PART 1 GENERAL

1.1 Related Sections

.1	Section 01 11 55	General Instructions
.2	Section 01 35 33	Health and Safety Requirements
.3	Section 23 05 00	Common Work Results for Mechanical
.4	Section 23 05 05	Installation of Pipework
.5	Section 23 05 29	Hangers & Supports for Piping & Equipment
.6	Section 23 05 48	Vibration & Seismic Controls for Ductwork Piping & Equipment
.7	Section 23 07 19	Thermal Insulation for Piping

1.2 References

.1 American Society for Testing and Materials International, (ASTM).

- .1 ASTM B32-08, Standard Specification for Solder Metal.
- .2 ASTM B306-13, Standard Specification for Copper Drainage Tube (DWV).
- .3 ASTM C564-12, Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.

.2 Canadian Standards Association (CSA International).

- .1 CAN/CSA-B70-12, Cast Iron Soil Pipe, Fittings and Means of Joining.
- .2 CSA-B125-12, Plumbing Fittings.

1.3 Submittals

.1 Submittals in accordance with Section 01 11 55 – General Instructions.

.2 Provide maintenance data for incorporation into manual specified in Section 01 11 55 – General Instructions.

1.4 Health and Safety

.1 Do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.

1.5 Waste Management and Disposal

.1 Separate waste materials for reuse and recycling in accordance with Section 01 11 55 – General Instructions.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Place materials defined as hazardous or toxic in designated containers.

.4 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.

.5 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan

.6 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 PRODUCTS

2.1 Copper Tube and Fittings

.1 Above ground sanitary storm and vent, Copper Type DWV to: ASTM B 306.

.1 Fittings.

.1 Cast brass: to CAN/CSA-B125.

.2 Wrought copper: to CAN/CSA-B125.

.2 Solder: tin-lead, 50:50, type 50A or lead free, tin-copper alloy 95:5, type TA to ASTM B 32.

2.2 Cast Iron Piping and Fittings

.1 Buried sanitary, storm and vent, cast iron (minimum NPS 2) to: CAN/CSA-B70.

.1 Joints.

.1 Mechanical joints.

.1 Neoprene or butyl rubber compression gaskets: to ASTM C 564 or CAN/CSA-B70.

.2 Stainless steel clamps.

.2 Above ground sanitary, storm and vent: Cast iron to CAN/CSA-B70.

.1 Joints.

.1 Mechanical joints.

.1 Neoprene or butyl rubber compression gaskets with stainless steel clamps.

2.3 ABS Piping

.1 Drainage piping under the building, provided that such piping does not pass through any fire separations, may be as follows, at the contractor's option:

.1 Underground sanitary drainage piping under building, 150mm in diameter and smaller, certified to the current version of CSA B181.1, ABS Drain, Waste and Vent Pipe and Fittings. Piping shall be solid wall in construction. Cell core piping is not acceptable.

.2 The use of ABS piping inside building is not permitted.

2.4 PVC Piping

.1 Drainage piping under the building may be as follows, at the contractor's option:

.1 Underground sanitary drainage piping under building, 100mm in diameter or larger, certified to the current version of CSA B181.2, PVC Drain, Waste and Vent Pipe and Fittings.

.2 The use of PVC drain pipe inside building is not permitted.

PART 3 EXECUTION

3.1 Installation

.1 Install in accordance with Section 23 05 05 - Installation of Pipework, Section 23 05 29 – Hangers & Supports for Piping & Equipment, and Section 23 05 48 – Vibration & Seismic Controls for Ductwork Piping & Equipment.

.2 Install in accordance with National Plumbing Code and local authority having jurisdiction.

.3 Install buried pipe on 150 mm bed of clean washed sand, shaped to accommodate hubs and fittings, to line and grade as indicated. Backfill with 150 mm of clean washed sand.

.4 Install above ground piping parallel and close to walls and ceilings to conserve headroom and space, and to grade as indicated.

3.2 Testing

.1 Pressure test buried systems before backfilling.

.2 Hydraulically test to verify grades and freedom from obstructions.

3.3 Performance Verification

.1 Cleanouts:

.1 Ensure accessible and that access doors are correctly located.

.2 Open, cover with linseed oil and re-seal.

.3 Verify that cleanout rods can probe as far as the next cleanout, at least.

.2 Test to ensure traps are fully and permanently primed.

