

2016-Jan-29

1 General

1.1 SHOP DRAWINGS AND PRODUCT DATA

- .1 Indicate:
 - .1 Equipment, including connections, fittings, control assemblies and ancillaries. Identify whether factory or field assembled.
 - .2 Wiring and schematic diagrams.
 - .3 Dimensions and recommended installation.
 - .4 Pump performance and efficiency curves.

1.2 MAINTENANCE DATA

- .1 Provide maintenance data for incorporation into manual specified in Section 01 10 01 – General Requirements.
- .2 Data to include:
 - .1 Manufacturers name, type, model year, capacity and serial number.
 - .2 Details of operation, servicing and maintenance.
 - .3 Recommended spare parts list with names and addresses.

2 Products

2.1 DOMESTIC HOT WATER CIRCULATING PUMPS (C-DHWR)

- .1 Capacity: 0.32 L/s against total differential head of 45 kPa.
- .2 Construction: replaceable cartridge type, in-line centrifugal, all bronze construction, stainless steel shaft, stainless steel or bronze shaft sleeve, two oil lubricated bronze sleeves or ball bearings. Design for 1035 kPa and 105°C continuous service.
- .3 Motor: 80 W, 115V/1Ø/60 Hz, TEFC, with thermal overload protection.
- .4 Acceptable Materials: Grundfos UPS15-58FC or approved equal.

3 Execution

3.1 INSTALLATION

- .1 Make piping and electrical connections to pump and motor assembly and controls as indicated.
- .2 Ensure pump and motor assembly do not support piping.
- .3 Install in accordance with manufacturer's recommendations.

3.2 COMMISSIONING

- .1 After start-up, test, adjust and prove operation of all equipment and accessories to suit site conditions and 01 91 13 General Commissioning Requirements.

END OF SECTION

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 American Society for Testing and Materials (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 10 01 – General Requirements.
- .2 Submit data for following: valves.

1.3 Maintenance Data

- .1 Provide maintenance data for incorporation into manual specified in Section 01 10 01 – General Requirements.

1.4 Potable Water Systems

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

1.5 Sustainable Design Submittals

- .1 Construction waste management plan.
 - .1 A Construction Waste Management Plan is in place to divert waste material from landfill. Wherever practical, send waste material for reuse or recycling, and generally document this for the contractor's waste management final report.
 - .2 Recycled Content.
 - .1 Refer to Section 01 47 15 - Sustainable Requirements for "List of Products Requiring Recycled Content".
 - .2 If products within this section are indicated on the "List of Products Requiring Recycled Content", only products with recycled content will be acceptable.
 - .3 For products not identified on list, source products with highest recycled content available when practical.
 - .4 Include following information with product data submission.
 - .1 Percentage of pre-consumer and post-consumer recycled content for each product.
 - .3 Regional Materials.
 - .1 Refer to Section 01 47 15 - Sustainable Requirements for "List of Products Required to be Locally Sourced".
 - .2 If products within this section are indicated on the "List of Products Required to be Locally Sourced", include following information with Product Data submission:
 - .1 Extraction/Manufacturing location(s): Indicate location of extraction site or manufacturing plant, and indicate distance between extraction site or manufacturing plant and Project site.
 - .4 Adhesives and Sealants.
 - .1 Include following information with Product Data submission for materials specified under this section:
 - .1 Submit manufacturer's certification indicating VOC limits of Products used onsite and within the building envelope. Product shall comply with California's SCAQMD #1168.
 - .5 Paints and Coatings.
 - .1 Provide low VOC Products as specified herein and complying with local regulations regarding toxic and hazardous materials.
 - .2 Ensure primers, paints and coatings used onsite and within building envelope meet or exceed requirements of following standards:
 - .1 Interior and Exterior Paints: GS-11
 - .2 Anti-Corrosive Paint: GS-11
 - .3 Clear Wood Finishes and other coating not covered in GS-11: SCAQMD #1113.
 - .3 Submit manufacturer's certification indicating VOC limits of Products.
 - .6 If requesting substitute product, ensure proposed substitution achieves above stated goals.

1.6 MAX. VOC CONTENT FOR SOLVENT CLEANING ACTIVITIES

- .1 Following are some of the Maximum allowed VOC Content for following activities, as per SCAQMD Rule 1171-9 (refer to SCAQMD manual for complete list and updates):
 - .1 Product cleaning during onsite surface preparation for coatings or adhesives application, and repair and maintenance cleaning:
 - .1 General maximum VOC 25g/L.
 - .2 Electrical apparatus components and electronic components.
 - .3 Cleaning of coatings or adhesives application equipment max. VOC 25g/L.
 - .2 Refer to SCAQMD for additional information and clarification and complete list of applications.
 - .3 Any discrepancies are to be approved by Departmental Representative. Obtain written approval prior to use on site.

