system prior to the onset of any demolition of existing dechlorination facilities located in the existing dechlorination building. Refer to Section 11234 for further details.
 - b. Not interrupt or otherwise disrupt the existing disinfection system until the new sodium hypochlorite system has been tested and accepted by the Owner, and is fully operational.
 - c. Be held fully liable for any fines imposed upon the Owner by the Maine Department of Environmental Protection resulting from disruptions to the disinfection and dechlorination systems caused by his operations.
 - d. Be aware of and fully accommodate periodic deliveries of chemicals needed to maintain the existing, temporary and new disinfection and dechlorination facilities.
 - e. Schedule his operations for the replacement of carrier water pumps and fixed weirs so that a minimum of one of the two existing secondary chlorine contact tanks are operational at all times.
 - f. Be aware and make accommodations for the periodic conveyance of wet weather related flows through the bypass chlorine contact tank during such events (requiring both tanks to be placed online simultaneously).

- g. Schedule his operations to minimize the downtime associated with the relocation of the truck scale currently located in the garage bay of the dechlorination building.

C. Minimize Interference

1. It is the Owner's standard policy that all visitors and construction personnel sign in/out at the Process Building each day to quantify who is onsite. Contractor shall comply with this requirement or be subject to removal from jobsite or possible issuance of a stop work order.
2. The Contractor shall at all times conduct his operations so as to interfere as little as possible with existing works. The Contractor shall develop a program, in cooperation with the Engineer, Owner and interested officials, which shall provide for the construction and putting into service of the new works in the most orderly manner possible. This program shall be adhered to except as deviations therefrom are expressly permitted.
3. Work of connecting with, cutting into and reconstructing existing pipes or structures shall be planned to interfere with the operation of the existing facilities for the shortest possible time and when the demands on the facilities best permit such interference. It may be necessary to work outside of normal working hours to minimize interference. Before starting work which will interfere with the operation of existing facilities, the Contractor shall do all possible preparatory work and shall see that all tools, materials, and equipment are made ready and at hand.
4. Any demolition of existing concrete, ductwork or equipment in the existing buildings shall require the Contractor to keep dust from entering the Electrical Rooms in either building and from entering the Chlorine Residual Pumps/Analysis Room in the Dechlorination building. Contractor shall provide temporary measures as required to control the exposure of dust to the treatment plant personnel and the remainder of the facility. The Contractor shall provide for continuous safe passage around work for treatment facility personnel.
5. The Contractor shall not use the Owner's bathrooms or kitchen facilities.
6. The Contractor shall limit his personnel to the proposed work areas and limits of work.
7. The Contractor shall not use the facility elevator for any purpose.
8. The Contractor shall limit parking of workers and subcontractors to the areas designated by the Owner. On-site speed limit is 10 MPH.
9. Demolition and construction material shall be stored in an area approved by the Owner. The Contractor shall be responsible for securing the area in accordance with state and federal safety regulations.

3.2 CONSTRUCTION SEQUENCE

- A. Construction of the proposed treatment facilities will disrupt the existing treatment plant structures and piping. To maintain treatment, and to minimize disruption, the construction must be sequenced appropriately. There are specific requirements for construction sequencing and phasing (including time requirements). The Contractor shall submit a construction sequence that recognizes the requirement that the facility

provide bypass and secondary chlorination and dechlorination at all times throughout the construction period and adheres to the specified sequencing and phasing discussed below.

