

1. GENERAL**1.1 References**

- .1 ASTM International
 - .1 ASTM A126-04(2009), Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
 - .2 ASTM B62-09, Standard Specification for Composition Bronze or Ounce Metal Castings.
- .2 American Water Works Association (AWWA)
 - .1 ANSI/AWWA C700-09, Standard for Cold Water Meters-Displacement Type, Bronze Main Case.
 - .2 ANSI/AWWA C702-10, Standard for Cold Water Meters-Compound Type.
- .3 CSA International
 - .1 CSA-B64 Series-11, Backflow Preventers and Vacuum Breakers.
 - .2 CSA B79-08, Commercial and Residential Drains and Cleanouts.
 - .3 CAN/CSA-B356-10, Water Pressure Reducing Valves for Domestic Water Supply Systems.
- .4 Efficiency Valuation Organization (EVO)
 - .1 International Performance Measurement and Verification Protocol (IPMVP).
 - .1 IPMVP 2007 Version.
- .5 Plumbing and Drainage Institute (PDI)
 - .1 PDI-G101-R2010, Testing and Rating Procedure for Grease Interceptors with Appendix of Installation and Maintenance.
 - .2 PDI-WH201-R2010, Water Hammer Arresters Standard.

1.2 Administrative Requirements

- .1 Pre-installation Meetings:
 - .1 Convene pre-installation meeting 1 week prior to beginning work of this Section, with Departmental Representative in accordance with Section 01 31 19 - Project Meetings to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building construction subtrades.
 - .4 Review manufacturer's written installation instructions and warranty requirements.

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 for plumbing products and include product characteristics, performance criteria, physical size, finish and limitations.

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- .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures. Indicate VOC's:
 - .3 Shop Drawings:
 - .1 Indicate on drawings to indicate materials, finishes, method of anchorage, number of anchors, dimensions, construction and assembly details, accessories for all mechanical equipment.
 - .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.
- 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 plumbing specialties and accessories for incorporation into manual.
 - .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 **Delivery, Storage and Handling**
- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and 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, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect plumbing materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
2. **PRODUCTS**
- 2.1 **Floor Drains**
- .1 Floor Drains: to CSA B79.
 - .2 Type 1: general duty; cast iron body or as indicated, adjustable head, sediment basket, nickel bronze strainer, integral seepage pan, trap seal primer tapping, and clamping collar.

- .3 Type 2: heavy duty; cast iron body, heavy duty non-tilting or hinged lacquered cast iron grate, integral seepage pan, trap seal primer tapping and clamping collar.

2.2 Cleanouts

- .1 Cleanout Plugs: heavy cast iron male ferrule with brass screws and threaded brass or bronze plug. Sealing-caulked lead seat or neoprene gasket.
- .2 Access Covers:
 - .1 Wall Access: face or wall type, polished nickel bronze or stainless steel, square or round cover with flush head securing screws, bevelled edge frame complete with anchoring lugs.
 - .2 Floor Access: rectangular or round, cast iron body and frame with adjustable secured nickel bronze top or cast box with anchor lugs and:
 - .1 Plugs: bolted bronze with neoprene gasket.
 - .2 Cover for Unfinished Concrete Floors: cast iron, nickel bronze, round or square, gasket, vandal-proof screws.
 - .3 Cover for Terrazzo Finish: polished nickel bronze or brass with recessed cover for filling with terrazzo, vandal-proof locking screws.
 - .4 Cover for Tile and Linoleum Floors: polished nickel bronze with recessed cover for linoleum or tile infill, complete with vandal-proof locking screws.
 - .5 Cover for Carpeted Floors: polished nickel bronze with deep flange cover for carpet infill, complete with carpet retainer vandal-proof locking screws.

2.3 Trap Seal Primers

- .1 Brass, with integral vacuum breaker, NPS 1/2 solder ends, NPS 1/2 drip line connection.

2.4 Water Hammer Arrestors

- .1 Stainless steel construction, bellows type: to PDI-WH201.

2.5 Back Flow Preventers BFP-1 (water entry), BFP-2 (Fire water) and BFP-3 (hot domestic water)

- .1 Preventers: to CSA-B64 Series, application as indicated, reduced pressure principle type double check valve assembly back flow preventer with intermediate vacuum breaker.

2.6 Vacuum Breakers

- .1 Breakers: to CSA-B64 Series, vacuum breaker atmospheric, hose connection and laboratory faucet intermediate.



2.7 Pressure Regulator (PR-1)

- .1 Capacity: as indicated.
 - .1 Inlet pressure: 1034 kPa.
 - .2 Outlet pressure: 413 kPa.
- .2 Up to NPS 1-1/2 bronze bodies, screwed: to ASTM B62.

.3 NPS 2 and over, semi-steel bodies, Class 125, flanged: to ASTM A126, Class B.

.4 Semi-steel spring chambers with bronze trim.

2.8 Backwater Valves

.1 Coated extra heavy cast iron body with bronze seat, revolving bronze flapper and threaded cover.