.3 Storm water drainage:

.1 Verify domes are secure.

.2 Ensure weirs are correctly sized and installed correctly.

.3 Verify provisions for movement of roof system.

.4 Ensure that fixtures are properly anchored, connected to system and effectively vented.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1	Section 01 11 55	General Instructions
.2	Section 01 35 33	Health and Safety Requirements
.3	Section 01 90 00	Commissioning
.4	Section 22 42 01	Plumbing Specialties and Accessories
.5	Section 23 05 00	Common Work Results for Mechanical
.6	Section 23 05 48	Vibration & Seismic Controls for Ductwork, Piping and Equipment

1.2 References

.1 Canadian Standards Association (CSA International)

- .1 CSA B51-2014, Boiler, Pressure Vessel, and Pressure Piping Code.
- .2 CAN/CSA C22.2 No.110-94 (R2004), Construction and Test of Electric Storage Tank Water Heaters.
- .3 CAN/CSA-C191-04, Performance of Electric Storage Tank Water Heaters for Household Service.
- .4 CAN/CSA-C309-M90 (R2009), Performance Requirements for Glass-Lined Storage Tanks for Household Hot Water Service.

.2 National Sanitation Foundation (NSF) / American National Standards Institute (ANSI).

- .1 NSF/ANSI 61, Drinking Water System Components.

1.3 Submittals

.1 Submittals in accordance with Section 01 11 55 – General Instructions.

.2 Provide maintenance data for incorporation into manual specified in Section 01 11 55 – General Instructions.

1.4 Health and Safety

.1 Do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.

1.5 Waste Management and Disposal

.1 Separate waste materials for reuse and recycling in accordance with Section 01 11 55 – General Instructions.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Place materials defined as hazardous or toxic in designated containers.

.4 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.

.5 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan

.6 Fold up metal banding, flatten and place in designated area for recycling.

1.6 Quality Assurance

.1 All potable water system components shall conform to NSF/ANSI Standard 61.

PART 2 PRODUCTS

2.1 Electric Domestic Hot Water Heater

.1 General: Automatic, electric, tank-type domestic hot water heater. To CAN/CSA C22.2 No.110, CAN/CSA-C191.

.2 Electric potable water heater with an input exceeding 29.29 kW [100,000 Btuh] or an inside diameter over 610mm [24"] shall be designed and constructed to ANSI/ASME Boiler and Pressure vessel Code and require a CRN issued by the Boiler and Pressure Vessel Safety Branch.

.3 Tank: heavy blanket insulation with baked enamel finish sheet metal lagging, 457 L [120 gallon], Size 750mm (29.5") Diam. x 1575mm (62") H.

.4 Heater: bronze immersion, 12 kW, 208/3/60.

.4 Features:

.1 Anti-siphon inlet.

.2 Anodic corrosion protection.

.3 Pressure and temperature relief valve. Pipe valve to drain. Install sensing bulb in tank water.

PART 3 EXECUTION

3.1 Installation

.1 Install in accordance with manufacturer's recommendations and authority having jurisdiction.

.2 Pipe relief valve to floor drain.

.3 Install unions to permit removal or replacement of equipment.

.4 Install tees in lieu of elbows at changes in direction of piping. Install plug in open ends of tees.

.5 Pipe vertical condensate drain from flue vent to floor drain. Drain pipe shall be silicone hose. Install condensate trap (loop) per installation instruction and prime trap.

.6 Provide vacuum breaker to CSA B64-01 as specified in Section 22 42 01 – Plumbing Specialties and Accessories.

3.2 Field Quality Control

.1 Commissioning:

.1 In accordance with Section 01 90 00 – Commissioning, and Section 23 08 00 – Commissioning of Mechanical Systems.

.2 Manufacturer to:

.1 Certify installation.

.2 Start up and commission installation.

.3 Carry out on-site performance verification tests.

.4 Demonstrate operation and maintenance.

.3 Provide Departmental Representative at least 48 hours notice prior to inspections, tests, and demonstrations. Submit written report of inspections and test results.

3.3 Cleaning

.1 Proceed in accordance with Section 01 01 50 – General Instructions, and Section 23 08 02 – Cleaning & Startup of Mechanical Piping Systems.

.2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 GENERAL

1.1 Summary

.1 Section Includes:

.1 The supply and installation of Plumbing Fixtures and Trim.

