

PART 1 GENERAL

1.1 SUMMARY

- .1 The work under this Division includes the supply, delivery, installation, testing, start-up and adjusting of all equipment and devices to provide a fully operational system as shown on the drawings and as specified herein; in complete accord with applicable codes and ordinances.

1.2 CONTRACTOR REQUIREMENTS

- .1 The complete work under this trade is governed by the dictates of good practice in all details of materials and methods even if not minutely specified. The complete work is to be properly co-ordinated with the work and requirements of other trades specified in other sections.

1.3 LIABILITY

- .1 Include under this section of work, the installation of all equipment and devices, which are supported by the piping, and pipe supports even though the said equipment and devices are specified under another section. As clarification, such equipment and devices include pumps, control valves, valves, fittings, flow measuring devices, pressure regulating valves and/or any other items associated with processing and fittings, and include all testing of such equipment and devices.
- .2 Included in the work, though not minutely detailed on the drawings or described in the specifications, is the supply and installation of connections to piping for instruments, and associated valves.
- .3 Schedule and layout of work, the work and supply of materials and equipment by subcontractors and for any damage caused by subcontractors during the installation of this work. Provide the full time services of an experienced mechanical superintendent for this class and type of work.
- .4 Arrange and schedule work in complete co-ordination with other trades on the project and proceed in a manner that will not interfere with the work of other trades being carried out in the building.
- .5 Install work in advance of concrete pouring and provide all sleeves where required. In places where other pipes and equipment are to be installed pertaining to this contract, co-ordinate with other trades and install all pipes to the best advantage.
- .6 In areas where equipment and piping supplied by the Contractor is to be built in with the work of other trades; the Contractor is responsible for supplying the equipment and piping to be built in. If this equipment or piping is not on site, supply all necessary measurements to allow appropriate openings to be left.

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- .7 Install all equipment, list station package, piping, valving and appurtenances as shown in the drawings. If, in the opinion of the Departmental Representative, the work is not properly installed as directed, remove and re-install at the expense of the contractor.
 - .8 Protect all finished and unfinished work, including the work done by other contractors, from damage during the execution work. Any damage to surfaces or any other parts resulting from the execution of his work is to be at the expense of the Contractor and be repaired to the satisfaction of the Departmental Representative.
 - .9 Examine carefully the design drawings to ensure that the work carried out under this contract can be properly carried out without modifications to the work as shown on the drawings. Before commencing work examine the work of other trades and report any interferences or defects affecting the work of this section to the Departmental Representative.
 - .10 Supply all labour, materials and plant necessary and be required to complete the piping installation and all associated items as shown on the drawings and/or as mentioned, referred to or described in these specifications.
 - .11 Supply, deliver, install, test and adjust ready for operation new pumping units as specified herein including motors, drive and all appurtenances necessary for a complete operating system.

1.4 DRAWINGS AND SPECIFICATIONS

- .1 Base all measurements and elevations from established benchmarks and verify all measurements and elevations before proceeding with his work.
- .2 Establish all elevations associated with the correct installation of all mechanical equipment and piping and complete mechanical systems as required to provide their proper operation.

1.5 SHOP DRAWINGS

- .1 Submit drawings in accordance with Section 01 33 00 - Submittal Procedures.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver and distribute all materials at the site. Load and unload all pipe and fittings by lifting with hoists or skidding so as to avoid shock or damage. Do not drop materials under any circumstances. Do not skid or roll pipe handled on skidway against pipe already on the ground. Keep the interior of all pipes free from dirt and foreign matter at all times. Pile pipe in strict accordance with the manufacturer's recommendations.
- .3 Handle all materials and equipment so that exterior and interior surfaces and pre-fabricated joints are not damaged. Repair any surface coating or lining damaged at own expense, in a manner satisfactory to the Departmental Representative.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Collect and separate for disposal packaging material for recycling in accordance with Waste Management Plan.
- .3 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

1.8 TRIAL USAGE OF EQUIPMENT

- .1 The Departmental Representative reserves the right to use any piece of equipment, device or material installed under this contract for such reasonable time as the Departmental Representative may require to make a thorough test of that same equipment prior to completion and acceptance of any part of the contract.
- .2 It is agreed and understood that no claim for damage for any injury or breakage to any part or parts of the same equipment due to the aforementioned tests whether caused by weakness or inaccuracy of parts or by defective materials or workmanship of any kind.
- .3 Supply labour, material and instruments for testing.
- .4 Obtain written permission from the Departmental Representative to use permanent equipment and systems, prior to acceptance by the Departmental Representative, including testing.

