

**Part 1 General**

**1.1 GENERAL REQUIREMENTS**

- .1 The Contractor shall be responsible to carry out all the Work set out or referred to in this Section 22 42 01.

**1.2 SUMMARY**

- .1 Section Includes:
  - .1 Materials and installation for plumbing specialties and accessories.
  - .2 Sustainable requirements for construction and verification.
- .2 Related Sections:
  - .1 Division 01 – General Requirements.

**1.3 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM):
  - .1 ASTM A126-95 (2001), Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
  - .2 ASTM B62-02, Specification for Composition Bronze or Ounce Metal Castings.
- .2 American Water Works Association (AWWA):
  - .1 AWWA C700-02, Cold Water Meters-Displacement Type, Bronze Main Case.
  - .2 AWWA C701-02, Cold Water Meters-Turbine Type for Customer Service.
  - .3 AWWA C702-1-01, Cold Water Meters-Compound Type.
- .3 Canadian Standards Association (CSA International):
  - .1 CSA-B64 Series-01, Backflow Preventers and Vacuum Breakers.
  - .2 CSA-B79-94 (R2000), Floor, Area and Shower Drains, and Cleanouts for Residential Construction.
  - .3 CSA-B356-00, Water Pressure Reducing Valves for Domestic Water Supply Systems.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS):
  - .1 Material Safety Data Sheets (MSDS).
- .5 Plumbing and Drainage Institute (PDI):
  - .1 PDI-G101-96, Testing and Rating Procedure for Grease Interceptors with Appendix of Sizing and Installation Data.
  - .2 PDI-WH201-92, Water Hammer Arresters Standard.

**1.4 SUBMITTALS**

- .1 Submittals in accordance with Division 01 – General Requirements.
- .2 Co-ordinate submittal requirements and provide submittals required by Division 01 – General Requirements.

- .3 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet for fixtures and equipment.
  - .2 Indicate dimensions, construction details and materials for specified items.
  - .3 Submit WHMIS MSDS in accordance with Division 01 – General Requirements. Indicate VOC's for adhesive and solvents during application and curing.
- .4 Shop Drawings:
  - .1 Submit shop drawings to indicate materials, finishes, method of anchorage, number of anchors, dimensions construction and assembly details and accessories for following: soap dispensing system.
- .5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .6 Instructions: submit manufacturer's installation instructions.
- .7 Manufacturers' Field Reports: manufacturers' field reports specified.
- .8 Closeout submittals: submit maintenance and engineering data for incorporation into manual as specified in Division 01 – General Requirements, include:
  - .1 Description of plumbing specialties and accessories, giving manufacturers name, type, model, year and capacity.
  - .2 Details of operation, servicing and maintenance.
  - .3 Recommended spare parts list.

## **1.5 QUALITY ASSURANCE**

- .1 Health and Safety:
  - .1 Do construction occupational health and safety in accordance Division 01 – General Requirements.
- .2 Construction requirements: in accordance with Division 01 – General Requirements.
- .3 Verification: contractor's verification in accordance with Division 01 – General Requirements.

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

- .1 Store and manage hazardous materials in accordance with Division 01 – General Requirements.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with Division 01 – General Requirements.
  - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility.
- .5 Fold up metal and plastic banding, flatten and place in designated area for recycling.

## **Part 2 Products**

**General Note: All components used for the domestic water systems shall be lead-free.**

### **2.1 MATERIALS**

- .1 Materials and resources in accordance with Division 01 – General Requirements.

### **2.2 FLOOR DRAINS**

- .1 Floor drains and trench drains: to CSA B79 materials and resources in accordance with Division 01 – General Requirements.
- .2 Materials and resources in accordance with Division 01 – General Requirements.
- .3 Refer to plumbing schedule on drawings for performance, size and other information

### **2.3 CLEANOUTS**

- .1 Line Cleanouts: heavy cast iron pipe with taper thread cover secured to body with full size pipe opening.
- .2 Stack Cleanout: In base of cast iron stacks with neoprene gasketted secured cover. Where cleanouts are concealed behind finished walls access to be made by round stainless steel plate and slotted flat head screws.
- .3 Floor Cleanouts:
  - .1 In unfinished areas and outside areas, Duco coated cast iron body with integral clamp device and removable positive seal closure plug and heavy duty 150mm diameter adjustable cover secured with stainless steel screws. And C.O. cast in cover for waterproof areas provide ‘flange with flashing clamp.
  - .2 In tiled areas same as above with square nickel bronze cover and frame recessed for tile. Cover to be adjustable to suit floor lines when installing in finished floor.
  - .3 Finished areas: same as above with nickel bronze frame and cover for medium traffic load.
  - .4 For heavy traffic areas: same as above with extra heavy nickel bronze cover and frame.