2 Products

2.1 Domestic Water Piping And Fittings

- .1 Domestic hot, cold, and recirc 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.
 - .1 Acceptable Material: "Silvabrite 100"; Aquasol.
 - .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 Storm Drain Piping and Fittings – Cast Iron and PVC DWV
 - .1 Buried 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 DWV piping to:
 - .1 CAN/CSA-B181.2 for PVC DWV.
 - .2 Joints
 - .3 Solvent weld for PVC: to ASTM D2564.
 - .2 Above Ground 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.
- 2.5 Above Slab Radon Gas Vent Piping
 - .1 Rigid PVC pipe and fittings non-perforated to CSA-B181.2, schedule 40, complete with fittings and solvent welded joints.

- .2 Portions of PVC penetrating slabs or within building envelope to be flame spread rated to not greater than 25 and smoke developed classification to not greater than 50.
 - .3 Standard of Acceptance: Ipex System XFR
- 2.6 Below Slab Radon Gas Vent Piping
- .1 Rigid PVC pipe and fittings perforated to CSA-B182.1, SDR 35. Solvent weld joints.
- 2.7 Gate Valves
- .1 NPS 2 and under, soldered:
 - .1 Rising stem: to MSS SP-80, Class 125, 860 kPa bronze body, screw-in bonnet, solid wedge disc.
 - .2 Acceptable Material: Crane 1334; Jenkins 813J; Milwaukee 1169, Nibco.
 - .2 NPS 2 and under, screwed:
 - .1 Rising stem: to MSS SP-80, Class 125, 860 kPa bronze body, screw-in bonnet, solid wedge disc.
 - .2 Acceptable Material: Crane 428; Jenkins 810J; Milwaukee 1148, Nibco.
 - .3 NPS 2-1/2 and over, in mechanical rooms, flanged:
 - .1 Rising stem: to MSS SP-70, Class 125, 860 kPa flat flange faces, cast-iron body, OS&Y bronze trim.
 - .2 Acceptable Material: Crane 465½; Jenkins 454J; Milwaukee F-2885, Nibco.
 - .4 NPS 2-1/2 and over, other than mechanical rooms, flanged:
 - .1 Non-rising stem: to MSS SP-70, Class 125, 860 kPa flat flange faces, cast-iron body, bronze trim, bolted bonnet.
 - .2 Acceptable Material: Crane 461; Jenkins 452J; Milwaukee F-2882, Nibco.
 - .5 NPS 2-1/2 and over:
 - .1 In lieu of gate valves, roll grooved butterfly valves may be used when installed in a Victaulic copper roll grooved piping system.
 - .2 Standard of Acceptance: Victaulic Series 608 Butterfly Valves.
- 2.8 Globe Valves
- .1 NPS 2 and under, soldered:
 - .1 To MSS SP-80, Class 125, 860 kPa bronze body, renewable composition disc, screwed over bonnet.
 - .2 Lockshield handles: as indicated.
 - .3 Acceptable Material: Crane 1310; Jenkins 106BPJ; Milwaukee 1590-T, Nibco.
 - .2 NPS 2 and under, screwed:
 - .1 To MSS SP-80, Class 150, 1 MPa bronze body, screwed over bonnet, renewable composition disc.
 - .2 Lockshield handles: as indicated.
 - .3 Acceptable Material: Crane 7; Jenkins 106-BJ; Milwaukee 590-T, Nibco.

2.9 Swing Check Valves

- .1 NPS 2 and under, soldered:
 - .1 To MSS SP-80, Class 125, 860 kPa bronze body, bronze swing disc, screw in cap, regrindable seat.
 - .2 Acceptable Material: Crane 1342; Jenkins 4093J; Milwaukee 1509-T, Nibco.
- .2 NPS 2 and under, screwed:
 - .1 To MSS SP-80, Class 125, 860 kPa bronze body, bronze swing disc, screw in cap, regrindable seat.
 - .2 Acceptable Material: Crane 37; Jenkins 4092J; Milwaukee 509-T, Nibco.
- .3 NPS 2-1/2 and over, flanged:
 - .1 To MSS SP-71, Class 125, 860 kPa cast iron body, flat flange faces, renewable seat, bronze disc, bolted cap.
 - .2 Acceptable Material: Crane 373; Jenkins 587J; Milwaukee F-2974, Nibco.

2.10 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.
 - .3 Acceptable Material: Crane 9202; Jenkins 901BJ; Milwaukee BA-100; Watts B-6000-01, Nibco.
- .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 Acceptable Material: Crane 9222; Jenkins 902B; Milwaukee BA-150; Watts B-6001-01, Nibco.

2.11 Flow Balancing Valves - FB

- .1 General:
 - .1 Y style globe valve, designed to provide precise flow measurement and control, with valved ports for connecting to differential pressure meter.
- .2 Accuracy:
 - .1 Readout to be within plus or minus 2% of actual flow at design flow rate.
- .3 NPS 2 and under:
 - .1 Bronze or brass copper alloy (Ametal) construction; maximum WP: 1720 kPa; Max temp: 121°C screwed ends, Teflon disc, screwed in bonnet.
 - .2 Flow control: at least four (4) full turns of handwheel with digital hand wheel and tamperproof concealed mechanical memory.
 - .3 For flows less than 3.8 L/m use a reduced flow type unit.

- .4 NPS 2½ and over:
 - .1 Cast iron construction: bonnet and trim of bronze or brass alloy (Ametal); bonnet bolts of stainless steel maximum WP: 1720 kPa; Maximum temp: 121°C; ANSI Class 125 flanged ends.
 - .2 Flow control: At least 8 full turns of handwheel with vernier type ring settings and tamperproof concealed mechanical memory.
 - .5 Insulation: use prefabricated shipping packaging of 5.4 R polyurethane as insulation for installation.
 - .6 Drain connection:
 - .1 NPS ¾ valved and capped drain connection suitable for hose socket to be incorporated into the valve body or provided as separate item.
 - .7 Standard of Acceptance: B&G Circuit Setter Type “RF” for low flow applications and B&G Circuit Setter elsewhere, Armstrong, Danfoss, Oventrop.
- 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 FLOW BALANCING VALVES

- .1 Install flow balancing valves on DHWR lines as indicated on drawings.
- .2 Remove handwheel after installation and TAB is complete to satisfaction of the Departmental Representative.

3.5 BALANCING

- .1 Refer to Section 20 05 93 – Testing Adjusting and Balancing (TAB) of Mechanical Systems and Section 20 05 00 – Mechanical General Requirements.

3.6 TESTING

- .1 Test piping system before concealing. Contractor to conduct a ball test on all buried drainage piping systems including documentation witnessed by Departmental Representative. Notify the Departmental Representative 24 hours prior to testing. Test to National Plumbing Code.

END OF SECTION

1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA).
 - .1 CAN1-4.3-M85, Circulating Tank, Instantaneous and Large Automatic Storage Type Gas Water Heaters.
 - .2 CSA B51-90, Boiler, Pressure Vessel, and Pressure Piping Code.

1.2 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 10 01 - General Requirements.
- .2 Indicate:
 - .1 Equipment, including connections, fittings, control assemblies and ancillaries, identifying factory and field assembled.

1.3 MAINTENANCE AND DATA

- .1 Provide maintenance data for incorporation into manual specified in Section 01 10 01 - General Requirements.

2 Products

2.1 DOMESTIC WATER HEATERS (DWH-1, DWH-2)

- .1 Install electric water heater c/w safety relief valve, vacuum relief valve and drain pan as per the Departmental Representative.
- .2 Electric water heater with a 455 L storage capacity, an input of 36 kW, a recovery rate of 550 L/h at 56°C temperature rise, and be equipped for 600/3Ø/60Hz operation.
- .3 Tank shall have an industrial grade coating and insulated with 50 mm environmentally friendly polyurethane foam insulation. Tank shall have a working pressure rating of 1,034 kPa and shall be design certified by CSA.
- .4 Standard of Acceptance: Rheem Model EG-120-36, John Wood, Giant.
- .5 Trim and instrumentation.
 - .1 Drain valve: NPS 1 with hose end.
 - .2 ASME rated temperature and pressure relief valve sized for full capacity of heater, having discharge terminating over floor drain and visible to operators.
 - .3 Magnesium anodes adequate for 20 years of operation and located for easy replacement.

3 Execution

3.1 INSTALLATION

- .1 Install in accordance with manufacturer's recommendations and Departmental Representative.
- .2 Provide insulation between tank and supports.
- .3 Install with drain pans to National Plumbing Code.

3.2 COMMISSIONING

- .1 Confirm thermostat setting on tank.
- .2 Set domestic water heater's temperature controls to supply hot water at 60°C.

END OF SECTION

1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials (ASTM).
 - .1 ASTM A126-84, Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
 - .2 ASTM B62-90, Specification for Composition Bronze or Ounce Metal Castings.
- .2 American Water Works Association (AWWA).
 - .1 ANSI/AWWA C700-77, Cold Water Meters - Displacement Type.
 - .2 ANSI/AWWA C7011-88, Cold Water Meters - Turbine Type for Customer Service.
 - .3 ANSI/AWWA C702-86, Cold Water Meters - Compound Type.
- .3 Canadian Standards Association (CSA).
 - .1 CAN/CSA-B64 Series-M88, Backflow Preventers and Vacuum Breakers.
 - .2 CAN/CSA-B64.10-M88, Backflow Prevention Devices - Selection, Installation Maintenance and Field Testing.
 - .3 CAN3-B79-M79, Floor Drains and Trench Drains.
- .4 Plumbing & Drainage Institute (PDI)
 - .1 PDI-WH201-77, Water Hammer Arrestors.

1.2 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 10 01 – General Requirements.
- .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 10 01 – General Requirements.
- .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 Tamperproof floor drain strainer and clean out screws to be secured with Locktite Liquid Thread Lockers Series 262. Snake eye type tamperproof screws or those that cannot be reversed with the proper tools are not acceptable.
- .3 FD1: general duty, cast iron body 127 mm round, adjustable head, nickel bronze strainer, integral seepage pan, clamping collar and trap primer connection. Tamperproof floor drain strainer screws. Maximum 12 mm openings on strainer.
 - .1 Approved Product: Zurn ZN-415-B5-P-VP (No Substitutions).