.2 Products Installed but not Supplied Under this Section:

.1 Install rough-in for equipment supplied by others, complete with valves on hot and cold water supplies, waste and vent.

.2 Equipment installed by others.

.1 Connect with unions.

.3 Equipment not installed.

.1 Capped for future connection by others.

1.2 Related Section

.1	Section 01 11 55	General Instructions
.2	Section 01 35 33	Health and Safety Requirements
.3	Section 23 05 00	Common Work Results for Mechanical

1.3 References

.1 Canadian Standards Association (CSA International).

.1 CAN/CSA-B45 Series 02 (R2013) Plumbing Fixtures.

.2 CSA-B125.3-12, Plumbing Fittings.

.3 CSA-B651-12, Accessible Design for Built Environment.

.2 National Sanitation Foundation (NSF) / American National Standards Institute (ANSI).

.1 NSF/ANSI 61, Drinking Water System Components.

1.4 Submittals

.1 Submittals in accordance with Section 01 11 55 – General Instructions.

.2 Indicate, for all fixtures and trim:

.1 Dimensions, construction details, roughing-in dimensions.

1.5 Closeout Submittals:

.1 Submit maintenance data in accordance with Section 01 11 55 – General Instructions.

.2 Include:

.1 Description of fixtures and trim, giving manufacturer's name, type, model, year, capacity.

.2 Details of operation, servicing, maintenance.

.3 List of recommended spare parts.

1.6 Health and Safety

.1 Do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.

1.7 Delivery Storage and Disposal

.1 Waste Management and Disposal:

.1 Separate waste materials for recycling in accordance with Section 01 11 55 – General Instructions.

.2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan

.3 Fold up metal banding, flatten and place in designated area for recycling.

1.6 Quality Assurance

.1 All potable water system components shall conform to NSF/ANSI Standard 61.

PART 2 PRODUCTS

2.1 Manufactured Units

.1 Fixtures: manufacture in accordance with CAN/CSA-B45 series.

.2 Trim, fittings: manufacture in accordance with CAN/CSA-B125.

.3 Exposed plumbing brass shall be chrome plated finish. Water supply piping exposed in finished areas shall be chrome plated brass pipe and fittings.

.4 Number, locations: architectural drawings to govern.

.5 Fixtures in any one location to be product of one manufacturer and of same type.

.6 Trim in any one location to be product of one manufacturer and of same type.

.7 Fixture Schedule:

FD- 1 Floor Drain with Elastometric Flange in Washrooms

Drainage on-grade epoxy coated cast iron floor drain with anchor flange, weepholes, adjustable heel proof nickel bronze strainer with wide flange, and no hub (standard) outlet. Vandal proof, 6" (152) strainer diam., 3" (75) pipe size connection. Notch floor surface to accommodate flange.

FD- 2 Floor Drain with Elastometric Flange in Kitchen

Drainage on-grade epoxy coated cast iron floor drain with anchor flange, weepholes, adjustable heel proof nickel bronze strainer with wide flange, and no hub (standard) outlet. Vandal proof, 6" (152) strainer diam., 3" (75) pipe size connection, backwater valve. Notch floor surface to accommodate flange.

FD- 3 Floor Drain Janitor Room Basement

Floor Drain, all duco coated, 9" (220mm) dia. cast iron body, reversible flashing clamp with seepage openings, no-hub outlet round Funnel 4" (102mm) dia. nickel bronze, trap primer connection 1/2" (13mm) , 5" Nickel Bronze Round Strainer.

WC-1 Water Closet (Regular Use)

Vitreous china water closet, floor mounted, closed coupled commercial grade high performance toilet, elongated front bowl and tank set, maximum performance (MaP) rating of ≥1000 g per flush, full glazed trapway, integral flush rim, water spot area 9 ½" x 7 3/8", closet bolts and caps, compliant with applicable sections of ASME A112.19.2/CSA B45.1, 15" height, low consumption 1.6 GPF, Compatible seat with cover.
WC rough in and installation shall use LEAD STUBS and BRASS FLANGES. Provide wax seal.

WC-2 Water Closet (Handicapped Use)

ADA compliant, vitreous china water closet, floor mounted, closed coupled commercial grade high performance toilet, elongated front bowl and tank set, maximum performance (MaP) rating of ≥1000 g per flush, full glazed trapway, integral flush rim, water spot area 9 ½" x 7 3/8", closet bolts and caps, compliant with applicable sections of ASME A112.19.2/CSA B45.1, 17" height, low consumption 1.6 GPF, Compatible seat with cover.
WC rough in and installation shall use LEAD STUBS and BRASS FLANGES. Provide wax seal.

L-1/2 Lavatory (Handicapped Use / Regular Use)

Refer to architectural specification for lavatory basin installed in countertop [Barrier free-vitreous china lavatory].
Provide hardwire electronic faucet, one-piece body, chrome-plated CAST 102 mm (4") spout with integral sensor, transformer, (24 VAC) hardwire powered by Class II transformer, Adjustable sensing range and timeout, Forged brass solenoid valve, Surface mount housing, Mixing valve. Hardwire - 4" Lavatory - CAST one-piece body with converter to convert 24VAC to 6 VDC), Cast lavatory spout 4" (102mm), Vandal Resistant 0.5 gpm (1.9 L/min) Laminar Outlet, Solenoid and Controller in Surface Mount Housing- that require single tempered water supply, thermostatic mixing valve.
Offset open grid polished chrome cast brass P.O. plug with 19 holes c/w rubber washer, friction washer, brass locknut and tailpiece (1 ¼" size with overflow holes).
Chrome plated angle valve stops (screwdriver stops) for cold and hot water with escutcheon. Braided supply tubes (10mm) between stops, control valves, thermostatic mixing valve [point of use valve, min. flow 0.35 GPM, max. flow 5.8 gpm, integral check valve in cold and hot inlet, outlet temperature range 95-120 F] and faucet.
Pre-wrapped adjustable cast brass P-trap kit with pre-wrapped offset grid drain. Furnished with cast brass adjustable P-trap with cleanout, offset grid drain assembly, supply angle stop covers, etc.

UR-1 Urinal (Handicapped Use) – with Metering Valve

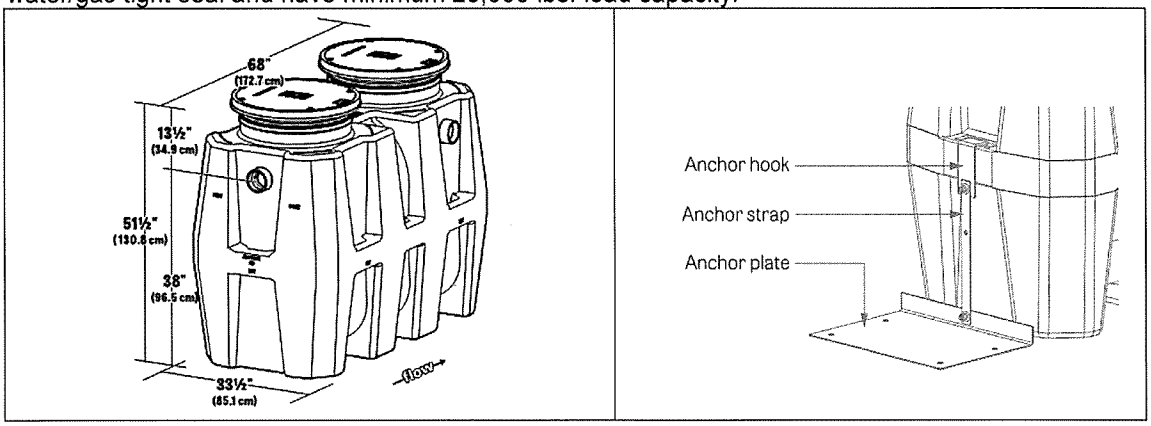
Urinal: low consumption, wall hung for concealed flush valve, vitreous china, wash out flush action 1.9 LPF (0.5 GPF) per flush, extended sides for privacy, integral flush spreader, 3/4" (19mm) back spud, wall hangers, open trap. Strainer, removable stainless steel.
Flush valve: HEAVY-DUTY, back inlet supply, CAST BRASS valve for 3/4" IP spud urinal, Polished chrome plated finish, slow close cartridge, factory set for 0.5 gallon (1.9 litres) flush, Chrome plated union inlet stop, Brass oscillating lever handle, coupling nuts, inlet cover tube, Set screw wall flange, spud flange, outlet tube, 1/2" universal FIP/copper sweat inlet for Washdown Urinals.
Urinal Carrier, with bearing plates and steel pipe legs, welded to block base feet supports.
Provide 'p' Trap, cast brass 1-1/2" (38mm) with cleanout, union and escutcheon.