- B. The Contractor shall submit to the Engineer for review and acceptance a detailed schedule and sequence of construction prior to commencing any work. This schedule shall include the Contractor's plans for doing the work.
- C. The Contractor shall include the cost of all temporary facilities required to isolate construction areas from wastewater flows during the construction period in this bid. The cost shall include the cost for all labor, tools, equipment, materials, bypass pumping, etc. as necessary.
- D. The Contractor may wish to consider, at his option, the following proposed construction sequencing outline. The proposed construction sequencing outlined directs attention to the project's general requirements but does not purport to cover all necessary requirements for a detailed project construction sequencing plan. No construction shall begin until the Engineer as formally received, reviewed and accepted the proposed schedule and sequence of construction. It should be noted that several items contained within are specific requirements that must be adhered to in order to complete the construction and to provide proper coordination with work being performed by others (PLC and SCADA system programming; and control system commissioning, testing, start-up.)
 - 1. Relocate existing truck scale currently located at existing dechlorination building to its new designated location. Scale must be fully operational and available for use by the Owner within one month of relocation.
 - 2. Construct temporary shelter/building and install temporary dechlorination system to allow for conversion of existing dechlorination building to new Hypochlorite Building. This temporary system shall meet requirements as specified in Sections 15000 and 11234.
 - 3. Upon completing the temporary system and starting up all associated equipment, provided under this contract Contractor shall allow the Engineer three (3) weeks within his schedule to allow the temporary dechlorination system to be fully automated, tested and commissioned, and accepted by the Owner prior to placing into service. This testing of the control system shall be performed by the Engineer.
 - 4. Upon Owner acceptance of temporary dechlorination system, the Owner shall properly dispose of all gas cylinders and purge all gas lines. Engineer will provide the Contractor a written notice to commence with demolition of equipment in existing Dechlorination Building. At the Owners discretion, if testing noted above in item 3 is completed prior to the end of the three week period for testing, the Owner may continue to operate the Sulfur Dioxide system through the end of the three week period as to exhaust remaining quantities of chemical prior to disposal.
 - 5. Demolish existing gaseous dechlorination equipment in existing Dechlorination Building (hereinafter referred to as the Hypochlorite Building).
 - 6. Complete all necessary building modifications (heating and ventilation, structural, architectural, electrical, etc.) to the new Hypochlorite Building.

7. Install new sodium hypochlorite bulk storage tanks, chemical feed pumps and associated appurtenances in the new Hypochlorite Building.
8. Construct new sample lines between the chlorine contact tanks and the Hypochlorite Building.
9. Extend existing carrier water line into Hypochlorite Building.
10. Construct new RAS hypochlorite feed lines, backup chlorination line, spare lines and manholes between the Hypochlorite Building and the Activated Sludge Pump Building.
11. Once the modifications are completed to the new Hypochlorite Building, which includes all start-up of furnished equipment, field instrumentation, etc., the contractor shall provide a period of three weeks within his schedule to allow the new hypochlorite system to be fully automated, tested and commissioned, and accepted by the Owner prior to placing into service. This testing of the control system shall be performed by the Engineer.
12. Upon Owner acceptance of the hypochlorite system, Engineer will provide the Contractor a written notice to commence with demolition of equipment in existing chlorination building. At the Owners discretion, if testing noted above in item 11 is completed prior to the end of the three week period for testing, the Owner may continue to operate the Chlorine Gas system through the end of the three week period as to exhaust remaining quantities of chemical prior to disposal.
13. Items nos. 14 through 23 may be performed at any time after Notice to Proceed is given.
14. Construct new sodium bisulfite solution line and carrier water lines to the existing Chlorination Building (herein after referred to as the bisulfite building). Do not connect lines at this time.
15. Closing the existing influent gates to the secondary chlorine contact tank (48" x 60" alum slide gates) divert normal influent flows to bypass chlorine contact tank. Isolate and drain the secondary chlorine contact tank to facilitate construction of:
 - a. Demolition of existing sample pumps and piping;
 - b. New sample pumps and connections to new sample lines;
 - c. Demolition of the existing carrier water pumps;
 - d. New carrier water pumps;
 - e. Replacement of mud valves;
 - f. Installation of new fixed weirs.
16. Place secondary chlorine contact tank back online and drain and clean bypass chlorine contact tank to facilitate construction of:
 - a. Demolition of existing sample pumps and piping;
 - b. New sample pumps and connections to new sample lines;
 - c. Replacement of mud valves;
 - d. Installation of new fixed weirs.
17. Upon acceptance of new hypochlorite system Contractor shall switch over to new system and demo old chlorine gas chlorination system.
18. Complete all necessary building modifications (heating and ventilation, structural, architectural, electrical, etc) to the new sodium bisulfite building.

19. Install new sodium bisulfite bulk storage tanks, chemical feed pumps and associated appurtenances in the new bisulfite facility.
20. Make connections to existing carrier water and sodium bisulfite solution yard piping noted in item 14 above.
21. Upon completing the bisulfite system and starting up all associated equipment, Contractor shall allow the Engineer three (3) weeks within his schedule to allow the new dechlorination system to be fully automated, tested and commissioned, and accepted by the Owner prior to placing into service. This testing of the control system shall be performed by the Engineer.
22. Upon acceptance of the permanent bisulfite system Engineer shall provide the Contractor a written notice to fully demolish the temporary dechlorination system.

END OF SECTION