## **2.4 WATER HAMMER ARRESTORS**

- .1 Brass piston in a type K copper casing sized in accordance with manufacturer's recommendations to eliminate water hammer and shock from piping systems. Provide on hot and cold water lines to all quick valves, solenoids and locate horizontally at the end of line closest to supply source.

## **2.5 BACK FLOW PREVENTERS**

- .1 Preventers: to CSA-B64 Series, application as indicated reduced pressure principle type or double check valve assembly back flow preventer with intermediate atmospheric vent or vacuum breaker.
- .2 Acceptable Manufacturer:
  - .1 Appliance Backflow Preventer:
    - .1 RP Type: Reduced Pressure Principle.
    - .2 PVB Type: Pressure Vacuum Breaker.

## **2.6 VACUUM BREAKERS**

- .1 Breakers: to CSA-B64 Series, vacuum breaker atmospheric, hose connection.

## **2.7 PRESSURE VACUUM BREAKERS**

- .1 Lead Free, Anti-siphon, spill resistant pressure vacuum breaker.
- .2 Certified to NSF/ANSI 61.
- .3 Full port ball valves.
- .4 Low lead bronze (ASTM B 584) with integrated modular check and float assembly made from thermoplastics.
- .5 Stainless steel spring.
- .6 The valve shall incorporate a diaphragm to separate the air inlet from the potable water supply preventing spillage.

## **2.8 PRESSURE REGULATORS**

- .1 Capacity: as indicated:
  - .1 Inlet pressure: to 100 psi.
  - .2 Outlet pressure: 45 psi.
- .2 Up to NPS1-1/2 bronze bodies, screwed: to ASTM B62.
- .3 NPS2 and over, semi-steel bodies, Class 125, flanged: to ASTM A126, Class B.
- .4 Semi-steel spring chambers with bronze trim.

## **2.9 STRAINERS**

- .1 860 kPa, Y type with 20 mesh, Monel, bronze or stainless steel removable screen.
- .2 NPS2 and under, bronze body, screwed ends, with brass cap.

## **2.10 CIRCUIT BALANCING VALVE (NPS ½" – 2" VALVE)**

- .1 Valves are to be of the 'Y' pattern, equal percentage globe-style and provide three functions: 1) Precise flow measurement, 2) Precision flow balancing, 3) Positive drip-tight shut-off.
- .2 Valve shall be design for potable water.
- .3 Valve shall provide multi-turn, 360° adjustment with micrometer type indicators located on the valve Hand wheel. Valves shall have a minimum of five full 360° hand wheel turns.
- .4 Valve handle shall have hidden memory feature, which will provide a means for locking the valve position after the system is balanced.
- .5 Valves shall be furnished with precision machined Venturi built into the valve body to provide highly accurate flow measurement and flow balancing. The Venturi shall have two, 25 mm (1/4") threaded brass metering ports with check valves and gasketed caps located on the inlet side of the valve.
- .6 Valves shall be furnished with flow smoothing fins downstream of the valve seat and integral to the forged valve body to make the flow more laminar. The valve body, stem and plug shall be brass.
- .7 The hand wheel shall be high-strength resin.

## **2.11 TRAP SEAL PRIMERS**

- .1 Refer to plumbing schedule on drawings for performance, size and other information.
- .2 Install where indicated on drawings.

## **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 Install in accordance with National Plumbing Code of Canada, Provincial Codes and local authority having jurisdiction.
- .2 Install in accordance with manufacturer's instructions and as specified.

- .3 Where components are accessible, install with vandal proof screws.

