

- 1 General
 - 1.1 **SUMMARY**
 - .1 Section Includes
 - .1 Labour, Products, equipment and services necessary to complete the Work of this section.
 - 1.2 **SUBMITTALS**
 - .1 Shop Drawings
 - .1 Submit Shop Drawings in accordance with Section 01 33 00.
 - .2 Operation and Maintenance Data
 - .1 Submit printed operation instructions and maintenance data in accordance with Section 01 33 00.
- 2 Products
 - 2.1 **PUMP GENERAL REQUIREMENTS**
 - .1 The following are minimum construction requirements, unless specified elsewhere.
 - .1 Pump casings:
 - .1 Close grained cast iron or cast bronze as specified.
 - .2 Fitted with casing or impeller wear rings, or both.
 - .2 Impellers:
 - .1 Enclosed bronze or duralloy.
 - .2 Dynamically balanced.
 - .3 Mounted on carbon steel shaft fitted with stainless steel or bronze sleeves.
 - .3 Seals:
 - .1 Suction pressures less than 690 kPa (100 psi): Fitted with mechanical seals.
 - .2 Stuffing box pressure in excess of 690 kPa (100 psig): Balanced type seals.
 - .3 Pumps with packing glands: Fitted with stainless steel shaft sleeves for full length of stuffing box.
 - .4 Performance
 - .1 Characteristic curve to be continuously rising to from run-out to shut-off.
 - .2 Select pump to operate within flow range from 30% below point of maximum efficiency to 10% above that point for impeller diameter chosen.

- .3 Installed impeller diameter not to exceed 90% of maximum impeller diameter catalogued for pump casing.
- .4 Motors to be sized for continuous operation without motor overload at runout condition for impeller size and rotational speed selected.

2.2 **SANITARY SUMP PUMPS**

.1 Construction

- .1 Simplex (Duplex) pump set.
- .2 Centrifugal sewage pump, vertical, shaft driven, single stage, non-clog.
- .3 Cast iron casing and cast iron semi-open impeller, alloy steel shaft.
- .4 Ball thrust bearing, bronze guide bearings, grease lubrication.
- .5 Cast iron motor support.
- .6 Motor.
- .7 Schedule 40 black steel pump leg and discharge pipe.

.2 Fitments

- .1 Aluminum cover plate complete with structural steel curb frame suitable for grouting into a concrete sump, and heavy gasket.
- .2 Coordinate delivery of curb frame to meet construction requirements. Frame will be installed by General Trades when pouring concrete sump.
- .3 300 x 300 mm inspection cover in the cover plate.
- .4 NPS 3 vent tapping.
- .5 Sleeved holes for mounting float rods.

.3 Access Ladder

- .1 Provide a hot dipped galvanized steel ladder 450 mm wide.
- .2 75 x 13 mm stringers.
- .3 19 mm diameter rungs at 300 mm o.c.
- .4 Provide first step 150 mm below manhole.
- .5 Locate steps in concrete formwork before concrete is poured.

.4 Simplex Pump Control

- .1 Simplex Pump automatically controlled by liquid level switch mounted on a bracket attached to floor plate.
- .2 Complete with brass float rod, limit stops, float rod guide, and seamless copper float.
- .3 Single point power supply.

.5 Duplex Pump Control

- .1 Duplex pumps automatically controlled by (a mechanical) (an electric) alternator.
- .2 Automatically alternates lead pump and operates both pumps on high flow demand.
- .3 Provide alternator control assembly complete with starters, mounting bracket, brass float rod, limit stops, float rod guide, copper float and control transformer.
- .4 Single (Dual) point power supply.

.6 Manufacturers

- .1 S.A. Armstrong
- .2 ITT-Goulds
- .3 Paco
- .4 Aurora
- .5 Pentair - Hydromatic

2.3 **SUBMERSIBLE SUMP PUMP**

.1 Construction

- .1 Bronze (Cast iron) construction with semi-open type bronze impeller to pass solids of 32 mm diameter.
- .2 Stainless steel shaft.
- .3 Integrally cast base and discharge elbow.
- .4 Motor with built-in thermal overload protection, and sealed from contact with pumped fluid.

.2 Pump Control

- .1 Automatic operation by a diaphragm actuated, factory set, integral liquid level control (floats to be oil resistant).
- .2 Complete with 3 m long ULC approved waterproof, three-wire power cable with U-ground moulded plug.

