1 General

1.1 REFERENCES

.1 American National Standards Institute (ANSI).
- .1 ANSI/ASME B16.15-1985, Cast Bronze Threaded Fittings, Classes 125 and 250.
- .2 ANSI B16.18-1984, Cast Copper Alloy Solder Joint Pressure Fittings.
- .3 ANSI/ASME B16.22-1989, Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.
- .4 ANSI B16.24-1979, Bronze Pipe Flanges and Fittings, Class 150 and 300.
- .5 ANSI/AWWA C111/A21.11-85, Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
- .6 NSF/ANSI 61-2008, Drinking Water System Components – Health Effects.

.2 ASTM International (ASTM).
- .1 ASTM A307-89, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
- .2 ASTM B88M-89, Specification for Seamless Copper Water Tube (Metric).
- .3 ASTM B32-89, Specification for Solder Metal.
- .4 ASTM B306-88, Specification for Copper Drainage Tube (DWV).
- .5 ASTM C564-88, Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
- .6 ASTM D2235-89, Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
- .7 ASTM D2564-88, Specification for Solvent Cements for Poly (Vinyl-chloride) (PVC) Plastic Pipe and Fittings.

.3 Canadian Standards Association (CSA).
- .1 CSA B67-1972, Lead Service Pipe, Waste Pipe, Traps, Bends and Accessories.
- .2 CAN/CSA-B70-M91, Cast Iron Soil Pipe, Fittings and Means of Joining.
- .3 CAN/CSA-B125-M89, Plumbing Fittings.
- .4 CAN/CSA-B181.1-M90, ABS Drain, Waste and Vent Pipe and Pipe Fittings.
- .5 CAN/CSA-B181.2-M90, PVC Drain, Waste and Vent Pipe and Pipe Fittings.
- .6 CAN/CSA-B182.1-M87, Plastic Drain and Sewer Pipe and Pipe Fittings.

.4 Manufacturers Standardization Society (MSS).
- .1 MSS-SP-67-1990, Butterfly Valves.
- .2 MSS-SP-70-1984, Cast Iron Gate Valves, Flanged and Threaded Ends.
- .3 MSS-SP-71-1984, Cast Iron Swing Check Valves, Flanged and Threaded Ends.
- .4 MSS-SP-80-1987, Bronze Gate, Globe, Angle and Check Valves.

1.2 PRODUCT DATA

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit data for following: valves.

1.3 MAINTENANCE DATA

.1 Provide maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 POTABLE WATER SYSTEMS

.1 All potable water systems and components, including solder, shall be free of lead.

2 Products

2.1 DOMESTIC WATER PIPING AND FITTINGS

.1 Domestic hot, cold, and recirculation systems.
- .1 Above ground within building: copper tube, hard drawn, type L: to ASTM B88M.

.2 Fittings:
- .1 Bronze pipe flanges and flanged fittings, Class 150 and 300: to ANSI B16.24.
- .2 Cast bronze threaded fittings, Class 125 and 250: to ANSI/ASME B16.15.
- .3 Cast copper, solder type: to ANSI B16.18.
- .4 Wrought copper and copper alloy, solder type: to ANSI/ASME B16.22.

.3 Joints:
- .1 Rubber gaskets, 1.6 mm thick: to ANSI/AWWA C111/A21.11.
- .2 Bolts, nuts, hex head and washers: to ASTM A307, heavy series.
- .3 Solder/brazing: lead free 95.5/4/0.5 Tin-Copper-Silver solder.
- .4 Teflon tape: for threaded joints.

2.2 SANITARY, VENT, CONDENSATE DRAIN PIPING, TUBING AND FITTINGS - CAST IRON AND COPPER

.1 Above ground sanitary and vent Type DWV to: ASTM B306.
- .1 Fittings.
  - .1 Cast brass: to CAN/CSA B125.
  - .2 Wrought copper: to CAN/CSA B125.
  - .3 For condensate drains and pan drains use type M hard drawn copper tubing with wrought copper fittings.
- .2 Solder/brazing: lead free 95.5/4/0.5 Tin-Copper-Silver solder.

