

**Part 1            General**

**1.1                SUMMARY**

- .1    Section Includes:
  - .1    Materials and installation for plumbing pumps.
  - .2    Sustainable requirements for construction and verification.

**1.2                REFERENCES**

- .1    Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1    Material Safety Data Sheets (MSDS).

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1    Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2    Coordinate submittal requirements and provide submittals required by Section 01 47 15 - Sustainable Requirements: Construction.
- .3    Product Data:
  - .1    Submit manufacturer's printed product literature, specifications and data sheet for fixtures and equipment.
  - .2    Submit WHMIS MSDS in accordance with Section 01 47 15 - Sustainable Requirements: Indicate VOC's for adhesive and solvents during application and curing.
- .4    Shop Drawings.
  - .1    Submit shop drawings to 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.
- .5    Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .6    Instructions: submit manufacturer's installation instructions.
- .7    Manufacturers' Field Reports: manufacturers' field reports specified.
- .8    Closeout submittals: submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals, 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.

#### **1.4 QUALITY ASSURANCE**

- .1 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety.
- .2 Construction requirements: in accordance with Section 01 47 15 - Sustainable Requirements: Construction.
- .3 Verification: contractor's verification in accordance with Section 01 47 15 - Sustainable Requirements.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Store and manage hazardous materials in accordance with Section 01 47 15 - Sustainable Requirements: Construction.
- .1 Waste Management: In accordance with 01 74 21 Construction Waste Management.

### **Part 2 Products**

#### **2.1 MATERIALS**

- .1 Materials and resources in accordance with Section 01 47 15 - Sustainable Requirements: Construction.

#### **2.2 SUMP PUMP SUBMERSIBLE, SP-1 & SP-2:**

- .1 Performance: 50 usgpm at 30 ft of head, ½ motor HP, 115V/1ph, 3450 RPM.
- .2 Pumps shall be epoxy coated cast iron construction, have motors that are oil filled, hermetically sealed and equipped with automatic reset and thermal overload protection. Unit shall include upper and lower ball bearings, stainless steel motor shaft, dual mechanical shaft seals (upper carbon/ceramic, lower silicon carbide/carbon), viton o-rings seals and cover gasket, non-clogging bronze vortex impeller passes ¾" spherical solids, 25 ft UL listed 3-wire neoprene cord and plug, stainless steel screws, bolts and handle, 2" NPT discharge and corrosion resistant powder coat epoxy finish.
- .3 Provide a sump pump control panel with the following features:
  - .1 Disconnect Switch
  - .2 Thermomagnetic Motor Protectors
  - .3 Across The Line Contactors
  - .4 Control Transformer c/w Secondary Fuse
  - .5 1 only Power on Pilot Light
  - .6 2 only 'Run' Pilot Lights
  - .7 2 only H-O-A Selector Switches
  - .8 4 Float Switches, 30 Ft Cable
  - .9 Automatic Transfer to Non Operating Pump on Motor Overload or Short Circuit
  - .10 Electric Alternating Relay
  - .11 Nema 1 Enclosure
  - .12 High Level Alarm Buzzer, c/w Silencer and Pilot Light
  - .13 High Level Alarm Relay for Signal

- .4 Provide rail system with pump suspended by means of a sealed pump plate attached to the pump. Rail and guide brackets shall be SS. Provide rail pipes and lifting cables as required for a complete guide rail system
- .5 Acceptable Product: "Zoeller" series 6160 model 6161 sump pumps and "Nothart" model NES-SPS/2x.50/3/60 control panel.  
Acceptable Equals: "Bell & Gossett"

**2.3 TEMPERED WATER RETURN CIRCULATING PUMP, PU-9:**

- .1 Performance: 4 gpm at 17 ft of head, 1/6 HP motor, 115V/1ph/60Hz, 1.9 FLA and 1725 RPM motor.
- .2 Pumps shall be suitable for potable water use and be constructed as follows:
  - .1 Body: Lead-free bronze
  - .2 Seal: Mechanical, carbon on ceramic
  - .3 Shaft: carbon steel, heat treated
  - .4 Impeller: lead free brass
  - .5 Flange size: 1.5" (38 mm)
- .3 The pump shall be of the horizontal, oil lubricated type specifically designed for quiet operation and suitable for 125 psi (862 kPa) working pressure.
- .4 The pumps shall have a ground and polished steel shaft with a hardened integral thrust collar. The shaft shall be supported by two horizontal sleeve bearings designed to circulate oil. The pumps are to be equipped with a mechanical seal with carbon seal face rotating against a ceramic seat. The motor shall be non-overloading at any point on pump curve.
- .5 The motor shall be of the drip-proof, sleeve bearing, quiet operating, rubber mounted construction. Motors shall have built in thermal overload protectors.
- .6 Acceptable Product: "Bell & Gossett" Series PR.