WBFS-1 Water Bottle Filling Station

Surface mount sports bottle filer, non-refrigerated unit that deliver ambient water (5kg, inlet size 10mm, overall depth 144mm, height 633mm, width 414mm, satin surface finish, wall mounted, sensor operated, ADA compliant. Deep alcove to accommodate for larger diameter containers even if they have a small neck. Moulded components utilize a silver-based antimicrobial compound that reduces the growth of micro-organisms and mildew to protect the surfaces from discolouration, odours and degradation. Built-in 10 micron strainer stops particles before they enter the waterway. Waterways are lead-free in materials and construction. Heavy duty steel frame. Tailpiece is sized to accept either 1 1/2" (38 m) or 1 1/4" (32 m) P-trap.
Provide chrome plated P-Trap.
Product should be Certified to NSF/ANSI Standard 61, Annex G (weighted average lead content of <=0.25%) and is in compliance with California's Health & Safety Code Section 16875 (commonly known as AB1953). Models covered by this specification comply with all known Plumbing Codes. Listed by Underwriters' Laboratories to U.S. and Canadian standards.
Surface mount, sensor activated with bottle counter.

GI-1 Grease interceptor

Basin grease interceptor with lifetime guaranteed made with seamless, rotationally-molded polyethylene. Interceptor shall be certified to ASME A112.14.3 (Type C) and CSA B481.1, with field adjustable riser system with cover, anchor kit, built-in flow control, integral membrane clamping collar kit, pump-out port, built-in test caps and three outlet options. Interceptor shall be rated for 250 GPM. Interceptor grease capacity shall be 69 gal (500 lbs) lbs. Cast-iron cover (H20 rated) shall provide water/gas tight seal and have minimum 23,000 lbs. load capacity.



Provide 2-way cleanout tee to grade (not shown on drawing). Provide tele-glide risers. Refer to installation instructions for details. All below-grade installs require a concrete pad to support the cover at grade, keep surface water out of the system (by proper pitch away from lids), and keep dirt/debris away from the covers.

EXCAVATION
1. Surrounding soil must be undisturbed soil or well compacted engineering fill.
2. Width and length of excavation shall be a minimum of 12" greater than the tank on all sides and depth shall be 6" that tank bottom.
3. Set the tank level on a 6" deep layer of well-packed crushed aggregate material and connect waste piping per General Installation Instructions.
BACKFILL
1. Preparation of sub grade per geotech recommendations.
2. Stabilize and compact sub grade to 95% proctor.
3. Fill unit with water before backfilling to stabilize unit and prevent float-out during backfilling. Secure covers and risers (if necessary) to the unit.
4. Backfill evenly around tank using crushed aggregate (approximately 3/4" size rock or sand, with no fines), or flowable fill. Do not compact backfill around unit.
FINISHED CONCRETE SLAB
Slab must extend 18" minimum outside the unit footprint. Vehicular traffic areas: Minimum 8" thick concrete slab with rebar required; final thickness of concrete around cover to be determined by specifying engineer hired by contractor. If traffic loading is required the concrete slab dimensions shown are for guideline purposes only. Concrete to be 28 day compressive strength to 4,000 PSI. Use NO. 4 rebar (ø 1/2") grade 60 steel per ASTM A615: connected with tie wire. Rebar to be 2-1/2" from edge of concrete and spaced in a 12" grid with 4" spacing around access openings

DTV-1 Drain Water Tempering Valve

Provide 20mm drain water tempering valve to prevent water above 140F discharged into sanitary sewer. Provide water hammer arrestor, check valve and discharge to drain with air gap. ThermOmegaTech product or approved equal. Refer to manufacturer's instruction for installation.

TP-1 Trap Primer

Electronic trap primer with solenoid actuating device, vacuum breaker, water hammer arrestor and necessary electrical hardware; adjustable frequency and duration of priming and distribution splitter for multiple priming.

SS-1 Service Sink

Corner Mop Sink, 24" x 24" x 12" (610mm x 610 mm x 305mm) deep, floor mounted, Precast Terrazzo. One-piece stainless steel cast integral cap on all sides.

Integral Cast Brass Drain with S.S. strainer, 3" (75mm) outlet.

Faucet and Mop Hanger to remain. Provide new drain, drain connection and gasket. Provide 'p' Trap.