- .4 FD2: general duty, cast iron body 127 mm round, adjustable extended rim nickel bronze strainer, integral seepage pan, clamping collar and trap primer connection. Tamperproof floor drain strainer screws. Maximum 12 mm openings on strainer.
 - .1 Approved Product: Zurn ZN-415-I-P-VP.
- .5 FD3: combination funnel floor drain, cast iron body with integral seepage pan, clamping collar, nickel-bronze 127 mm adjustable head strainer with integral funnel and trap primer connection. Tamperproof floor drain strainer screws. Maximum 12 mm openings on strainer.
 - .1 Approved Product: Zurn ZN-415-BF-P-VP.
- .6 FD4: general duty, cast iron body 127 mm round, adjustable head, nickel bronze strainer, integral seepage pan, clamping collar and trap primer connection. Tamperproof floor drain strainer screws. Maximum 12 mm openings on strainer.
 - .1 Approved Product: Zurn ZN-415-B5-P-VP.

2.2 CLEANOUTS (CO)

- .1 Cleanout plugs: heavy cast iron male ferrule with brass screws and threaded brass or bronze plug. Sealing-caulked lead seat or neoprene gasket. Tamperproof screws.
 - .1 Approved Product: Zurn Z-1440, Mifab, Jay R. Smith.
- .2 Access covers:
 - .1 Wall access: face or wall type, polished nickel bronze or stainless steel square cover with flush head securing screws, bevelled edge frame complete with anchoring lugs. Tamperproof screws.
 - .1 Standard of Acceptance: Zurn ZANB-1460 Series, Mifab, Jay R. Smith.
- .3 Floor cleanouts: (Use cover to match floor type and general use type for unfinished floors). Install with tamperproof screws.
 - .1 General use cleanouts, cast iron body, interior seal plug, adjustable polished nickel bronze head and gasketed, secured, scoriated cover.
 - .1 Standard of Acceptance: Zurn ZN-1400, Mifab, Jay R. Smith.
 - .2 For terrazzo floors same as general use except with cover for terrazzo floors.
 - .1 Standard of Acceptance: Zurn ZN-1400-Z, Mifab, Jay R. Smith.
 - .3 For tile or linoleum floors same as general use except with cover for tile floors.
 - .1 Standard of Acceptance: Zurn 1400-X, Mifab, Jay R. Smith.
 - .4 For carpeted floors same as general use except with cover for carpeted floors.
 - .1 Standard of Acceptance: Zurn 1400-CM, Mifab, Jay R. Smith.
 - .5 Heavy duty use cleanouts, cast iron body, interior seal plug, adjustable polished nickel bronze head and gasketed cover, secured, scoriated 13 mm thick, heavy duty cover.
 - .1 Standard of Acceptance: Zurn Z-1400, Mifab, Jay R. Smith.

2.3 NON FREEZE WALL HYDRANTS (HB)

- .1 HB: Encased recessed with integral vacuum breaker, NPS 3/4 hose outlet, removable operating key, hinged cover with operating key lock. Polished bronze finish.
 - .1 Standard of Acceptance: Zurn 1300-CL, Mifab, Jay R. Smith.

2.4 WATER HAMMER ARRESTORS (S)

- .1 Stainless steel bellows or copper piston construction: to PDI-WH 201.
 - .1 Standard of Acceptance: Zurn Series 1700 bellows or Series 1705 piston; J.R. Smith Series 5000 bellows; Ancon Series SG bellows and piston; Enpoco Series HT bellows and Series HTW piston; Precision Plumbing Products Series SC.

2.5 BACKFLOW PREVENTERS (BFP)

- .1 To CAN/CSA-B64 Series.
- .2 BFP-1: Reduced pressure principal backflow preventer.
 - .1 Standard of Acceptance: Watts 009QT, Wilkins, Conbraco.

2.6 VACUUM BREAKERS (VB)

- .1 To CAN/CSA-B64 Series.
- .2 Atmospheric vacuum breaker:
 - .1 Standard of Acceptance: Watts 288A, Zurn, Febco.

2.7 TRAP PRIMER STATION (TPS)

- .1 Prime floor drain traps with cold water using Precision Plumbing Products trap primer c/w air gap filling and distribution to suite.
 - .1 Standard of acceptance: MyFab

2.8 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.
 - .1 Acceptable Material: Armstrong F4SC; Leitch BE; Spirax BT; Watts 777 Series.
- .3 NPS 2 ½ and over, cast iron body, flanged ends, with bolted cap.
 - .1 Acceptable Material: Armstrong F4FL; Leitch 528 pipeline basket type; Spirax Fig 3; Watts 77F Series.

2.9 WASHER BOX (WB)

- .1 Single lever, recessed in cabinet with stops on hot and cold supplies.
- .2 Standard of Acceptance: Zurn Z-2961, Watts, Oatey #38540.

