

Part 1 General

1.1 REFERENCES

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet for fixtures and equipment.
 - .2 Submit WHMIS MSDS. Indicate VOC's for adhesive and solvents during application and curing.
- .3 Shop Drawings.
 - .1 Submit shop drawings to indicate:
 - .1 Equipment, including connections, fittings, control assemblies and ancillaries. Identify whether factory or field assembled.
 - .2 Wiring and schematic diagrams.
 - .3 Dimensions and recommended installation.
 - .4 Pump performance and efficiency curves.
- .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .5 Instructions: submit manufacturer's installation instructions.
- .6 Manufacturers' Field Reports: manufacturers' field reports specified.
- .7 Closeout submittals: submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals, include:
 - .1 Manufacturers name, type, model year, capacity and serial number.
 - .2 Details of operation, servicing and maintenance.
 - .3 Recommended spare parts list with names and addresses.

Part 2 Products

2.1 SUMP PUMP SUBMERSIBLE

- .1 Capacity: as indicated.
- .2 Construction: CSA approved, heavy duty cast iron casing, dual mechanical seals, stainless steel 300 series shaft, cast iron, two vane semi-open, non-clog impeller to handle 75mm diameter spherical solids.
- .3 Motor: as indicated, hermetically sealed, with automatic overload protection.
- .4 Acceptable material: Bell and Gossett, Goulds, Gorman Rupp, or approved equal in accordance with B6.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.2 INSTALLATION

- .1 Make piping and electrical connections to pump and motor assembly and controls as indicated.
- .2 Ensure pump and motor assembly do not support piping.
- .3 Align vertical pit mounted pump assembly after mounting and securing cover plate.

3.3 FIELD QUALITY CONTROL

- .1 Site Tests/Inspection:
 - .1 Check power supply.
 - .2 Check starter protective devices.
- .2 Start-up, check for proper and safe operation.
- .3 Check settings and operation of hand-off-auto selector switch, operating, safety and limit controls, audible and visual alarms, over-temperature and other protective devices.
- .4 Adjust flow from water-cooled bearings.
- .5 Adjust impeller shaft stuffing boxes, packing glands.

3.4 START-UP

- .1 General:
 - .1 Procedures:
 - .1 Check power supply.
 - .2 Check starter O/L heater sizes.
 - .3 Start pumps, check impeller rotation.
 - .4 Check for safe and proper operation.
 - .5 Check settings, operation of operating, limit, safety controls, over-temperature, audible/visual alarms, other protective devices.
 - .6 Test operation of hands-on-auto switch.
 - .7 Test operation of alternator.
 - .8 If applicable:
 - .1 Adjust leakage through water-cooled bearings.
 - .2 Adjust shaft stuffing boxes.
 - .3 Adjust leakage flow rate from pump shaft stuffing boxes to manufacturer's recommendations.
 - .4 Check base for free-floating, no obstructions under base.
 - .5 Check installation, operation of mechanical seals, packing gland type seals. Adjust as necessary.
 - .6 Adjust alignment of piping and conduit to ensure full flexibility.

- .7 Eliminate causes of cavitation, flashing, air entrainment.
- .8 Measure pressure drop across strainer when clean and with flow rates as finally set.
- .9 Replace seals if pump used to degrease system or if pump used for temporary heat.
- .10 Verify lubricating oil levels.

3.5 PV - STORM WATER PUMPS

- .1 Application tolerances:
 - .1 Flow: plus 10%; minus 0%.
- .2 PV Procedures:
 - .1 Fill sump at rate slower than capacity of pump #1.
 - .2 Record levels at which pump #1 starts and stops. Determine flow rate by observing time taken to down water level.
 - .3 Fill sump at rate faster than capacity of pump #1 but slower than capacities of pumps #1 and #2 operating in parallel.
 - .4 Record levels at which pumps start and stop - water level rising and water level falling.
 - .5 Verify operation of alternator.
 - .6 Adjust water level controls as necessary.
 - .7 Fill sump at rate faster than capacities of pumps #1 and #2 operating in parallel.
 - .8 Record levels at pump starts and stops - water level rising and falling.
 - .9 Check operation of alternator.
 - .10 Adjust level controls as necessary.
 - .11 Check level at which high water level alarm starts and stops. Adjust as necessary.
- .3 Check removability of pumps for servicing without interfering with installation or operation of other equipment.
- .4 Verify non-clog capability and maximum size of solids, using procedures recommended by manufacturer.

3.6 REPORTS

- .1 Include:
 - .1 PV results on approved PV Report Forms.
 - .2 Product Information report forms.
 - .3 Pump performance curves (family of curves) with final point of actual performance.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM International Inc.
 - .1 ASTM D2235-04(R2009), Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
 - .2 ASTM D2564-04(R2009), Standard Specification for Solvent Cements for Poly(Vinyl-Chloride) (PVC) Plastic Piping Systems.
 - .3 ASTM A312/A312M-12, Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
 - .4 ASTM A403/A403M-11, Wrought Austenitic Stainless Steel Piping Fittings
- .2 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-Series B1800-11, Thermoplastic Nonpressure Pipe Compendium - B1800 Series.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature and datasheets for piping and adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
- .3 Store at temperatures and conditions recommended by manufacturer.

Part 2 Products

2.1 PVC PIPING AND FITTINGS

- .1 Piping and Fittings: Schedule 80
- .2 Butterfly Valve:
 - .1 Body Type: wafer
 - .2 Body Material: PVC
 - .3 Disc: PVC
 - .4 Seat: EPDM
- .3 Check Valve:

- .1 Body Type: wafer
- .2 Body Material: PVC
- .3 Disc: PVC
- .4 Disc Spring: 316SS
- .5 Seat: EPDM

2.2 JOINTS

- .1 Solvent weld for PVC: to ASTM D2564.
- .2 Solvent weld for ABS: to ASTM D2235.

2.3 STAINLESS STEEL PIPING

- .1 Stainless steel pipe: to ASTM A312, Grade TP316L, as follows:
 - .1 To 100mm: Schedule 40S.
- .2 Pipe joints:
 - .1 100mm and over: welding fittings and flanges to ASTM A182, Grade F316L, bore to match pipe.
 - .2 Flanges: plain or raised face, weld neck.
 - .3 Flange gaskets: Teflon, 1.5 mm thick, ring type for RF flanges.
 - .4 Bolts and nuts: to ASTM A193, Grade B5 and ASTM A194 Grade 2H.
- .3 Fittings:
 - .1 Welded fittings: to ASTM A403, Grade TP316L

Part 3 Execution

3.1 APPLICATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

- .1 In accordance with Section 23 05 05 – Piping and Fittings.
- .2 Install in accordance with Provincial Plumbing Code.

3.3 TESTING

- .1 Hydraulically test to verify grades and freedom from obstructions.

3.4 PERFORMANCE VERIFICATION

- .1 Cleanouts:
 - .1 Ensure accessible and that access doors are correctly located.
 - .2 Open, cover with linseed oil and re-seal.
 - .3 Verify cleanout rods can probe as far as the next cleanout, at least.
- .2 Test to ensure traps are fully and permanently primed.

- .3 Storm water drainage:
 - .1 Verify domes are secure.
 - .2 Ensure weirs are correctly sized and installed correctly.
 - .3 Verify provisions for movement of roof system.
- .4 Ensure fixtures are properly anchored, connected to system and effectively vented.
- .5 Affix applicable label (storm, sanitary, vent, pump discharge) c/w directional arrows every floor or 4.5 m (whichever is less).

3.5 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION