## PART 1 - GENERAL

### 1.1 REFERENCES

.1 ASTM International
- .1 ASTM A 126-04(2009), Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
- .2 ASTM B 62-09, 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 C701-12, Standard for Cold Water Meters-Turbine Type for Customer Service.
- .3 ANSI/AWWA C702-10, Standard for Cold Water Meters-Compound Type.

.3 Canada Green Building Council (CaGBC)
- .1 LEED Canada 2009 for Design and Construction-2010, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.

.4 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.

.5 Efficiency Valuation Organization (EVO)
- .1 International Performance Measurement and Verification Protocol (IPMVP).
  - .1 IPMVP 2007 Version.

.6 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 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.
.2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements. Indicate VOC's:

.3 Shop Drawings:
.1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Newfoundland and Labrador, Canada.
.2 Indicate on drawings to indicate materials, finishes, method of anchorage, number of anchors, dimensions, construction and assembly details and accessories for following: soap dispensing system.

.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 Sustainable Design Submittals:
.1 LEED Canada submittals: in accordance with Section 01 35 21 - LEED Requirements.
.2 Construction Waste Management:
.1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
.2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.
.3 Recycled Content:
.1 Submit listing of recycled content products used, including details of

1.2 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

.7 Sustainable Design Submittals: (Cont'd)

.3 Recycled Content: (Cont'd)

.1 (Cont'd)

required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.

.4 Regional Materials: submit evidence that project incorporates required percentage 30% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.

1.3 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.

1.4 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 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.

1.4 DELIVERY, STORAGE AND HANDLING (Cont'd)

.3 Storage and Handling Requirements: (Cont'd)
.3 Replace defective or damaged materials with new.

.4 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 35 21 - LEED Requirements.

.5 Packaging Waste Management: remove for reuse or return of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 01 35 21 - LEED Requirements.

PART 2 - PRODUCTS

2.1 FLOOR DRAINS

.1 Floor Drains and Trench Drains: to CSA B79. See schedule drawing for more details.

.2 FD-1: general duty; cast iron body round, adjustable head, nickel bronze strainer, integral seepage slots, and clamping collar, trap seal primer connection.

.3 FD-2: combination funnel floor drain; cast iron body with integral seepage slots, clamping collar, nickel-bronze adjustable head strainer with integral oval funnel.

.4 FD-3: genearl duty; cast iron body, integral seepage slots clamping collar, and adjustable strainer extension.

.5 FD-4: HDPE trench drain with heavy duty stainless steel grate, stainless steel extra heavy duty frame asembly, inside domed strainer, anchor flanges, membrane clamps.

2.2 ROOF DRAINS

.1 See plumbing fixture schedule drawing for more details.

.2 Type 1: controlled flow; 100 mm outlet; galvanized cast iron body, under deck clamp and sump receiver to suit roof construction, flashing clamp ring with integral gravel stop, bearing pan, flow control weir assembly, polyethylene dome.

2.3 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 round cover with flush head securing screws, bevelled edge frame complete with anchoring lugs.

.2 Floor Access: round cast iron body and frame with adjustable secured nickel bronze top and:

.1 Plugs: bolted bronze with neoprene gasket.

.2 Cover for Unfinished Concrete Floors: nickel bronze round gasket, vandal-proof screws.

.3 Cover for Tile and Linoleum Floors: polished nickel bronze with recessed cover for linoleum or tile infill, complete with vandal-proof locking screws.

2.4 NON-FREEZE WALL HYDRANTS

.1 Surface mount with integral vacuum breaker, NPS 3/4 hose outlet, removable operating key. Polished bronze finish.

2.5 WATER HAMMER ARRESTORS

.1 Copper construction, bellows or piston type: to PDI-WH201.

2.6 BACK FLOW PREVENTERS

.1 Preventers: to CSA-B64 Series, reduced pressure principle type, double check valve assembly. See detail for domestic water entrance for details.

2.7 VACUUM BREAKERS

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

2.8 PRESSURE REGULATORS

.1 Capacity:.
.1 Inlet pressure: 1034 kPa.
.2 Outlet pressure: 413 kPa.

.2 Up to NPS 1-1/2 bronze bodies, screwed: to ASTM B 62.

.3 NPS 2 and over, semi-steel bodies, Class 125, flanged: to ASTM A 126, Class B.

.4 Semi-steel spring chambers with bronze trim.

2.9 BACKWATER VALVES

.1 Galvanized 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 gasketted steel cover.
.4 Concrete access pit with cover, as indicated.

2.10 WATER METERS

.1 Displacement type to ANSI/AWWA C700, turbine type to AWWA C70, compound type to AWWA C702.

.2 Capacity: flow rate, pressure drop, pipe connections as indicated.

.3 Accessories: remote readout device.

2.11 TRAP SEAL PRIMERS

.1 Up to 12 floor draings: electronic trap priming manifold with:
- .1 Vacuum breaker.
- .2 Pre-set 24 hour time clock.
- .3 Manual override switch.
- .4 120 V solenoid valve.
- .5 120V or 3 wire connection.
- .6 NPS 3/4 inlet connection.
- .7 Calibrated manifold.
- .8 Water hammer arrestor.
- .9 Mounted in steel cabinet.
- .10 Compression outlet fittings.
- .11 Inlet shut off valve.
- .12 Supplies minimum 59 ml @138 kPa.