.3 Manufacturers

- .1 Xylem Flygt
- .2 Goulds
- .3 Little Giant
- .4 Grundfos
- .5 Pentair - Hydromatic

2.4 **PROCESS SUMP PUMP CONTROLS**

- .1 Where Required
 - .1 Process effluent sump tanks.
 - .2 Where shown on Drawings.
- .2 Level Control
 - .1 Magentrol Model 103 F EP/VP-TDM-S13-S13 explosion proof electrical liquid level control, Arrangement No. 1.
 - .2 Suitable for liquid operating conditions of 20°C (68°F) and specific gravity of 0.90 to 1.0.
 - .3 Level controller to be supplied with 3 m of cable and NPS 4 1035 kPa (150 lb) steel mounting flange.
 - .4 Install level control inside NPS 8, Schedule 40 steel stilling pipe with NPS 4 flange at top. Cut four 50 mm wide x 300 mm high slots in top and bottom of NPS 8 stilling pipe starting 75 mm above bottom and 75 mm below cover plate.
- .3 Sequence of Operation
 - .1 When level in pit drops to 300 mm above bottom of pit, level controls stop pump.
 - .2 When level in pit rises to 900 mm above bottom of pit, level controls start pump.

2.5 **CONTROL AND MONITORING SYSTEMS (~~FUTURE~~ BAS INTEGRATION)**

- .1 Any vendors that are authorized dealers or distributors of the following control systems are acceptable:
 - .1 Delta Controls
 - .2 Reliable Controls
 - .3 Schneider Electric SmartX Series
 - .4 Distech Controls
 - .5 Johnson Controls Facility Explorer
 - .6 Honeywell CIPer series, Spyder Models 5 or 7
- .2 BAS System Integration:
 - .1 All control systems must be integrated to the City's J2 Innovations Fluid Integration (FIN) serve, including but not limited to the following:
 - .1 Graphical user interface (monitoring and control)
 - .2 Alarming
 - .3 Data Trending
 - .4 Data Archiving
 - .5 Project Haystack naming convention

- .2 The installer must be licensed by J2 Innovations to sell, install, program and configure Fluid INtegration (FIN).
 - .3 Building Controllers (BC) must be Tridium Niagara JACE with the Haystack module and driver. The installer must be a licensed Tridium system integrator for any Tridium BCs or embedded or edge Niagara Framework products used. Soft JACE is not accepted.
 - .3 Licensing Requirements
 - .1 Licenses shall be provided to and in the name of the City of Toronto
 - .2 Licenses shall be perpetual, transferrable, assignable and royalty free.
 - .1 Tridium Licenses shall allow all workbench/supervisor brands complete system access and functionality.**
 - .4 Installer and Manufacturer Qualifications**
 - .1 Installer shall have an established working relationship with Control System Manufacturer.**
 - .2 Installer shall have successfully completed control system's control system training. Upon request, installer shall present record of completed training including course outlines.**
 - .3 It is the intent of these specifications to define an open protocol state-of-the-art distributed computerized Building Management and Control System, which is user friendly, has known reliability, is extremely responsive, and which is to be designed, installed, implemented, and supported by a local office of approved bidders.**
 - .4 BAS Contractor provides three locations for successful installations of similar open protocol computer-based systems. Sites provided must consist of more than 150 hardware inputs/outputs. Project sites must be local to the location of this project.**
- 3 Execution
 - 3.1 **INSTALLATION**
 - .1 General
 - .1 Make piping and electrical connections to pumps.
 - .2 Check pump rotation.
 - .3 Set up and adjust controls.
 - .4 Pipe drain tapping to drain.
 - .5 Install gauges.
 - .2 Sanitary Sump Pumps
 - .1 Power wiring between starters and pump motors. Line side wiring will be connected to starters under (Division 26) (a separate Electrical Contract).

- .2 Provide gate valve and non-slam counterweighted check valve and flexible metal hose just above cover plate, in discharge line from each pump. Set counterweight arm in horizontal position.
 - .3 Keep discharge piping clear of pumps to facilitate removal from sump.
 - .4 Align pump assembly after mounting and securing cover plate.
- .3 Submersible Sump Pump
- .1 Provide check valve just below cover plate in discharge line from each pump.
- End of Section