.2 Buried sanitary and vent minimum NPS 3, to: CAN/CSA-B70, with one layer of protective coating.
- .1 Mechanical joints.
  - .1 Neoprene or butyl rubber compression gaskets: to ASTM C564 or CAN/CSA-B70.
  - .2 Stainless steel clamps.
- .2 Hub and spigot.
  - .1 Caulking lead: to CSA B67.
  - .2 Cold caulking compounds.

.3 Above ground sanitary and vent: to CAN/CSA-B70.
- .1 Mechanical joints.
  - .1 Neoprene or butyl rubber compression gaskets: to ASTM C564 or CAN/CSA-B70.
  - .2 Stainless steel clamps.
- .2 Hub and spigot.
  - .1 Caulking lead: to CSA B67.
  - .2 Cold caulking compounds.

2.3 SANITARY AND VENT PIPING AND FITTINGS - PLASTIC OUTSIDE OF MECHANICAL ROOMS

.1 For buried DWV piping to:
  .1 CAN/CSA-B181.2 for PVC DWV.

.2 Joints
  .1 Solvent weld for PVC: to ASTM D2564.

.3 For above ground PVC
  .1 CAN/CSA-B181.2 for Fire Resistive PVC DWV

2.4 BALL VALVES

.1 NPS 2 and under, screwed:
  .1 Class 150.
  .2 Bronze two piece body, chrome plated brass or stainless steel ball, PTFE Teflon adjustable packing, brass gland and PTFE Teflon seat, steel lever handle.

.2 NPS 2 and under, soldered:
  .1 To ANSI B16.18, Class 150.
  .2 Bronze two piece body, chrome plated brass or stainless steel ball, PTFE Teflon adjustable packing, brass gland and PTFE Teflon seat, steel lever handle, with NPT to copper adaptors.

3 Execution

3.1 INSTALLATION

.1 Install in accordance with National Plumbing Code 2010 and Departmental Representative except where specified otherwise.

.2 Cut square, ream and clean tubing and tube ends, clean recesses of fittings and assemble without binding.

.3 Assemble all piping using fittings manufactured to ANSI standards.

.4 Install piping and tubing parallel and close to building structure to minimize furring, conserve headroom and space. Group exposed piping and run parallel to walls.

.5 Connect to fixtures and equipment in accordance with manufacturer’s instructions unless otherwise indicated.

.6 Buried piping:
  .1 Install buried pipe on 150 mm of washed clean sand, shaped to accommodate hubs and fittings. Install piping to line and grade as indicated.
  .2 Backfill to 150 mm above top of pipe with washed clean sand.
  .3 Bedding preparation and backfilling required to carry out this work shall be by this trade.

.7 Vent sanitary sewer in accordance with the National Plumbing Code.

3.2 VALVES

.1 Isolate domestic water system equipment, fixtures and branches with ball valves.

.2 Balance domestic hot water recirculation systems using balance valves provided. Mark settings and record drawings on completion.

3.3 DISINFECTION OF POTABLE WATER SYSTEMS

.1 Flush out and clean all potable water piping systems as per the following;

.1 Prior to disinfecting, remove all screens from faucets and strainers and flush until all dirt or other contaminants have been thoroughly removed. Screens of faucets and strainers should not be reinstalled until after completion of the disinfection process.

.2 Disinfection should be done with either chlorine gas or liquid. Calcium or Sodium Hypochlorite or another Departmental Representative approved disinfectant. Use non-hazardous material that can be drained into the municipal sewer system.

.3 A service cock should be provided and located at the water service entrance. The disinfecting agent should be injected into and through the system from this cock only.

