

PLUMBING EQUIPMENT

1. GENERAL

1.1 Section Includes

- .1 This Section specifies the supply, factory testing, delivery, and supervision of installation, testing and performance verification of plumbing equipment.

1.2 Reference Standards

- .1 The following is a list of standards which may be referenced in this Section:
 - .1 Provincial Plumbing Code and the requirements of local authorities having jurisdiction.
 - .2 Canadian Gas Association (CGA).
 - .3 CSA/CSA Label on Fixtures and Equipment.
 - .4 ASHRAE: 90.1, Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings.
 - .5 ASME: Boiler and Pressure Vessel Code SEC VIII, D1, Rules for Construction of Pressure Vessels.
 - .6 ASTM:
 - .1 A48, Standard Specification for Gray Iron Castings.
 - .2 A48, Gray Iron Castings
 - .3 A108, Steel Bars, Carbon Cold Finishes, Standard Quality
 - .4 A276, Stainless Steel and Heat-Resisting Steel Bars and Shapes
 - .5 A532, Abrasion Resistant Cast Iron
 - .6 D4101, Specification for Polypropylene Injection and Extrusion Materials.
 - .7 AWWA:
 - .1 C510, Double Check Valve Backflow Prevention Assembly.
 - .2 C511, Reduced-Pressure Principle Backflow Prevention Assembly.
 - .3 C550, Protective Epoxy Interior Coatings for Valves and Hydrants.
 - .8 CSA:
 - .1 B64.4, Backflow Preventers, Reduced Pressure Principle Type (RP).

PLUMBING EQUIPMENT

- .2 B64.5, Backflow Preventers, Double Check Valve Type (DCVA).
- .3 C22.1 Canadian Electrical Code, Safety Standard for Electrical Safety Installations
- .9 Factory Mutual Engineering and Research Corporation.
- .10 NEC.
- .11 NEMA: MG 1, Motors and Generators.
- .12 NSF.
- .13 UL.
- .14 ULC.
- .15 Hydraulic Institute Standards, Standards of the Hydraulic Institute, 14th Edition

1.3 Design

- .1 Design and select plumbing equipment specifically with high efficiency, low energy consumption and innovative technology.
- .2 Supply and install totally enclosed fan-cooled type electric motors unless noted otherwise.

1.4 Shop Drawings

- .1 Action Submittals: Shop Drawings:
 - .1 Complete specifications, descriptive drawings, catalog cuts, and descriptive literature that include make, model, capacity, pump curves, dimensions, weight of equipment, and electrical schematics for products specified.
 - .2 Recommended procedures for protection and handling of equipment and materials prior to installation.
 - .3 Installation instructions.
 - .4 Special tools.
- .2 Informational Submittals:
 - .1 O&M Data: As specified in Section 01730 – Operation and Maintenance Manuals.
 - .2 Complete description of operation together with general arrangement and detailed drawings, wiring diagrams for power and control schematics, parts catalogues with complete list of repair and replacement parts with section

PLUMBING EQUIPMENT

drawings, illustrating the connections and the part Manufacturer's identifying numbers.

- .3 Certificate of Satisfactory Installation, Form 102, as indicated in Section 01650 – Equipment Installation.

2. PRODUCTS

2.1 Domestic Water Booster Pump System

- .1 General: complete packaged triplex (2 duty, 1 standby) booster pump system, including constant volume pumps, hydromatic tank, controls, control panel, piping, valves, and appurtenances, factory assembled, skid mounted, prewired, and tested.
- .2 Pumps: end suction, closed coupled vertical in-line centrifugal.
- .3 Hydromatic Tank:
 - .1 Prepressurized diaphragm type per data sheet at end of section.
 - .2 Shell: welded steel, ASME rated and stamped.
 - .3 Diaphragm: FDA approved, replaceable heavy-duty butyl with polypropylene liner with complete separation between water and shell.
 - .4 Maximum Operating Pressure: 862 kPa (125 psi).
 - .5 Maximum Operating Temperature: 52°C (125°F).
 - .6 Finish: Manufacturer's standard air-dry enamel.
 - .7 Accessories: Supports, bladder access flange, drain, air-charging valve, and lifting lug.
- .4 Piping:
 - .1 Material: Schedule 40 stainless steel.
 - .2 Fittings: Screwed or flanged for 50 mm and smaller, flanged and welded for 65 mm and larger.
 - .3 Gasket Material: Free from corrosive alkali or acid ingredients and suitable for use in potable water lines.
 - .4 Isolation Valves: Full port ball or butterfly type.
 - .5 Pump Check Valves: Combination pressure-reducing and nonslam type, epoxy coated, field adjustable pressure setting.