PART 3 EXECUTION

3.1 Installation

.1 Mounting heights:

.1 Standard: to comply with manufacturer's recommendations unless otherwise indicated or specified.

.2 Wall-hung fixtures: as indicated measured from finished floor.

.3 Physically handicapped: to comply with most stringent of either NBCC or CAN/CSA B651.

.2 For inmate areas, all gaps between fixtures, wall and floors are to be sealed with security caulking. Security caulking shall be two-part, non-sagging, chemically curing epoxy adhesive/sealant, specifically designed for use in interior security areas.

.3 For all other areas, all gaps between fixtures, wall and floors are to be sealed with silicone-based, mildew-resistant and low-VOC caulking compound, conforming to ASTM C920 Type S Grade NS Class 25.

.4 Caulking shall be made tight and beaded smooth in a neat and workmanlike manner

.5 Utilize security hardware and mounting plates provided with all security fixtures in areas accessible to inmates.

3.2 Supplies

.1 Provide isolation valves or stops for every fixture or appliance connection.

.2 Provide water hammer arrestors for flush valves and solenoid controlled appliances.

3.3 Adjusting

.1 Conform to water conservation requirements specified this section.

.2 Adjustments:

.1 Adjust water flow rate to design flow rates.

.2 Adjust pressure to fixtures to ensure no splashing at maximum pressures.

3.4 Performance Verification:

.1 PV procedures:

.1 Aerators: operation, cleanliness.

.2 Vacuum breakers, backflow preventers: operation under all conditions.

.3 Wash fountains: operation of flow-actuating devices.

.4 Thermostatic controls: Verify temperature settings, operation of control, limit and safety controls.

END OF SECTION

PART 1 GENERAL

1.1 Summary

.1 Section Includes:

.1 The supply and installation of Plumbing Specialties and Accessories.

.2 Products Installed but not Supplied Under this Section:

.1 Install rough-in for equipment supplied by others, complete with valves on hot and cold water supplies, waste and vent.

.2 Equipment installed by others.

.1 Connect with unions.

.3 Equipment not installed.

.1 Capped for future connection by others.

1.2 Related Section

.1	Section 01 11 55	General Instructions
.2	Section 01 35 33	Health and Safety Requirements
.3	Section 23 05 00	Common Work Results for Mechanical
.4	Section 23 08 01	Performance Verification Mechanical Piping Systems

1.3 References

.1 American Society for Testing and Materials (ASTM)

.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.

.3 ASTM B193-02(2008), Standard Test Method for Resistivity of Electrical Conductor Materials.

.2 American Water Works Association (AWWA)

.3 Canadian Standards Association (CSA)

.1 CAN/CSA-B64 Series-01 (2007), Backflow Preventers and Vacuum Breakers.

.2 CAN/CSA-C22.2 No. 130-03 (R2013), Requirements for Electrical Resistance Heating Cables and Heating Device Sets.

.3 CAN/CSA-B356-10, Water Pressure Reducing Valves for Domestic Water Supply Systems.

.4 Plumbing and Drainage Institute (PDI)

.1 PDI-WH201-2010, Water Hammer Arresters Standard.

.5 National Sanitation Foundation (NSF) / American National Standards Institute (ANSI).

.1 NSF/ANSI 61, Drinking Water System Components.

1.4 Submittals

.1 Submittals in accordance with Section 01 11 55 – General Instructions.

.2 Indicate, for all plumbing specialties and accessories:

.1 Dimensions, construction details, roughing-in dimensions.

1.5 Closeout Submittals:

.1 Submit maintenance data in accordance with Section 01 11 55 – General Instructions.

.2 Include:

.1 Description of plumbing specialties and accessories, giving manufacturer's name, type, model, year, capacity.

.2 Details of operation, servicing, maintenance.

.3 List of recommended spare parts.

1.6 Health and Safety

.1 Do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.

1.7 Delivery Storage and Disposal

.1 Waste Management and Disposal:

.1 Separate waste materials for recycling in accordance with Section 01 11 55 – General Instructions.

.2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan

.3 Fold up metal banding, flatten and place in designated area for recycling.

1.8 Quality Assurance

.1 All potable water system components shall conform to NSF/ANSI Standard 61.

PART 2 PRODUCTS

2.1 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 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 cast box with anchor lugs and:

.1 Plugs: bolted bronze with neoprene gasket.
.2 Cover for unfinished concrete floors: cast iron round gasket, vandal-proof screws.