2.10 DOMESTIC HOT WATER EXPANSION TANK (ET1)

- .1 Pressurized diaphragm steel expansion tank rated for maximum pressure of 1034 kPa and maximum temperature of 115°C. Tank volume: 18.9 litres. Minimum acceptance volume of 11.7 litres.
- .2 Standard of Acceptance: Watts Deta-12, Amtrol, Watts, ITT, Zurn.

2.11 WATER METER

- .1 Water meter c/w strainer shall be supplied by the Town of Saint-Léonard. Contractor shall retrieve and install water meter c/w strainer. NPS 2 water meter for use with potable water systems. Standard of Acceptance: Neptune TRU/FLO Series.
- .2 Contractor shall provide an interface between the water meter and the building management system for batching processes, monitoring flow totalization, and/or flow rate data. Standard of Acceptance: Neptune TRICON/E3 Transmitter.

2.12 HUB DRAIN (HD)

- .1 Hub floor drain, size 150 mm, Dura-Coated cast iron body with bottom outlet, combination invertible membrane clamp and adjustable collar with "Type S" circular adjustable hub drain (extend 300 mm above floor) and trap primer tapping.
 - .1 Standard of Acceptance: Zurn ZN-415-S-P-U-6NH, Mifab, Jay R. Smith.

2.13 THERMOSTATIC MIXING VALVE (TMV)

- .1 Dual thermostatic controllers in a surface mounted cabinet with dial thermometers, checkstops, pressure reducing valve, pressure gauges, shut-off valves on tempered water, 38 mm Ø bottom supplies, 38 mm Ø top outlet, setting to be 60°C, pressure drop to be 34 Kpa at 113 L/min, rough brass construction. Cabinet to be 18 ga. Cold rolled steel with baked enamel finish on inside and outside surfaces. Unit is to be capable of proper operation down to a flow rate of 2 L/min.
 - .1 Standard of Acceptance: Symmons Temp Control 7-900B-102-PRV-M.

2.14 PRESSURE REDUCING VALVE (PRV)

- .1 High capacity water pressure reducing valve. Outlet pressure setting 345 kPa. Bronze body or iron construction suitable for use in a potable water system.
 - .1 Standard of Acceptance: Watts Model 223, Zurn, Wilkins, Nibco, Ross.

2.15 ROOF DRAIN (RD)

- .1 Dura-coated cast iron body roof drain suitable for conventional roof arrangement c/w deck clamps, insulated sump receiver, and secured cast iron dome.
 - .1 Standard of Acceptance: Zurn ZC-121-4NH-DP, Jay R Smith, Mifab.

2.16 HOSE VALVE (HV)

- .1 Brass construction hose bibb faucet, 20mm (3/4") hose connection c/w vacuum breaker where indicated.

Standard of Acceptance: Emco Model #10241, Nibco.

2.17 BACKWATER VALVE (BWV)

- .1 PVC backwater valve (150mm) complete with access box. Installation to be lid flush with floor.
 - .1 Standard of Acceptance: Mainline Model ML-SF668 and PE-2013, Canplas.

3 Execution

3.1 INSTALLATION

- .1 Install in accordance with National Plumbing Code and local Departmental Representative 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 NON FREEZE WALL HYDRANTS

- .1 Install 600 mm above finished grade unless otherwise indicated.

3.4 WATER HAMMER ARRESTORS

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

3.5 BACKFLOW PREVENTERS AND VACUUM BREAKERS

- .1 Install in accordance with CSA B64.10, where indicated and elsewhere as required by code.
- .2 Install as required for proper functioning of equipment and/or systems.
- .3 Pipe discharge to over nearest drain.

3.6 HOSE BIBBS AND SEDIMENT FAUCETS

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

3.7 TRAP SEAL PRIMERS

- .1 Install for all floor drains and elsewhere, as indicated.
- .2 Install on cold water supply as indicated, in concealed space, to approval of the Departmental Representative. Provide strainer on upstream side of valve; serviceable from valve access door.

3.8 STRAINERS

- .1 Install with sufficient room to remove basket.

3.9 COMMISSIONING

- .1 After start-up, test, adjust and prove operation of all equipment and accessories to suit site conditions including but not limited to:
 - .1 Clean out strainers periodically until clear.
 - .2 Clean out and prime all floor drain traps using trap seal primers or other means acceptable to the National Plumbing Code.
 - .3 Prove freedom of movement of cleanouts. Cleanouts covers of clean-outs and floor drain strainers.
 - .4 Backflow preventers: confirm operation of backflow preventers and vacuum breakers, with test procedures in accordance with CSA B64.10 and Departmental Representative.
 - .5 Thermostatic mixing valves: Verify in writing maximum temperature settings as specified for each valve.
 - .6 Maximum temperature settings to be verified using a digital thermometer.

END OF SECTION

1 General

1.1 References

- .1 Canadian Standards Association (CSA).
 - .1 CAN/CSA-B45 Series-88, CSA Standards on Plumbing Fixtures.
 - .2 CAN/CSA-B125-M89, Plumbing Fittings.