.4 The disinfecting agent should be injected using a proportioning pump or device through the service cock slowly and continuously at an even rate. During disinfecting, flow of the disinfecting agent into the main connection to the municipal water supply **IS NOT PERMITTED.**

.5 All sectional valves should be open during disinfection. All outlets should be fully opened at least twice during injection and residual checked with orthotolidin solution.

.6 If chlorine is used, when the chlorine residual concentration, calculated on the volume of water in the pipe will contain, indicates no less than 50 parts per million (ppm) or per milligram per litre (mg/L) at all outlets, then all outlets should be closed and secured.

.7 The residual chlorine should be retained in the piping system for a period of not less than 24 hours.

.8 After the retention, the residual should not be less than 5 ppm. If less, then the process should be repeated as per above.

.9 If satisfactory, then all fixtures should be flushed with clean potable water until residual chlorine by orthotolidin test is not greater than that of the incoming water supply. (this may be zero)

.10 All work and certification should be performed by a Departmental Representative approved applicator or qualified person with chemical and laboratory experience. Certification of performance should indicate the following;

.1 Name, location and date when disinfection was performed.
.2 Material used for disinfection
.3 Retention period of disinfectant in piping system
.4 Ppm (mg/L) chlorine during retention
.5 Ppm (mg/L) chlorine after flushing
.6 Statement that disinfection was performed as specified
.7 Signature and address of company / person performing disinfection.

.11 The contractor shall submit three copies of final report to Departmental Representative.

.12 Under no circumstances is any portion of the domestic water system is to be used until flushed, disinfected and accepted by the Departmental Representative.

3.4 BALANCING

.1 Refer to Section 20 05 00 - Basic Mechanical Materials and Methods.

END OF SECTION

1 General

1.1 REFERENCES

.1 ASTM International (ASTM).
- .1 ASTM A126-04(2009), Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
- .2 ASTM B62-09, Specification for Composition Bronze or Ounce Metal Castings.

.2 American Water Works Association (AWWA).
- .1 ANSI/AWWA C700-09, Cold Water Meters-Displacement Type.
- .2 ANSI/AWWA C701-07, Cold Water Meters-Turbine Type for Customer Service.
- .3 ANSI/AWWA C702-10, Cold Water Meters-Compound Type.

.3 Canadian Standards Association (CSA).
- .1 CAN/CSA-B64 Series-07, Backflow Preventers and Vacuum Breakers.
- .2 CAN/CSA-B64.10-07, Backflow Prevention Devices - Selection, Installation Maintenance and Field Testing.
- .3 CAN/CSA-B79-05, Floor Drains and Trench Drains.

.4 The Plumbing and Drainage Institute (PDI).
- .1 PDI-G101, Testing and Rating Procedure for Grease Interceptors with Appendix of Sizing and Installation Data.
- .2 PDI-WH201, Water Hammer Arrestors.

1.2 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate dimensions, construction details and materials for following:

1.3 MAINTENANCE DATA

.1 Provide maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.2 Data to include:
- .1 Description of plumbing specialties and accessories, giving manufacturers name, supplier's name and address, type, model, year and capacity.
- .2 Details of operation, servicing and maintenance.
- .3 Recommended spare parts list.

2 Products

2.1 FLOOR DRAINS

.1 Floor drains and trench drains: to CAN3-B79.

.2 FD1: general duty, cast iron body 125 mm round, adjustable head, nickel bronze strainer, integral seepage pan, clamping collar, trap primer connection, and vandal-proof secured top.

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 Wall access: face or wall type, polished nickel bronze or stainless steel square cover with flush head securing screws, beveled edge frame complete with anchoring lugs.

.3 Floor cleanouts: (Use cover to match floor type and general use type for unfinished floors).

.1 General use cleanouts, cast iron body, interior seal plug, adjustable polished nickel bronze head and gasketed, secured, scoriated cover.

.2 For terrazzo floors same as general use except with cover for terrazzo floors.

.3 For tile or linoleum floors same as general use except with cover for tile floors.

.4 For carpeted floors same as general use except with cover for carpeted floors.