### **3.3 CLEANOUTS**

- .1 Install cleanouts at base of soil and waste stacks, at locations required, by code, and as indicated.
- .2 Bring cleanouts to wall or finished floor unless serviceable from below floor.
- .3 Building drain cleanout and stack base cleanouts: line size to maximum NPS4.

### **3.4 WATER HAMMER ARRESTORS**

- .1 Install on branch supplies to fixtures or group of fixtures, all flush valves, mop sinks, downstream of all fixtures fed with solenoid, all equipment (re-processors and washers) and elsewhere where indicated.

### **3.5 BACK FLOW PREVENTERS**

- .1 Install in accordance with CSA-B64 Series, where indicated and elsewhere as required by code.
- .2 Pipe discharge to terminate over nearest drain or service sink (above p-trap) as indicated on drawing.
- .3 All backflow preventers to be accessible. Do not install in ceiling space. Install with center line height between 750 mm and 1500 mm above floor.

### **3.6 TRAP SEAL PRIMERS**

- .1 Install for floor drains and elsewhere, as indicated.
- .2 Install on cold water.
- .3 Install soft copper tubing to floor drain.
- .4 Trap primer shall be controlled by the BMS. Plumbing contractor shall coordinate with the controls contractor.

### **3.7 STRAINERS**

- .1 Install with sufficient room to remove basket.

### **3.8 CIRCUIT BALANCING VALVE (NPS ½" – 2" VALVE)**

- .1 Install circuit balancing valve as per manufacturer's recommendation where indicated on the plans and where required for flow balancing (including trap seal primers).

### **3.9 START-UP**

- .1 General:
  - .1 In accordance with Division 01 – General Requirements.
- .2 Timing: start-up only after:
  - .1 Pressure tests have been completed.

- .2 Disinfection procedures have been completed.
- .3 Certificate of static completion has been issued.
- .4 Water treatment systems operational.
- .3 Provide continuous supervision during start-up.

### **3.10 FIELD QUALITY CONTROL**

- .1 Verification requirements in accordance with Division 01 – General Requirements, include:
  - .1 Materials and resources.
  - .2 Storage and collection of recyclables.
  - .3 Construction waste management.
  - .4 Resource reuse.
  - .5 Recycled content.
  - .6 Local/regional materials.
  - .7 Wood.
  - .8 Low-emitting materials.

### **3.11 TESTING AND ADJUSTING**

- .1 General:
  - .1 In accordance with Division 01 – General Requirements.
- .2 Timing:
  - .1 After start-up deficiencies rectified.
  - .2 After certificate of completion has been issued by authority having jurisdiction.
- .3 Application tolerances:
  - .1 Pressure at fixtures: +/- 70 kPa.
  - .2 Flow rate at fixtures: +/- 20%.
- .4 Adjustments:
  - .1 Verify that flow rate and pressure meet design criteria.
  - .2 Make adjustments while flow rate or withdrawal is (1) maximum and (2) 25% of maximum and while pressure is (1) maximum and (2) minimum.
- .5 Floor drains:
  - .1 Verify operation of trap seal primer.
  - .2 Prime, using trap primer. Adjust flow rate to suit site conditions.
  - .3 Check operations of flushing features.
  - .4 Check security, accessibility, removability of strainer.
  - .5 Clean out baskets.
- .6 Vacuum breakers:
  - .1 Test tightness, accessibility for O&M of cover and of valve.

- .2 Simulate reverse flow and back-pressure conditions to test operation of vacuum breakers.
- .3 Verify visibility of discharge from open ports.
- .7 Access doors:
  - .1 Verify size and location relative to items to be accessed.
- .8 Cleanouts:
  - .1 Verify covers are gas-tight, secure, yet readily removable.
- .9 Water hammer arrestors:
  - .1 Verify proper installation of correct type of water hammer arrester.
- .10 Pressure regulators, PRV assemblies:
  - .1 Adjust settings to suit locations, flow rates, pressure conditions.
- .11 Strainers:
  - .1 Clean out repeatedly until clear.
  - .2 Verify accessibility of cleanout plug and basket.
  - .3 Verify that cleanout plug does not leak.
- .12 Commissioning Reports:
  - .1 In accordance with Division 01 – General Requirements.
- .13 Training:
  - .1 In accordance with Section 21 05 01 – Common Work Results For Mechanical.

END OF SECTION