1.2 PRODUCT DATA

- .1 Submit product data in accordance with Section 01 10 01 – General Requirements.
- .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 10 01 – General Requirements.
- .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 CAN/CSA-B125.
- .7 All fixtures used shall be CSA approved.

2 Products

2.1 WATER CLOSETS

- .1 WC: Water closet, 4.8 Lpf .
 - .1 Bowl: White vitreous china, wall-mounted, elongated, 381 mm floor to top of bowl, 38 mm back spud, MaP rating of 1000.
 - .1 Standard of Acceptance: American Standard Aflow FloWise 3353.001, Zurn, Kohler.
 - .2 Flush valve: Electronic operated back spud.
 - .1 Standard of Acceptance: Teck 1600T6103RI/TR, Sloan, American Standard.

- .3 Seat: Elongated, open front moulded solid plastic, less cover, SS check hinge, posts, washers and nuts.
 - .1 Standard of Acceptance: Bemis C1955SS, Olsonite, Conteco.
- .4 Fixture carrier: Adjustable, vertical siphon jet water closet support system, cast iron universal floor-mounted foot supports, faceplate, gasket, etc.
 - .1 Standard of Acceptance: Zurn Z-1208-N32, Mifab MC-14-3-2V, Jay R. Smith Fig. 0532FY.
- .2 WC1: Barrier free water closet, 4.8 L.
 - .1 Bowl: White vitreous china, wall-mounted, elongated, 432 mm floor to top of bowl, 38 mm back spud, MaP rating of 1000.
 - .1 Standard of Acceptance: American Standard AFWall FloWise 3353.001, Zurn, Kohler.
 - .2 Flush valve: Electronic operated back spud.
 - .1 Standard of Acceptance: Teck 1600T6103RI/TR, Sloan, American Standard.
 - .3 Seat: Elongated, open front moulded solid plastic, less cover, SS check hinge, posts, washers and nuts.
 - .1 Standard of Acceptance: Bemis C1955SS, Olsonite, Conteco.
 - .4 Fixture carrier: Adjustable, vertical siphon jet water closet support system, cast iron universal floor-mounted foot supports, faceplate, gasket, etc.
 - .1 Standard of Acceptance: Zurn Z-1208-N32, Mifab MC-14-3-2V, Jay R. Smith Fig. 0532FY.
- .3 WC2: Barrier free water closet, 4.8 L.
 - .1 Bowl: White vitreous china, wall-mounted, elongated, 432 mm floor to top of bowl, 38 mm top spud, MaP rating of 1000.
 - .1 Standard of Acceptance: American Standard AFWall FloWise 3351.001, Zurn, Kohler.
 - .2 Flush valve: Manual operated top spud.
 - .1 Standard of Acceptance: Teck 81T201, Sloan, American Standard.
 - .3 Seat: Elongated, open front moulded solid plastic, less cover, SS check hinge, posts, washers and nuts.
 - .1 Standard of Acceptance: Bemis C1955SS, Olsonite, Conteco.
 - .4 Fixture carrier: Adjustable, vertical siphon jet water closet support system, cast iron universal floor-mounted foot supports, faceplate, gasket, etc.
 - .1 Standard of Acceptance: Zurn Z-1208-N32, Mifab MC-14-3-2V, Jay R. Smith Fig. 0532FY.
- .4 WC3: Water Closet, 4.8 L.
 - .1 Bowl: White vitreous china, floor mounted, elongated rim, close coupled, bolt caps, 381 mm floor to top of bowl, MaP rating of 1000.
 - .2 Flush tank: White vitreous china, flapper type flush valve assembly, lined tank.
 - .1 Standard of Acceptance: American Standard Cadet 3 FloWise #2832.128, Zurn, Kohler.
 - .3 Seat: Elongated, open front moulded solid plastic, less cover, SS check hinge, posts, washers and nuts.
 - .1 Standard of Acceptance: Bemis C1955SS, Olsonite, Conteco.

- .4 Stops: Lockshield screw driver angle stop c/w flexible stainless steel riser, chrome plated nipple and S.S. wall flange.
 - .1 Standard of Acceptance: Teck 47T1316SD, Powers Crane P4212, McGuire H166LK-N3.

2.3 LAVATORIES

- .1 CL1: Barrier free, white vitreous china, oval self-rimming countertop basin, three holes, 100 mm centers, rear overflow and rear outlet.
 - .1 Standard of Acceptance: American Standard "Mezzo" #9960-403, Crane, Zurn.
 - .2 Trim: Supply fitting to be solid cast brass body with vandal resistant 1.9 L outlet (factory setting to be site adjusted to 15 seconds). Waste to be offset cast plug with open grid strainer. Trap to be cast brass adjustable P-trap with cleanout, covering system conforming to Barrier-Free requirements.
 - .1 Standard of Acceptance:

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|-----------------|---|
| Faucet: | Delta 591T02258. |
| Supply fitting: | Teck, Powers, Crane, Sloan, Moen. |
| Waste fittings: | Teck 33T290, Powers Crane P3906, McGuire 155WC, Zurn. |
| Trap: | Teck 33T311, Powers Crane P4001, McGuire 8872, Zurn. |
| Pipe Covers: | Truebro #103, Zurn. |
- .2 CL2: Barrier free, white vitreous china, semi-countertop basin, self-rimming, recessed self-draining deck, three holes, 100 mm centers, rear overflow and rear outlet.
 - .1 Standard of Acceptance: American Standard "Mezzo" #9960-403, Crane, Zurn.
 - .2 Trim: Supply fitting to be solid cast brass body with vandal resistant 1.9 L outlet. Supply stops on hot and cold water to be heavy pattern, cast body wheelchair 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, covering system conforming to Barrier-Free requirements.
 - .1 Standard of Acceptance:

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|-----------------|--|
| Faucet: | Delta 21T153. |
| Supply fitting: | Teck, Powers, Crane, Sloan, Moen. |
| Stops: | Teck 47T2412SD, Powers Crane P4252, McGuire H165LK-N5, Zurn. |
| Waste fittings: | Teck 33T290, Powers Crane P3906, McGuire 155WC, Zurn. |
| Trap: | Teck 33T311, Powers Crane P4001, McGuire 8872, Zurn. |
| Pipe Covers: | Truebro #103, Zurn. |
| Mixing Valve: | Lawler TMM-1070. |
- .3 L: 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 wall hanger. Size approximately 470mm x 430 mm.
 - .1 Standard of Acceptance: American Standard "Declyn" #0321-026, Crane, Zurn.

- .2 Trim: Supply fitting to be solid cast brass body with vandal resistant 1.9 L outlet. Supply stops on hot and cold water to be heavy pattern, cast body wheelchair stops c/w flexible braided stainless steel risers. Waste to be cast plug with open grid strainer. Trap to be cast brass adjustable P-trap with cleanout.
- .1 Standard of Acceptance:
- | | |
|-----------------|--|
| Faucet: | Delta 21T153. |
| Supply fitting: | Teck, Powers, Crane, Sloan, Moen. |
| Stops: | Teck 47T2412SD, Powers Crane P4252, McGuire H165LK-N5, Zurn. |
| Waste fittings: | Teck 33T290, Powers Crane P3906, McGuire 155WC, Zurn. |
| Trap: | Teck 33T311, Powers Crane P4001, McGuire 8872, Zurn. |
| Mixing Valve: | Lawler TMM-1070. |

2.4 URINALS

- .1 U: Wall mounted low flow urinal, 1.9 Lpf .
- .1 Urinal: Vitreous china c/w 20 mm top spud, outlet flange and rubber gasket, vandal resistant outlet strainer and flush valve. Colour: white.
- .1 Acceptable products: American Standard Washbrook 6515.005, Crane, Kohler.
- .2 Flush Valve: Electronic flush valve c/w proximity system for hands free operation, fully mechanical manual override, failsafe operation, adjustable sanitary flush capable of accepting 24V AC power supply.
- .1 Acceptable Products: Delta 1000T9001 R1/TR, American Standard Selectronic, Sloan.
- .3 Urinal Carrier with welded steel integral foot support, heavy tubular uprights and heavy gauge supporting plates.
- .1 Acceptable Products: Zurn ZX-1221, J.R. Smith, Ancon.
- .4 Wall access element with round stainless steel cover.
- .1 Acceptable Products: J.R. Smith SQ-1819 wall access cleanout.
- .5 Plastic drainage piping required at drains per National Building Code.
- .6 Mounting Heights:
- .1 U: Height to be 610 mm.

2.5 STAINLESS STEEL COUNTERTOP SINKS

- .1 CS: Single compartment, ledgeback, drilled to accept a two handled 100 mm centerset, type 302 stainless steel, 1 mm thick, self rimming, undercoated, countertop installation with clamps, integral stainless steel basket strainers/ stoppers, tailpieces.
- .1 Sizes: approximate OD 520 mm x 510 mm x 200 mm.
- .1 Standard of Acceptance: Kindred LBS6808-1/3.
- .2 Trim: chrome plated brass, heavy duty gooseneck spout with 76 mm blade handles, supply stops on hot and cold.
- .1 Standard of Acceptance:
- | | |
|-----------------|-------------------|
| Supply fitting: | Teck 27T4933-LS. |
| Stops: | Teck 47T 2512 SD. |

Waste fittings: Teck 33T360.