.5 Heavy duty use cleanouts, cast iron body, interior seal plug, adjustable polished nickel bronze head and gasketed cover, secured, scoriated, heavy duty cover.

2.3 WATER HAMMER ARRESTORS

.1 Stainless steel bellows or copper piston construction: to PDI-WH 201.

2.4 TRAP SEAL PRIMERS

.1 Single distribution trap primer c/w air gap, distribution unit containing required quantity of compression fittings.

.2 Tubing: 13 mm PEX piping.

3 Execution

3.1 INSTALLATION

.1 Install in accordance with National Plumbing Code and local authority having jurisdiction except where specified otherwise.

.2 Install in accordance with manufacturer's instructions and as specified.

3.2 CLEANOUTS

.1 In addition to those required by code, and as indicated, install at base of all soil and waste stacks, and rainwater leaders and where 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.

3.3 WATER HAMMER ARRESTORS

.1 Install on branch supplies to each fixture or group of fixtures, branch lines to dishwasher and where indicated.

3.4 TRAP SEAL PRIMERS

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

.2 Coordinate power requirements and locations with Division 25 - Integrated Automation.

3.5 COMMISSIONING

.1 After start-up, test, adjust and prove operation of all equipment and accessories to suit site conditions, including but not limited to:

.2 Clean out strainers periodically until clear.

.3 Clean out and prime all floor drain traps using trap seal primers or other means acceptable to the National Plumbing Code.

.4 Prove freedom of movement of cleanouts. Cleanouts covers of clean-outs and floor drain strainers.

.5 Backflow preventers: Confirm operation of backflow preventers and vacuum breakers, with test procedures in accordance with CSA B64.10 and authority having jurisdiction.

.6 Confirm thermostatic mixing valve temperatures with flows specified.

END OF SECTION

1 General

1.1 REFERENCES

.1 American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE).
- .1 ASHRAE 18-2008 (RA 2013), Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration.

.2 Canadian Standards Association (CSA).
- .1 CAN/CSA-B45 Series-02 (R2013), CSA Standards on Plumbing Fixtures.
- .2 CSA B125-01, Plumbing Fittings.

.3 NSF International (NSF).
- .1 NSF/ANSI 42-2020, Drinking Water Treatment Units - Aesthetic Effects.
- .2 NSF/ANSI 53-2020, Drinking Water Treatment Units - Health Effects.
- .3 NSF/ANSI 61-2020, Drinking Water System Components - Health Effects.
- .4 NSF/ANSI/CAN 372-2020, Drinking Water System Components – Lead Content.

.4 Underwriters Laboratories (UL).
- .1 UL 399-2017, Drinking Water Coolers.

1.2 PRODUCT DATA

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate: dimensions, construction details and roughing-in dimensions for all fixtures and trim.

1.3 MAINTENANCE DATA

.1 Provide maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.2 Data to include:
- .1 Description of plumbing fixtures and trim giving manufacturer’s name, type, model, year, and capacity
- .2 Details of operation, servicing, and maintenance.
- .3 Recommended spare parts list.

1.4 FIXTURES AND TRIM

.1 Architectural drawings to govern in determination of number and location of fixtures.

.2 Exposed plumbing brass to be chrome plated.

.3 Caulk around bases of water closets to floors and wall hung lavatories to walls with mildew resistant silicone sealant, white in color, and tooled to smooth bead.

.4 Product description takes precedence over model numbers.

.5 Fixtures: Manufacturer in accordance with CAN/CSA-B45.

.6 Trim and Fittings: Manufacturer in accordance with CSA B125.

.7 All fixtures used shall be CSA approved.