.3 Cover for terrazzo finish: polished nickel bronze 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.

2.2 Water Hammer Arrestor

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

2.3 Back Flow Preventer

.1 To CSA-B64 Series. Approved for vertical-up installation.

.2 Application: as indicated.

2.4 Vacuum Breaker

.1 To CSA-B64 Series.

2.5 Pressure Regulator

.1 Capacity and performance:

.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.

2.6 Trap Seals Primer

.1 Brass, with integral vacuum breaker, NPS1/2 solder ends, NPS1/2 drip line connection. Activates upon 21 kPa [3 PSI] or less pressure drop.

2.7 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.

.3 NPS2 1/2 and over, cast iron body, flanged ends, with bolted cap.

2.8 Hose Bibbs and Sediment faucets

.1 Bronze construction complete with integral back flow preventer, hose thread spout, replaceable composition disc, and chrome plated in finished areas.

2.9 Circulation Pumps

.1 Provide circulating pumps where indicated, designed for quiet operation and guaranteed by the manufacturer for the intended operation.

.2 Hot water circulating pumps shall be suitable for pumping 100°C water.

.3 All pumps shall be fitted with mechanical shaft seals.

.4 Domestic water pumps shall be all bronze construction.

2.10 Balancing Fittings, for TAB:

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

.2 NPS 2 and under: Globe type, Y-pattern, bronze body, EPDM O-ring and NPT connections.

2.12 Grease Interceptor with Internal Storage Tank

.1 See fixture section.

2.13 Piping Freeze Protection Systems

.1 Complete CSA approved system of heaters and components, listed specifically for maintaining freeze protection for insulated piping at ambient to -40°C.

.2 The self-regulating heater shall consist of two (2) 16 AWG tinned-copper bus wires embedded in parallel in self-regulating polymer core specially designed for this application that varies its heat output all along its length, allowing the heater to maintain the water in the selected temperature range. The resistance shall be less than the heating cable bus wire resistance as determined in a type test per ASTM B193. The heater shall be covered by a radiation cross-linked modified polyolefin dielectric jacket.

.3 The heater shall operate on a single phase line voltage as noted.

.4 Provide power connection, end seal, splice, tee components and required accessories for field installation.

PART 3 EXECUTION

3.1 Installation

.1 Install in accordance with National Plumbing Code and local authority having jurisdiction.

.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 soil and waste stacks, and rainwater leaders.

.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.

3.3 Water Hammer Arrestor

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

3.4 Back Flow Preventers

.1 Install in accordance with CAN/CSA-B64 Series, where indicated and elsewhere as required by code.

.2 Pipe discharge to terminate over nearest drain and/ or service sink.

3.5 Hose Bibbs and Sediment Faucets

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

3.6 Trap Seal Primers

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

.2 Electronic trap primer with solenoid actuating device, vacuum breaker, water hammer arrestor and necessary electrical hardware; adjustable frequency and duration of priming and distribution splitter for multiple priming.

.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.

.4 Provide isolation valve with union connection at trap primer inlet. Provide air gap fitting at trap primer outlet.

.5 Take off to trap primer shall be at the top of water line to prevent debris from entering trap primers.

3.7 Balancing of Domestic Hot Water Recirculation Systems

.1 Refer to Section 23 05 93 - Testing, Adjusting and Balancing for HVAC for applicable procedures.

3.8 Piping Freeze Protection Systems

.1 Install self-regulating heater and components on rainwater leaders, water supply piping mains and risers as indicated in the plans and specifications after the piping has been pressure tested, but before the thermal insulation is applied. Secure the heater to piping with Raychem GT-66 fibreglass tape or approved equal.

.2 Apply "electric traced" signs to the outside of the thermal insulation.

.3 After installation and before and after installing the thermal insulation, test heater using a 1000 VDC megger. Minimum insulation resistance should be between 20 and 1000 megaohms regardless of length.

.4 Power connection to heater shall be provided by Division 26. Arrange with electrical contractor to perform and certify the megger test.

3.9 Performance Verification:

.1 General:

.1 In accordance with Section 23 08 01 – Performance Verification Mechanical Piping Systems.

.2 PV procedures:

.1 Vacuum breakers, circulating pumps: operation under all conditions.

.2 Thermostatic controls: Verify temperature settings, operation of control, limit and safety controls.

END OF SECTION