PLUMBING EQUIPMENT

- .6 Pressure Gauges: 115 mm dial, 2 percent accuracy, stainless steel bourdon tube with snubber and gauge cock valve.
- .7 Flow Gauge: Pipeline-mounted flow sensor with visual indication.
- .5 Controls:
 - .1 Control Panel: UL listed, NEMA 4 enclosure, single point electrical connection.
 - .2 Starter: Magnetic, across the line with thermal overload.
 - .3 Control Switch: ON/OFF/AUTO switch for each pump with indicating lights.
 - .4 Alarms: Audio and visual as well as auxiliary contacts to Building Automation System as indicated on system schematic.
 - .5 Pump Alternation: Automatic lead/lag control based on pressure transducer, including automatic transfer on pump failure.
 - .6 Safety Controls: Thermal resets, low-suction pressure cutout.
 - .7 Flow Sequencing: Automatic, 5-step control.
 - .8 Pressure Monitoring and Control System: Completely redundant for failure of primary system.
- .6 Capacity: refer to Booster Pump Schedule in Section 15999, List of Schedules.
- .7 Accepted Manufacturers: S.A. Armstrong, Bell & Gossett, Paco Pumps.

2.2 Backflow Preventers

- .1 Reduced Pressure Backflow Preventers (65 mm through 250 mm):
 - .1 Description:
 - .1 Regulatory Compliance: AWWA C511, CSA B64.4, FCCHR of USC Section 10, ASSE 1013.
 - .2 Valve Body: Ductile or cast iron, Class 125, epoxy-coated (FDA approved).
 - .3 End Connections: flanged.
 - .4 Maximum Working Pressure: 1207 kPa (2413 kPa test).
 - .5 Temperature Range: 0 to 60°C.

PLUMBING EQUIPMENT

- .6 Shutoff Valves: non-rising stem, resilient seated gate valves with bronze ball valve test cock.
- .7 Inlet Strainer: cast-iron wye strainer, Class 125 flanged, fusion epoxy AWWA C550 coated, perforated stainless steel screen (1.5 mm perforations on 65 mm to 100 mm; 3 mm perforation on 150 mm to 250 mm), threaded cap plug blowout opening.
- .8 Accessories: drain line air gap fitting.
- .2 Acceptable Manufacturers:
 - .1 Febco - Model 860.
 - .2 Watts - Model 909.
- .2 Reduced-Pressure Backflow Preventers (20 mm through 50 mm):
 - .1 Description:
 - .1 Regulatory Compliance: AWWA C511, CSA B64.4.
 - .2 Valve Body: bronze.
 - .3 End Connections: threaded, NPT.
 - .4 Maximum Working Pressure: 1207 kPa (2413 kPa test).
 - .5 Temperature Range: 0 to 60°C.
 - .6 Shutoff Valve: full port, resilient seated, bronze ball valve with bronze ball valve test cock.
 - .7 Inlet Strainer: Bronze wye strainer, 40-mesh perforated, Type 304 stainless steel.
 - .2 Accessories: drain line air gap fitting.
 - .3 Acceptable Manufacturers:
 - .1 Febco.
 - .2 Watts.

2.3 Backwater Valve

- .1 Valve:
 - .1 Flapper type backwater valve, lacquered cast iron body, no hub inlet and outlet, sealed bolted cover, automatic bronze flapper which hangs during periods of non-operation.
 - .2 Accepted Manufacturer and Product: Mifab BV1000.

PLUMBING EQUIPMENT

- .2 Housing:
 - .1 Power epoxy-coated 10-gauge fabricated steel access cover and housing with gasketed, non-skid, reinforced steel cover for deep rough-in.
 - .2 Accepted Manufacturer and Product: Mifab BV1280.

3. EXECUTION

3.1 Installation

- .1 Install, arrange, and connect equipment as shown on Drawings and in accordance with Manufacturer's recommendations.

3.2 Extra Materials

- .1 Provide any special tools required for the maintenance of the equipment supplied. Special tools are tools which are not normally available in mechanic's or millwright's tool kit and which are peculiar to the equipment supplied.

END OF SECTION