2 Products

2.1 WATER CLOSETS

.1 WC1: Barrier-free water closet, 4.8 Lpf (1.28 gpf).
- .1 Bowl: vitreous china, floor mounted, antimicrobial surface, syphon jet, elongated rim, close coupled, bolt caps, 254 mm (10") rough-in, 419 mm (16.5") floor to top of bowl, MaP rating of 1000.
- .2 Flush tank: Pressure assisted assembly with touchless electronic sensor operation, vitreous china, lined tank with bolted cover.
- .3 Seat: white, open front molded solid plastic, less cover, SS check hinge, posts, washers and nuts.
- .4 Stops: lockshield screwdriver angle stop c/w flexible riser, brass supply nipple and SS wall flange.

2.2 LAVATORIES

.1 L1: White vitreous china, wall hung rectangular basin, three holes, 100 mm centers, integral back splash, self-draining deck area, sloped front lip, rear overflow, rear outlet and J.R. Smith 0710-D back-to-back concealed arms support. C/W barrier free pipe covers. Size approximately 470 mm x 430 mm.
- .1 Trim: supply fitting to be solid cast brass body with integral proximity sensor, with vandal resistant 1.9 L (0.5 gpm) outlet. Supply stops on hot and cold water to be heavy pattern, cast body stops c/w flexible braided stainless steel risers. Waste to be offset cast plug with open grid strainer. Trap to be cast brass adjustable P-trap with cleanout. Waste fitting, trap and supplies to be complete with protective pipe covering system conforming to ADA requirements. Carrier for mounting in metal stud wall construction. Supply fitting to be c/w 24 volt hard wired infra-red sensor, recessed control box mounted in wall below sink with stainless steel access cover, stops, mixing valve temperature limit stop, braided hose and CSA certified. Supply 120/24 volt transformer, one per room. Supply all inter-connecting components for a complete operational system as per manufacturer's recommendations. The plumbing contractor is responsible for the supply and installation for all low voltage (24V) wiring for all electronic plumbing fixtures.

2.3 BOTTLE FILLER

.1 Wall mount, recessed water bottle filling station for indoor application

.2 Lead-free design, ADA, NSF 42/53/61/372, UL 399 compliant

.3 Finish: Stainless steel

.4 ADA, NSF 42/53/61/372, UL 399 compliant

.5 Drain connection

.6 Electronic Bottle Filler Sensor activation

.7 Silver ion antimicrobial protection on key plastic components to inhibit the growth of mold and mildew.

.8 Filter: to NSF 42 and 53, for lead particulate, chlorine, taste, and odour reduction. 3,000 gallon capacity.

.9 Electrical: 115V/60Hz.

.10 Include:
- .1 Bottle filler.
- .2 Filter.
- .3 Mounting frame.

2.4 FIXTURE SUPPLIES

.1 Chrome plated rigid fixture supplies with screwdriver stops, reducers and escutcheons on each service to each fixture.

2.5 CHAIR CARRIERS

.1 Provide for all wall mounted plumbing fixtures, factory manufactured floor mounted carrier systems.

2.6 FIXTURE TRAPS

.1 Brass P traps complete with cleanouts on all fixtures which do not have built-in traps. Chrome plated in all exposed places.

2.7 ROUGHING-IN OF FIXTURES

.1 Rough in for equipment by others complete with valved supplies, wastes and vents, capped.

3 Execution

3.1 FIXTURE INSTALLATION

.1 Connect fixtures complete with supplies and drains, trapped, supported level and square. Hot water faucets shall be on left. Fixtures on outside walls to have supplies from floor; other fixtures to be served from wall. Wall hung fixtures to be securely and firmly mounted.

.2 Mounting heights for wall hung fixtures and showers measured from finished floor:
- .1 Standard: to comply with manufacturers roughing-in details unless otherwise indicated or specified.

3.2 COMMISSIONING

.1 Flush valves: adjust settings to suit site conditions.

.2 Aerator screens and strainers: remove, clean out and reinstall.

.3 Lavatories: verify in writing maximum temperature settings as specified.

.4 Maximum temperature settings to be verified using a digital thermometer.

.5 Electronics: verify distance settings for all electronic sensors.

END OF SECTION