**2.4 DOMESTIC HOT WATER CIRCULATING PUMP, PU-10:**

- .1 Performance: 5 gpm at 23 ft of head, 1/3 HP motor, 115V/1ph/60Hz, 5.5 FLA and 1725 RPM motor.
- .2 Pumps shall be suitable for potable water use and be constructed as follows:
  - .1 Body: Lead-free bronze
  - .2 Seal: Mechanical, carbon on ceramic
  - .3 Shaft: carbon steel, heat treated
  - .4 Impeller: lead free brass
  - .5 Flange size: 3" (76 mm)
- .3 The pump shall be of the horizontal, oil lubricated type specifically designed for quiet operation and suitable for 125 psi (862 kPa) working pressure.
- .4 The pumps shall have a ground and polished steel shaft with a hardened integral thrust collar. The shaft shall be supported by two horizontal sleeve bearings designed to circulate oil. The pumps are to be equipped with a mechanical seal with carbon seal face rotating against a ceramic seat. The motor shall be non-overloading at any point on pump curve.

- .5 The motor shall be of the drip-proof, sleeve bearing, quite operating, rubber mounted construction. Motors shall have built in thermal overload protectors.
- .6 Acceptable Product: "Bell & Gossett" model PD-35S.

### **Part 3 Execution**

#### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

#### **3.2 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 Align vertical pit mounted pump assembly after mounting and securing cover plate.
- .4 Place [150] mm sand under sump pit tank.

#### **3.3 FIELD QUALITY CONTROL**

- .1 Site Tests/Inspection:
  - .1 Check power supply.
  - .2 Check starter protective devices.
- .2 Start-up, check for proper and safe operation.
- .3 Check settings and operation of hand-off-auto selector switch, operating, safety and limit controls, audible and visual alarms, over-temperature and other protective devices.
- .4 Adjust flow from water-cooled bearings.
- .5 Adjust impeller shaft stuffing boxes, packing glands.
- .6 Verification requirements in accordance with Section 01 47 15 - Sustainable Requirements: Construction, include:
  - .1 Materials and resources.
  - .2 Storage and collection of recyclables.
  - .3 Construction waste management.
  - .4 Resource reuse.
  - .5 Recycled content.
  - .6 Local/regional materials.
  - .7 Certified wood.
  - .8 Low-emitting materials.

#### **3.4 START-UP**

- .1 General:

- .1 In accordance with Section 01 91 13 - General Commissioning (Cx) Requirements: General Requirements, supplemented as specified herein.
- .2 Procedures:
  - .1 Check power supply.
  - .2 Check starter O/L heater sizes.
  - .3 Start pumps, check impeller rotation.
  - .4 Check for safe and proper operation.
  - .5 Check settings, operation of operating, limit, safety controls, over-temperature, audible/visual alarms, other protective devices.
  - .6 Test operation of hands-on-auto switch.
  - .7 Test operation of alternator.
  - .8 Adjust leakage through water-cooled bearings.
  - .9 Adjust shaft stuffing boxes.
  - .10 Adjust leakage flow rate from pump shaft stuffing boxes to manufacturer's recommendations.
  - .11 Check base for free-floating, no obstructions under base.
  - .12 Run-in pumps for 12 continuous hours.
  - .13 Check installation, operation of mechanical seals, packing gland type seals. Adjust as necessary.
  - .14 Adjust alignment of piping and conduit to ensure full flexibility.
  - .15 Eliminate causes of cavitation, flashing, air entrainment.
  - .16 Measure pressure drop across strainer when clean and with flow rates as finally set.
  - .17 Replace seals if pump used to degrease system or if pump used for temporary heat.
  - .18 Verify lubricating oil levels.

### **3.5 REPORTS**

- .1 In accordance with Section 01 91 13 - General Commissioning (Cx) Requirements: reports, supplemented as specified.
- .2 Include:
  - .1 PV results on approved PV Report Forms.
  - .2 Product Information report forms.
  - .3 Pump performance curves (family of curves) with final point of actual performance.

### **3.6 TRAINING**

- .1 In accordance with Section 01 91 13 - General Commissioning (Cx) Requirements: Training of O M Personnel, supplemented as specified.

**END OF SECTION**

**Part 1 General**

- .1 All valves, piping, fittings, solder and accessories shall contain no lead to be in conformance with latest edition of NSF 61 Drinking Water System Components – Health Effects.