1.9 EQUIPMENT LUBRICATION

- .1 Maintain and lubricate any equipment placed in operation before the completion of the contract in accordance with the manufacturer's instructions.
- .2 Clearly identify and make fully accessible all oiling and lubrications points for equipment installed under this division.

1.10 OPERATION AND MAINTENANCE MANUAL

- .1 Submit operation and maintenance information in accordance with Section 01 91 61 - Operation and Maintenance Manual.

1.11 AS-BUILT DRAWINGS

- .1 Submit as-built drawings in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide project "As-Built" drawings to the Departmental Representative before application for final payment.
- .3 Prepare the "As-Built" drawings in the form of marked-up blueprints and mark deviation as the project progresses. Pay particular attention to the location of underground piping,

together with dimensions and locations of items which normally are hidden from sight by the wet well and storage structures, finishes or other equipment.

- .4 Accurately record day-by-day:
 - .1 Deviations from the original drawings.
 - .2 Additions or deletions from the original drawings.
 - .3 Location of all shut-off, isolating and control valves.
 - .4 Location of all major mechanical equipment.
- .5 Keep these drawings neat and legible and turn them over to the Departmental Representative upon completion of the project. The Departmental Representative will provide a complete set of construction drawings for this purpose just after the contract is awarded.

1.12 CHANGES

- .1 The location of small pipe runs or copper tubing may be altered, without charge to the Departmental Representative, provided that the change is requested by the Departmental Representative before installation and does not require additional material.
- .2 Where pipe and tubing runs are not shown on the drawings or are shown only schematically; install in such a way as to conserve headroom and interfere as little as possible with the free use of the space through which they pass.
- .3 Make changes to pipe work only after consultation with the Departmental Representative.

1.13 RULES, REGULATIONS, AND ORDINANCES

- .1 Perform in strict accordance with all Federal, Provincial and Local rules, regulations, ordinances or statutes pertaining to installations of this type. Employ journeyman status tradesmen that are fully qualified under Provincial, Interprovincial and Federal Regulations pertaining to the licensing and qualifications for tradesmen for this work.
- .2 Obtain and deliver to the Departmental Representative all necessary certificates of approval and inspection of work before request for acceptance and final payment for the work.

1.14 QUALITY OF MATERIAL AND WORKSMANSHIP

- .1 All materials which are described in these specifications and on the drawings to be new and the best of their respective kinds. All work and materials to be at all times open to inspection acceptance or rejection by the Departmental Representative, but any failure or omission on the part of the Departmental Representative to disprove or reject any work or materials is not an acceptance of any defective work or material.
- .2 Remove, at own expense, any work or material rejected by the Departmental Representative and rebuild and replace the same to the satisfaction of the Departmental Representative without additional charge.

1.15 PAINTING

- .1 All equipment is to be suitably finished and painted at the factory before shipment.
- .2 Finish items requiring painting as indicated below or as directed by the Departmental Representative.
- .3 Without restricting the generality of the above, the items to be painted include, but are not necessarily limited to the following:
 - .1 Equipment that is prime coated only
 - .2 Equipment factory finished which requires touch-up
 - .3 All piping, hangers and supports, with the exception of galvanized or plastic. To be painted in accordance with section 09 91 23 – Interior Painting.
- .4 Do not finish the following items unless otherwise specified or directed by the Departmental Representative:
 - .1 Stainless steel
 - .2 Bronze or brass surfaces
 - .3 Aluminum
 - .4 Polished shafts and trim on equipment
 - .5 Stems of valves
 - .6 Instrument dials
 - .7 Instrument bodies and cases.

1.16 CUTTING AND PATCHING

- .1 Leave and/or provide openings as required for the installation of piping and equipment, and include provision of templates and/or location of holes, recesses or other openings.
- .2 Correct or cut, at own expense, any errors or omissions in the location of the aforementioned holes, etc. Provide all inserts, anchors, hangers, etc., to be placed in the concrete.
- .3 Provide of all openings required to install new pumps, pipes, fittings and other equipment.