2.12 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.

2.13 COMBINATION EMERGENCY DRENCH SHOWER/EYEWASH UNIT (BARRIER FREE)

.1 Bowl: corrosion resistant stainless steel bowl.

.2 Shower head: 267 mm diameter corrosion resistant stainless steel shower head.

.3 Pipe and fittings: galvanized steel with protective yellow safety coating.

.4 Operation:
- .1 Shower and eyewash: bar to accomodate all users (including wheelchair accessibility)

.5 Pipe and Fittings: Schedule 40, stainless steel, complete with orange of yellow polyethylene cover on vertical piping for high visibility and corrosion resistance.

.6 Water supply: NPS 1.

.7 Waste: NPS 2.

2.13 COMBINATION EMERGENCY DRENCH SHOWER/EYEWASH UNIT (BARRIER FREE) (Cont'd)

.8 Shower valve: chrome-plated NPS 1 1/4 stay-open ball valve.

.9 Eyewash valve: chrome-plated NPS 1/2 stay-open ball valve.

.10 Eyewash spray head assembly: chrome-plated brass spray head assembly with twin, soft flow, eyewash heads and protective sprayhead covers. Integral flow control to ensure safe, steady flow under varying water supply conditions.

.11 Identification sign: 355 mm x 90 mm sign for wall mounting. Sign to read **"EMERGENCY DRENCH SHOWER/EYEWASH UNIT"**.

.12 Location: as indicated.

.13 Acceptable Product: HAWS Model 8356 WCC, Bradley, Guardian or approved equal.

2.14 EMERGENCY EYEWASH AND COMBINATION EMERGENCY DRENCH SHOWER/EYEWASH THERMOSTATIC MIXING VALVE

.1 To ANSI Z358.1.

.2 Liquid-filled thermal motor and piston control mechanism with positive shut-off of hot water when cold water supply is lost to prevent scalding.

.3 Valve shall allow cold water flow in the event of loss or interruption of the hot water supply or thermostatic failure.

.4 Vandal-resistant temperature adjustment.

.5 Rough bronze finish.

.6 Temperature range: 16°C to 35°C.

.7 Accuracy: ±1.67°C.

.8 Maximum operating pressure: 860 kPa.

.9 Maximum inlet temperature: 82°C.

.10 Provide complete with dial thermometer.

.11 Check stops on inlet of hot/cold.

2.14 EMERGENCY EYEWASH AND COMBINATION EMERGENCY DRENCH SHOWER/EYEWASH THERMOSTATIC MIXING VALVE (Cont'd)

.12 Provide complete with 18 gauge surface mounted stainless steel enclosure. Dimension of enclosure to be 610 mm high x 578 mm wide x 165 mm deep.

.13 Capacity: 117.3 L/min at 861 kPa operating pressure with a cold flow bypass capacity of 76 L/min at 207 kPa differential pressure.

.14 Application: emergency fixtures as indicated.

.15 Acceptable Product: HAWS 9201E, Bradley Powers, Guardian.

2.15 POTABLE WATER THERMAL EXPANSION TANK

.1 Quantity: as indicated.

.2 Application: absorb expanded water from domestic hot water tanks because of the inability to expand back into the Town potable water system due to the presence of a backflow preventer on the incoming water supply to the building.

.3 ASME Section VIII construction and label.

.4 FDA approved butyl bladder.

.5 1NPT stainless steel system connection.

.6 Standard tire air charging valve connection.

.7 1034 kPa maximum working pressure.

.8 Vertical tank, wall mounted.

.9 Dimensions: as indicated on drawings.

.10 Tank volume: as indicated on drawings.

.11 Acceptance volume: as indicated on drawings.

.12 Red primer exterior finish.

.13 Air pre-charge to be adjusted in field by the Mechanical Contractor to equal the residual cold water pressure on the discharge side of the pressure reducing valve on the domestic

2.15 POTABLE WATER THERMAL EXPANSION TANK (Cont'd)

.13 (Cont'd) water service entrance by the Mechanical Contractor.

.14 Acceptable Product: Watts Model PLT-12, ExpanFlex, Amtrol, Taco, S. A. Armstrong, Bell and Gossett, Zurn, Wilkins Series WXTP.

2.16 COMBINATION EMERGENCY DRENCH SHOWER/EYEWASH UNIT FLOW SWITCH ALARM SYSTEM

.1 Suitable for connection to drench shower with NPS 1 inlet piping rated for a flow of 0.15 L/s.

.2 System to be fully grounded and electrically insulated from water piping for safety.

.3 Power supply: 120/1/60 with 0.5 amp current draw.

.4 Electrical connection: Pre-wired 1800 mm long multiple conductor, quick connect, waterproof cable for easy connection to the alarm assembly.

.5 Flow Switch: UL listed and CSA approved. Watertight and completely assembled for easy hook-up to alarm assembly.

