

1. GENERAL

1.1 Work Included

- .1 Installation, including the supply of baseplates, anchor bolts, and start up and testing of equipment supplied under this Contract and other supply contracts.

1.2 Definitions

- .1 Testing: In this division, testing shall be defined as the operation of a specific item of equipment under actual and/or simulated conditions for the purpose of ensuring the equipment satisfies its basic design criteria. Testing shall be conducted by the Contractor. All materials, labour, and equipment required to conduct the tests shall be the Contractor's responsibility.
- .2 Commissioning: In this division, commissioning shall be defined as the operation of equipment systems under actual and/or simulated conditions for the purpose of ensuring the system performs its intended functions. Refer to Section 13035.

1.3 SUBMISSIONS

- .1 The Contractor shall check all the shop drawings relative to the equipment and materials, dimensions, measurements, size of members, type of materials, controls, list of equipment being supplied, names of manufacturers, and other details to satisfy himself that they are correct and conform to the requirements and intent of the Contract.

2. PRODUCTS

2.1 Equipment Supplied by Contractor

- .1 All equipment listed in the specifications, or shown on the Drawings shall be installed by the Contractor unless indicated otherwise or specified in 2.2.
- .2 Determine the extent of equipment to be installed from the specifications, list of equipment and materials and Manufacturer's Drawings covering the equipment. All additional materials necessary to complete the installation shall be furnished and installed by the Contractor.

2.2 Equipment Supplied by the City

- .1 Refer to Section 01210 – City Supplied Equipment
- .2 All City-supplied equipment is stored at the City's storage yard at 1500 Plessis Road. The Contractor shall include for loading, delivery to the work site, unloading, handling and installing the City supplied equipment.

2.3 Existing Equipment

- .1 Existing equipment required to be removed shall be removed as specified in Section 02070.

2.4 Anchor Bolts

- .1 All anchor bolts used for this Contract shall be 316 stainless steel.
- .2 Anchor Bolts: The bolts for the pump control valve and the pumping unit base plates shall be sized to suit manufacturer requirements and shall meet the requirements of Section 05500, Clause 2.1.3 - Anchor Bolts.
- .3 The use of drilled expansion anchors for any equipment will not be allowed unless by prior agreement between the Contract Administrator and the Contractor.

3. EXECUTION

3.1 Coordination

- .1 Coordinate the Work specified under this Section with the work of other Sections and Contracts to produce a complete and workmanlike job.

3.2 Preparation

- .1 Before commencing installation of the Work, inspect and take field measurements and ensure that work carried out previously in the area is not prejudicial to the proper installation of the Works.
- .2 Refer to the equipment specifications for assistance in determining the form in which equipment will be shipped and the extent of field assembly required.
- .3 Schedule the visits to the site, of the Supplier's serviceman, for the times and periods specified in other sections. Cooperate with the serviceman in his supervision of the installation and start up and follow all reasonable instructions of the serviceman. Should the Contractor require the serviceman to attend for longer or more frequent periods he shall arrange this, at his own expense, with the Supply Contractor.

3.3 Installation of Equipment

- .1 All equipment specified in other sections, detailed on the equipment specifications, or shown on the Drawings is to be installed by the Contractor.
- .2 Equipment supplied by the City shall be installed by the Contractor in accordance with the manufacturer's recommendations.
- .3 Mount butterfly valves with the shaft in the horizontal direction.
- .4 When joining valves to pipe fittings, do not over torque bolts to correct for misalignment.

- .5 Support valves in position using temporary supports until valves are fixed in place.
- .6 Dimensions shown on the Drawings for equipment bases, piping connections, etc., are approximate and must be corrected by the Contractor to suit the dimensions of the exact equipment selected for each application. Any necessary modifications to piping connections or to pipework shall be arranged by the Contractor at his own expense and must be acceptable to the Contract Administrator.
- .7 Supply all necessary shims, gaskets, etc., and all necessary lifting and loading equipment and tools, etc., required to complete the installation. Provide Type 304 stainless steel flat shims and taper shims for the proper setting of the base plate and the pumping equipment prior to grouting, as recommended by the equipment supplier.
- .8 Where equipment is supplied with a plate steel base, set anchor bolts in sleeves to permit minor adjustment during installation. The base will provide access holes in the top of the plate, and the Contractor is to use a pour grade, non-shrink, non-metallic grout to fill the entire void under the base once the equipment is aligned properly and at the correct elevation.
- .9 Prepare grout as specified in Division 3 and provide full contact with the equipment base unless otherwise recommended by the equipment manufacturer and agreed by the Contract Administrator. Shims shall be removed, the voids shall be neatly patched and the grout shall be neatly bevelled, formed or trimmed as shown or required.
- .10 The sequence of installation shall be as follows:
 - .1 Level machine base on anchor bolts, use non-ferrous shims, not more than three pieces.
 - .2 Carry out preliminary alignment
 - .3 Attach piping, etc.
 - .4 Carry out final alignment
 - .5 Eliminate soft foot
 - .6 Grout base
 - .7 Demonstrate to the City, Contract Administrator and Supply Contractor the final alignment, no soft foot, no pipe strain.
- .11 Extend any inaccessible lubrication points and lubricant drains to convenient locations. Remove storage lubricant and provide the initial fill of new lubricants for the equipment. Lubricant grade to be as recommended by the equipment suppliers.

3.4 Quality Assurance Forms

- .1 All process equipment will be tested to ensure it operates in accordance with the basic design criteria in the specifications. The Contractor will be required to have a series of forms

completed which attest to the proper installation and functioning of the equipment. Copies of these forms are included in Division 1.

END OF SECTION