

**Part 1        General**

**1.1        RELATED REQUIREMENTS**

- .1        NOT USED

**1.2        REFERENCE STANDARDS**

- .1        NOT USED.

**1.3        ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Submit in accordance with Section 01 33 00 - Submittal Procedures
- .2        Product Data:
  - .1        Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.
- .3        Shop Drawings:
  - .1        Submit drawings to Departmental Representative for review and approval for the following items:
    - .1        Pumps
    - .2        Pits (including covers, float assemblies, and rails)
    - .3        Pump Control Panels
    - .4        Pipe Saddles, Couplings, and Specialty Fittings
    - .5        Pipe mounts and supports
  - .2        Indicate on drawings:
    - .1        Mounting arrangements.
    - .2        Operating and maintenance clearances.
  - .3        Shop drawings and product data accompanied by:
    - .1        Detailed drawings of bases, supports, and anchor bolts.
    - .2        Acoustical sound power data, where applicable.
    - .3        Points of operation on performance curves.
    - .4        Manufacturer to certify current model production.
    - .5        Certification of compliance to applicable codes.

**1.4        CLOSEOUT SUBMITTALS**

- .1        Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2        Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.
  - .1        Operation and maintenance manual approved by, and final copies deposited with, Departmental Representative before final inspection.

- .2 Operation data to include:
  - .1 Control schematics .
  - .2 Description of systems and their controls.
  - .3 Description of operation of systems at various loads together with reset schedules and seasonal variances.
  - .4 Operation instruction for systems and component.
  - .5 Description of actions to be taken in event of equipment failure.
  - .6 Valves schedule and flow diagram.
  - .7 Colour coding chart.
- .3 Maintenance data to include:
  - .1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.
  - .2 Data to include schedules of tasks, frequency, tools required and task time.
- .4 Performance data to include:
  - .1 Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.
  - .2 Equipment performance verification test results.
  - .3 Special performance data as specified.
  - .4 Testing, adjusting and balancing reports

## **1.5 MAINTENANCE MATERIAL SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals
- .2 Furnish spare parts as follows:
  - .1 One set of packing for each pump.
  - .2 One casing joint gasket for each size pump.
  - .3 One glass for each gauge glass.
- .3 Provide one set of special tools required to service equipment as recommended by manufacturers.
- .4 Furnish one commercial quality grease gun, grease and adapters to suit different types of grease and grease fittings.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:

- .1 Store materials off ground in dry location indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect from nicks, scratches, and blemishes
- .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section

## **Part 2 Products**

- 2.1 Refer to individual sections in Division 22.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative

### **3.2 PAINTING REPAIRS AND RESTORATION**

- .1 Restore to new condition, finishes which have been damaged.

### **3.3 SYSTEM CLEANING**

- .1 NOT USED

### **3.4 DEMONSTRATION**

- .1 Departmental Representative will use equipment and systems for test purposes prior to acceptance. Supply labour, material, and instruments required for testing.
- .2 Use operation and maintenance manual, as-built drawings, and audio visual aids as part of instruction materials.
- .3 Instruction duration time requirements as specified in appropriate sections.
- .4 Departmental Representative will record these demonstrations on video tape for future reference.

### **3.5 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning

- .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning

### **3.6 PROTECTION**

- .1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

**END OF SECTION**

**Part 1        General**

**1.1            RELATED REQUIREMENTS**

- .1        NOT USED.

**1.2            REFERENCE STANDARDS**

- .1        ASTM International Inc.
  - .1        ASTM D2564, Standard Specification for Solvent Cements for Poly(Vinyl-Chloride) (PVC) Plastic Piping Systems.
- .2        Canadian Standards Association (CSA International)
  - .1        CAN/CSA-Series B1800-2015, Thermoplastic Nonpressure Pipe Compendium - B1800 Series.
- .3        Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1        Material Safety Data Sheets (MSDS).
- .4        National Research Council Canada (NRC)
  - .1        National Plumbing Code of Canada 2015 (NPC).

**1.3            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.

**1.4            DELIVERY, STORAGE AND HANDLING**

- .1        Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
- .2        Store at temperatures and conditions recommended by manufacturer.