.6 Strobe light: UL Listed and CSA approved. Light intensity to be 258,000 maximum effective candella on horizontal axis. Safety amber-colored glass complete with dust cover. All solid state components with no moving parts for maintenance-free operation.

.7 Audible Horn: UL listed, externally adjustable from 78-103 decibels at 3.0 meters. Horn designed to sound away from the injured person.

.8 On/Off Switch: Enables horn to be turned off while the strobe light continues to flash and the water flows.

.9 Provide complete with one (1) year warranty.

.10 Acceptable Product: HAWS Model 9001, Bradley, Guardian or approved equal.

2.17 OIL INTERCEPTORS

.1 Dura coated interior and exterior fabricated steel oil interceptor rated as indicated with integral storage tank. Unit shall be supplied complete with bronze cleanout plug and trap seal with removable combination pressure equalizer/flow diffusing baffles, gasketted secured cover, sediment bucket, adjustable oil draw-off, and vent connections.

.2 Dimensions as indicated. Water capacity not less than 80 litres, flow rate 132 L/min.

.3 Complete with extension(s) as indicated and as determined by site conditions. Contractor shall be responsible for ensuring that inlet and outlet elevations are suitable for proper drainage.

.4 Standard of Acceptance: Zurn Z1186-ST-700 or approved equal.

.5 Acceptable Product: Zurn Low Profile Grease Interceptor size as indicated, Jay R. Smith, MIFAB, Watts.

2.18 TEMPERED WATER ASSEMBLY

.1 Quantity: one for every lavatory. See plans and schedule drawings.

.2 Mounted below lavatory.

.3 Capacity: set at low capacity: 1.32 LPM (0.35 GPM).

.4 Integral check stops on hot/cold water inlet to each valve, and integral screens.

.5 Each tempered water valve to be equipped with a copper thermostat to sense and control water temperature.

.6 Assembly shall be capable of maintaining water temperature to within 4°C above setpoint within the range of 4°C and 71°C.

.7 Valves to be bronze body.

.8 Valves to be ASSE and cUPC approved.

2.18 TEMPERED WATER ASSEMBLY (Cont'd)

.9 Provide pressure gauges on inlet/outlet of high capcaity valve.

.10 Provude dial thermometer at discharge of tempereed water assembly.

.11 Acceptable Product: Watts Series LFUSG-B-QC-M2, or approved equal.

2.19 CIRCUIT BALANCING VALVES

.1 Sizes: calibrated balancing valves, as specified this section.

.2 NPS 2 and under:
.1 Copper alloy body threaded and 2.1 MPa rating, globe style, self-sealing measuring ports for temperature or pressure probes, locking tamper proof setting.
.2 Mechanical Rooms and Elsewhere: globe, with plug disc as specifed Section 23 05 23.01 - Valves - Bronze.
.3 In lieu of standard malleable iron or copper fittings the Contractor may install the following component system:
.1 Union port fitting with air vent and presssure/temperature port.
.2 Balancing valve, strainer with drain valve, ball valve combination may also be used.

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 plumbing specialities 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

3.1 EXAMINATION (Cont'd)

.1 (Cont'd)

.3 (Cont'd) 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 NON-FREEZE WALL HYDRANTS

.1 Install 900 mm above finished grade and as indicated.

3.6 WATER HAMMER ARRESTORS

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

3.7 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.

3.8 TRAP SEAL PRIMERS

.1 Install for floor drains and elsewhere, as indicated.

.2 Install on cold water supply to nearest frequently used plumbing fixture, in concealed space, to approval of Departmental Representative.

.3 Install soft copper or plastic tubing to floor drain.

3.9 STRAINERS

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

3.10 WATER METERS

.1 Install water meter provided by local water authority and as required for measurement and verification (see mechanical drawings for details and quantity).

.2 Install water meter(s) as indicated.

3.11 OIL INTERCEPTORS

.1 Install with sufficient space for ease of maintenance.

3.12 TEMPERED WATER ASSEMBLY

.1 Confrim the water temperature at the lavatory faucets is a maximum of 49°C.

3.13 CIRCUIT BALANCING VALVES

.1 Install flow measuring stations and flow balancing valves as indicated.

3.14 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.

.3 Provide continuous supervision during start-up.

3.15 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: +/- 2%.

.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.

3.15 TESTING AND ADJUSTING (Cont'd)

.5 Floor drains:(Cont'd)
.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 Roof drains:
.1 Check location at low points in roof.
.2 Check security, removability of dome.
.3 Adjust weirs to suit actual roof slopes, meet requirements of design.
.4 Clean out sumps.
.5 Verify provisions for movement of roof systems.

.8 Access doors:
.1 Verify size and location relative to items to be accessed.

.9 Cleanouts:
.1 Verify covers are gas-tight, secure, yet readily removable.

.10 Water hammer arrestors:
.1 Verify proper installation of correct type of water hammer arrester.

.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.

3.15 TESTING AND ADJUSTING (Cont'd)

.13 Water meters:
.1 Verify location and accessibility.
.2 Test meter reading accuracy.

3.16 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.

3.17 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 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 01 35 21 - LEED Requirements.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.18 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