.2 Access:

- .1 Surface access.
- .2 Access pipe with cover: maximum 300 mm depth.
- .3 Steel housing with gasketed steel cover.
- .4 Concrete access pit with cover, as indicated.

2.9 Water Make-up Assembly

.1 Complete with backflow preventer pressure gauge on inlet and outlet, pressure reducing valve to CAN/CSA-B356, pressure relief valve on low pressure side and gate valves on inlet and outlet.

2.10 Water Meters

- .1 Displacement type to ANSI/AWWA C700,
- .2 Compound type to ANSI/AWWA C702.
- .3 Capacity: as indicated.
- .4 Accessories: remote readout device compatible with EMCS network

2.11 Strainers

- .1 860 kPa, Y type with 20 mesh, monel, bronze or stainless steel removable screen.
- .2 NPS 2 and under, bronze body, screwed ends, with brass cap.
- .3 NPS 2 1/2 and over, cast iron body, flanged ends, with bolted cap.

2.12 Thermostatic Mixing Valve

- .1 Type MXV-1
 - .1 Bronze thermostatic mixing valve.
 - .2 Stainless steel recessed cabinet
 - .3 Compensating for temperature and pressure variations.
 - .4 Adjustable temperature.
 - .5 Locking temperature regulator to prevent accidental movement set for 29°C.
 - .6 Cold water by-pass capable of 15 l/min @ 2.1 Bar upon failure of hot water.
 - .7 Valve close down on failure of cold water.
 - .8 High temperature limit stop.
 - .9 Dial thermometer
 - .10 Hot water temperature supply : 60°C.

- .11 Capacity : 1.9 to 38 L/min.
- .12 In accordance with ANSI Z358.1 requirements.

3. EXECUTION

3.1 Examination

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for plumbing specialties and accessories 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 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.

3.3 Installation

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

3.4 Cleanouts

- .1 Install cleanouts at base of soil and waste stacks, and rainwater leaders, at locations required 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 NPS 4.

3.5 Trap Seal Primers

- .1 Install on all floor drains and emergency showers.
- .2 Install on cold water supply to nearest frequently used plumbing fixture, in concealed space, to approval of Departmental Representative.
- .3 Do not install on emergency cold water (ECW).
- .4 Install soft copper, tubing to floor drain.

3.6 Water Hammer Arrestors

- .1 Install on branch supplies to fixtures or group of fixtures or where indicated.

3.7 Back Flow Preventers

- .1 Install in accordance with CSA-B64 Series, where indicated and elsewhere as required by code.
 - .1 Drains.
 - .2 Backwater Valves.
 - .3 Water Make-up Assembly.
 - .4 Grease Interceptors.
- .2 Pipe discharge to terminate over nearest floor drain.

3.8 Backwater Valves

- .1 Install in main sewer lines where indicated and at weeping tile connection in pit provided at building cleanout.
- .2 Install in access pit as indicated.

3.9 Hose Bibbs and Sediment Faucets

- .1 Install at bottom of risers, at low points to drain systems, and as indicated.

3.10 Strainers

- .1 Install with sufficient room to remove basket for maintenance.

3.11 Water Meters

- .1 Install water meter provided by local water authority.
- .2 Install water meters as indicated.

3.12 Water Make-up Assembly

- .1 Install on valved bypass.
- .2 Pipe discharge from relief valve to nearest floor drain.

3.13 Start-up

- .1 General:
 - .1 In accordance with Section 01 91 13 - General Commissioning (Cx) Requirements: General Requirements, supplemented as specified herein.
- .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.

3.14 Testing and Adjusting

- .1 General:
 - .1 Test and adjust plumbing specialties and accessories in accordance with Section 01 91 13- General Commissioning (Cx) Requirements: General Requirements, supplemented as specified.
- .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, backflow preventers, backwater valves:
 - .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, backflow preventers.
 - .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 Wall hydrants:
 - .1 Verify complete drainage, freeze protection.
 - .2 Verify operation of vacuum breakers.

- .11 Pressure regulators, PRV assemblies:
 - .1 Adjust settings to suit locations, flow rates, pressure conditions.
- .12 Strainers:
 - .1 Clean out repeatedly until clear.
 - .2 Verify accessibility of cleanout plug and basket.
 - .3 Verify that cleanout plug does not leak.
- .13 Hose bibbs, sediment faucets:
 - .1 Verify that flow and pressure meet design criteria.
 - .2 Check for leaks, replace compression washer if required.
- .14 Hydronic system water Make-up Assembly:
 - .1 Verify flow, pressure, and connection.
- .15 Water meters:
 - .1 Verify location and accessibility.
 - .2 Test meter reading accuracy.

3.15 Closeout Activities

- .1 Commissioning Reports: in accordance with Section 01 91 13 - General Commissioning (Cx)
Requirements: reports, supplemented as specified.
- .2 Training: provide training in accordance with Section 01 91 13 - General Commissioning (Cx)
Requirements: Training of O&M Personnel, supplemented as specified.

3.16 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.

3.17 Protection

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by plumbing specialties and accessories installation.

End of Section