1.17 EQUIPMENT INSTALLATION

- .1 Supply and install all items of piping, material and equipment, which are described in these specifications and shown on the drawings.
- .2 The installation of all equipment is to be in strict accordance with the manufacturer's instructions and recommendations. All such work is subject to the Departmental Representative's approval.
- .3 Properly align all equipment units one to the other and with the connecting piping before grouting in place.
 - .1 Control alignment so that excess forces are not imposed on equipment when piping connections are tightened.

- .2 Align motors, shim and couple to fit to shafts, to the tolerances given by the manufacturer.
- .3 Furnish all labour, transportation and hoisting equipment and pour all concrete bases, provide and set all anchor bolts and grout equipment to bases as required for installing the units.
- .4 Grouts: Use "Embeco" as manufactured by Master Builders Inc., or Stearnson "Ferrogrout" as manufactured by G.F. Stearnson and Sons, according to the manufacturer's directions, for grouting equipment to concrete bases as required.
 - .1 Equipment is not to be tightened until grout is set. Bolt or tighten so that there are no excessive stresses set up in flanges.
 - .2 Use dowels to secure concrete bases for pumps to concrete slab unless shown otherwise on the drawings.
- .5 Each item of equipment is subject to an operating test after installation, as required by the Departmental Representative.
- .6 Assist the Departmental Representative in conducting tests as may be required. Make good all defects in the operation of equipment units due to faulty installation or damage. Guarantee the equipment as to the operation and installation for the one year maintenance period as specified herein.
- .7 Obtain all necessary instructions and assistance services, which are required for installation of the various items of equipment, which the Contractor is supplying and/or installing. Bear costs of the services provided by the manufacturers or suppliers.

1.18 EQUIPMENT IDENTIFICATION

- .1 The drawings designate the size, line service specification, symbols and numbering of all pipe, fittings, valves and equipment to be supplied by the Contractor.
- .2 Identify mechanical equipment with nameplates and labels as follows:
 - .1 Lamicoid 3 mm thick plastic engraving sheet, white face, black core, mechanically attached unless specified otherwise.

Size 1	12 x 70 mm	1 line	5 mm high letters
Size 2	10 x 50 mm	1 line	3 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters
- .3 Wording on nameplates and labels to be approved by Departmental Representative prior to manufacture.
- .4 Allow for average of twenty-five letters per nameplate and label.

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- .5 Identification to be English.

1.19 CLEANING

- .1 Cleaning to be done in accordance with Section 01 74 11 - Cleaning.
- .2 Before operating any item of installed equipment for tests, check and lubricate all equipment with the manufacturers recommended oils and grease.
- .3 Leave all equipment in a neat and orderly appearance and ready for operation by Parks personnel. The condition of all items of equipment and piping must have the Departmental Representative's approval before final acceptance.

1.20 INSPECTION AND TESTING

- .1 Perform equipment inspection and testing as follows:
- .1 Arrange to have the manufacturer's representative on-site for installation approval, start-up and testing of the equipment.
 - .2 Perform all tests in the presence of the Departmental Representative.
 - .3 Bear all costs for the manufacturer's representatives for on-site visits.

1.21 GUARANTEE

- .1 All equipment units, supplied by the Contractor, to be guaranteed to perform in accordance with the requirements of these specifications. Furnish and install, without charge, a duplicate of any part, which proves defective in material, workmanship or performance within one year from the date of certified acceptance of the equipment. Guarantee re-installation of equipment resulting from faulty installation within the one year maintenance period. If the Contractor, for any reason, fails to make repairs or replacements when requested to do so, the Departmental Representative may take the action indicated in the Contract Documents.

1.22 MATERIAL INSPECTION

- .1 All material is subject to inspection and testing for soundness and suitability at the discretion of the Departmental Representative. Bear all costs of all material testing.
- .2 Join all pipe in strict adherence with the manufacturer's instructions, which are considered as being part of these specifications. As each section of the system is completed, test in the manner specified, and in the presence of and as approved by the Departmental Representative.
- .3 All material found during the progress of the work to have cracks, flaws, or other defects, or to be of doubtful quality will be rejected by the Departmental Representative. Promptly remove from site all rejected materials.

END OF SECTION