**Part 2        Products**

**2.1            MATERIAL**

- .1        Adhesives and Sealants: in accordance with Section 07 92 00 - Joint Sealants.
  - .1        Low VOC

**2.2            PIPING AND FITTINGS**

- .1        Buried and above ground sanitary, storm, and vent piping to:

- .1 CAN/CSA B1800.
- .2 Schedule 80 PVC

- .2 Fabricated Cast Iron Tapping Saddle
  - .1 Cast Iron
  - .2 Track head bolts, heavy hex nuts, high strength
  - .3 Gaskets: SBR per ASTM D 2000 MBA 700

## **2.3 JOINTS**

- .1 Solvent weld for PVC: to ASTM D2564.

## **2.4 FITTINGS**

- .1 PVC To Existing Cast Iron, Underground:
  - .1 Elastomeric polyvinyl chloride (PVC) coupling with stainless steel clamp: to ASTM D5926 and ASTM C1173.
- .2 PVC To Existing Copper, Aboveground:
  - .1 Elastomeric polyvinyl chloride (PVC) coupling with stainless steel clamp: to ASTM D5926 and ASTM C1173.

## **2.5 VALVES**

- .1 Ball valves
- .2 Schedule 80 PVC
- .3 ASTM F1970, NSF/ANSI Standard 14, NSF/ANSI Standard 61

## **2.6 UNIONS**

- .1 Schedule 80 PVC
- .2 ASTM F1970, NSF/ANSI Standard 14, NSF/ANSI Standard 61

## **2.7 CHECK VALVES**

- .1 Ball check valves
- .2 Schedule 80 PVC
- .3 ASTM F1970, NSF/ANSI Standard 14, NSF/ANSI Standard 61

## **2.8 MOUNTING / SUPPORTS**

Submit mounting / support hardware shop drawings to Departmental Representative for review and approval prior to procurement or installation.

- .1 Wall Mount:
  - .1 J-hook clamp style steel pipe hangers.

- .1 Fasten to wall using 9.5 mm diameter concrete anchor bolts.
- .2 Floor Mount:
  - .1 Steel saddle pipe mount with U-Bolt, 22mm diameter steel threaded support rod, and steel mounting flange.
    - .1 Fasten mounting flange to floor using 9.5mm diameter carbon steel screw anchors.
- .3 Ceiling Mount:
  - .1 Steel band style hanger, with 13mm diameter steel threaded support rod, and 13mm diameter drop-in anchors.
- .4 Refer to drawing for mounting details and support requirements.

### **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 Pipes: Install in accordance with Provincial Plumbing Code and National Plumbing Code.
- .2 Pipe Mounts:
  - .1 Install in accordance with detail provided on drawings.
    - .1 Attachments for concrete: as noted in Part 2.
  - .2 Drill holes with rotary impact hammer drills using carbide-tipped bits. Drill bits shall be of diameters as specified by the anchor manufacturer. Unless otherwise shown on the Drawings, all holes shall be drilled perpendicular to the concrete surface.
    - .1 Embedded Items: Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Exercise care in coring or drilling to avoid damaging existing reinforcing or embedded items. Notify the Departmental Representative if reinforcing steel or other embedded items are encountered during drilling. Take precautions as necessary to avoid damaging prestressing tendons.
  - .3 Perform anchor installation in accordance with manufacturer instructions.
  - .4 Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in part to be fastened. Set anchors to manufacturer's recommended torque, using a torque wrench. Following attainment of 10% of the specified torque, 100% of the specified torque shall be reached within 7 or fewer complete turns of the nut. If the specified torque is not achieved within the required number of turns, the anchor

shall be removed and replaced unless otherwise directed by the Departmental Representative.

- .5 Remove and replace misplaced or malfunctioning anchors. Fill empty anchor holes and patch failed anchor locations with high-strength non-shrink, nonmetallic grout. Anchors that fail to meet proof load or installation torque requirements shall be regarded as malfunctioning.

### **3.3 TESTING**

- .1 Pressure test buried systems before backfilling.
- .2 Hydraulically test to verify grades and freedom from obstructions.

### **3.4 PERFORMANCE VERIFICATION**

- .1 Test to ensure traps are fully and permanently primed.
- .2 Ensure fixtures are properly anchored, connected to system and effectively vented.
- .3 Affix applicable label (storm, sanitary, vent, pump discharge) c/w directional arrows every 4.5 m.

### **3.5 CLEANING**

- .1 Clean in accordance with Section 01 74 11 - Cleaning
  - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**END OF SECTION**