- .2 CS1: Single compartment, counter/sink combination (supplied and installed by Division 06), drilled to accept a two handled 100 mm centerset, integral stainless steel basket strainers/stoppers, tailpieces.
- .1 Trim: chrome plated brass, heavy duty tubular spout with 76 mm blade handles, supply stops on hot and cold.
- .1 Standard of Acceptance:
- Supply fitting: Teck 26T3233-LS.
- Stops: Teck 47T 2512 SD.
- Waste fittings: Teck 33T360.
- .3 CS2: Single compartment, ledgeback, drilled to accept a two handled 200 mm centerset, type 302 stainless steel, 1 mm thick, self rimming, undercoated, countertop installation with clamps, integral stainless steel basket strainers/stoppers, tailpieces.
- .1 Sizes: approximate OD 440 mm x 600 mm x 300 mm.
- .1 Standard of Acceptance: Kindred LBS7312P-1/3.
- .2 Trim: chrome plated brass, heavy duty tubular spout with 76 mm blade handles, supply stops on hot and cold.
- .1 Standard of Acceptance:
- Supply fitting: Teck 26T3233-LS.
- Stops: Teck 47T 2512 SD.
- Waste fittings: Teck 33T360.

2.6 EMERGENCY EYE WASH (EEW)

- .1 Barrier free concealed eyewash, stainless steel flush mounted cabinet and door, halo eye wash activated by pulling the door down, vandal resistant ceramic valve, mesh strainer. brass p-trap with tailpiece, ½" NPT inlet, 32 mm outlet. Locking device on bottom portion of cabinet to conceal waste and fittings. Gas spring on swing down top door. Handle is to be removed from unit and replaced with a knob. Install knob with vandal resistant screw using permanent Loctite.
- .1 Standard of Acceptance: Bradley S19294HBT Approved Product (No Substitutions).
- .2 Eye wash will be complete with tempered water unit (TWU-2). Thermostatic mixing valve to supply 4-45 L/min at 27°C to emergency eye washes. Unit to be c/w, inlet/outlet check valves, isolation ball valves, and lockable recessed stainless steel cabinet.
- .1 Standard of Acceptance: Bradley S19-2000, Haws, Lawler, Acorn.

2.7 JANITORS SINKS (JS)

- .1 JS1: Precast 813 mm x 813 mm x 305 mm high terrazzo base, integral 1,200 mm high stainless steel wall guards, chrome plated brass drain body and stainless steel caps on all sides.
- .1 Standard of Acceptance: Fiat TSBC-1611, Williams, Zurn.
- .2 Trim: Faucet with wall brace, cross indexed handles, pail hook, hose outlet, integral stops, vacuum breaker and escutcheons, polished chrome plated finish.
- .1 Standard of Acceptance: Williams T-15-VB, Teck 28T2384, Chicago 540-LD-8975-WXF.

- .3 Accessories: Minimum 760 mm long rubber hose with brass coupling and stainless steel hose bracket. Stainless steel mop hanger with 3 rubber spring loaded grips.
 - .1 Standard of Acceptance:
 - .1 Hose and bracket: Fiat #832-AA, Williams T-35, Teck 28T911.
 - .2 Mop hanger: Fiat #889-CC, Williams T-40, Teck 28T910.

2.8 SHOWER HEADS AND VALVES

- .1 SH:
 - .1 Shower head and valve: Head to have 5.7 L/min maximum flow with brass ball, valve to have pressure balancing cartridge, adjustable hot water limit stop, lever blade handle, and adjustable stop screw. Set limit to 40°C maximum water temperature. Integral service stops required.
 - .1 Standard of Acceptance: Delta T13H183, Symmons, Bradley, Zurn, Chicago.
- .2 SH1:
 - .1 Shower head: hand-held shower head with 610 mm stainless steel combination slide/grab bar for wall mounting, flexible metal hose c/w vacuum breaker, wall connection flange. Anchor plates for mounting on concrete block walls, vandal resistant. Maximum flow of 6 L/m.
 - .2 Valve: pressure balance cartridge adjustable hot water limit stop, lever handle, integral checks and screwdriver stops, and polished chrome finish. Set limit to 40°C maximum water temperature.
 - .1 Standard of Acceptance: Delta T17TH155, Symmons, Bradley, Zurn, Chicago.
- .3 SH2:
 - .1 Shower head and valve: Head to be standard stainless steel non-adjustable penal shower head. Valve to be pressure balance located in front mounted recessed stainless steel panel. Set limit to 40°C maximum water temperature.
 - .1 Approved Product, No Substitutions : Acorn Penal-Ware 1741-FA-3-CSH-PBH.

2.9 WATER CLOSET/LAVATORY PENAL (WC/L)

- .1 Combination water closet/lavatory shall be ligature (suicide) resistant, 450mm (18") wide, all stainless steel construction (14 gauge, type 304), floor mounted, angled left or right toilet orientation, elongated bowl with contoured seat, integral crevice-free self-draining flushing rim, fully enclosed drain trap, blowout type flush action, stainless steel anti-suicide penal filler/bubbler, slow drain with air vent and dual temperature water supply. Refer to drawing 2200-1 for orientation.
- .2 Flush valve to be anti-suicide push button with 5.0 LPF (1.28 GPF).
- .3 Model shall meet the requirements of ASME A112.19.3/CSA B45.4.
- .4 Standard of Acceptance: Willoughby ECW-1806-L/R-ON-BPH-1.28-PSL2-PBH-EB-TWE-TWC3P-FV-FVT-WS Approved Product (No Substitutions).

2.10 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.

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

END OF SECTION