**1.2 REFERENCES**

- .1 American National Standards Institute (ANSI)/American Society of Mechanical Engineers International (ASME)
  - .1 ANSI/ASME B16.15, Cast Bronze Threaded Fittings, Classes 125 and 250.
  - .2 ANSI/ASME B16.18, Cast Copper Alloy Solder Joint Pressure Fittings.
  - .3 ANSI/ASME B16.22, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
- .2 ASTM International Inc.
  - .1 ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .2 ASTM A536, Standard Specification for Ductile Iron Castings.
  - .3 ASTM B88M, Standard Specification for Seamless Copper Water Tube (Metric).
- .3 American National Standards Institute/American Water Works Association (ANSI)/(AWWA)
  - .1 ANSI/AWWA C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
- .4 Canada Green Building Council (CaGBC)
  - .1 LEED Canada 2009 for Design and Construction, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.
- .5 Canadian Standards Association (CSA International)
  - .1 CSA B242, Groove and Shoulder Type Mechanical Pipe Couplings.
- .6 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act, 1999, c. 33 (CEPA).
- .7 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .8 Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS)
  - .1 MSS-SP-67, Butterfly Valves.
  - .2 MSS-SP-80, Bronze Gate, Globe, Angle and Check Valves.
- .9 National Research Council (NRC)/Institute for Research in Construction
  - .1 NRCC 38728, National Plumbing Code of Canada (NPC).
- .10 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act, 1992, c. 34 (TDGA).

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Provide manufacturer's printed product literature and datasheets for insulation and adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Sustainable Design Submittals:
  - .1 Submittals: in accordance with Section 01 47 15 - LEED Sustainable Requirements.
- .4 Closeout Submittals:
  - .1 Provide maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Store and manage hazardous materials in accordance with Section 1 47 15 - Sustainable Requirements: Construction.
- .1 Waste Management: In accordance with 01 74 21 Construction Waste Management.

### **1.5 SUSTAINABLE REQUIREMENTS**

- .1 Construction:
  - .1 Construction requirements detailed in Section 01 47 15 - Sustainable Requirements: Construction form integral part of this project including materials and products of this Section. Sustainable construction requirements include:
    - .1 Specific construction requirements for project.
    - .2 Specification text to ensure that project will comply with green design process and sustainability requirements.
    - .3 Administrative, temporary and procedural requirements for the use of materials and methods of construction.

## **Part 2 Products**

### **2.1 SUSTAINABLE REQUIREMENTS**

- .1 Materials and products in accordance with Section 01 47 15 - Sustainable Requirements: Construction.

### **2.2 PIPING**

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

### **2.3 FITTINGS**

- .1 Bronze pipe flanges and flanged fittings, Class 150: to ANSI/ASME B16.24.

- .2 Cast bronze threaded fittings, Class 125: to ANSI/ASME B16.15.
- .3 Cast copper, solder type: to ANSI/ASME B16.18.
- .4 Wrought copper and copper alloy, solder type: to ANSI/ASME B16.22.
- .5 NPS 2 and larger: ANSI/ASME B16.18 or ANSI/ASME B16.22 roll grooved to CSA B242.
- .6 NPS 1 and smaller: wrought copper to ANSI/ASME B16.22;. Suitable for operating pressure to 1380 kPa.

## **2.4 JOINTS**

- .1 Rubber gaskets, latex-free 1.6 mm thick: to AWWA C111.
- .2 Bolts, nuts, hex head and washers: to ASTM A307, heavy series.
- .3 Solder: 95/5 tin copper alloy.
- .4 Teflon tape: for threaded joints.
- .5 Grooved couplings: designed with angle bolt pads to provide rigid joint, complete with EPDM gasket.
- .6 Dielectric connections between dissimilar metals: dielectric fitting, complete with thermoplastic liner.

## **2.5 SWING CHECK VALVES**

- .1 NPS 2 and under, threaded:
  - .1 To MSS-SP-80, Class 125, 860 kPa, bronze body, bronze swing disc, screw in cap, regrindable seat.
- .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.
- .3 NPS 2 and under, screwed:
  - .1 Class 150.
  - .2 Bronze body, chrome plated brass ball, PTFE adjustable packing, brass gland and PTFE seat, steel lever handle.
- .4 NPS 2 and under, soldered:
  - .1 To ANSI/ASME B16.18, Class 150.
  - .2 Bronze body, chrome plated brass ball, PTFE adjustable packing, brass gland and PTFE seat, steel lever handle, with NPT to copper adaptors



**Part 3 Execution**

**3.1 APPLICATION**

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

**3.2 INSTALLATION**

- .1 Install in accordance with Manitoba Plumbing Code.
- .2 Install pipe work in accordance with Section 23 05 05 - Installation of Pipework, supplemented as specified herein.
- .3 Assemble piping using fittings manufactured to ANSI standards.
- .4 Install CWS piping below and away from HWS and HWC and other hot piping so as to maintain temperature of cold water as low as possible.
- .5 Connect to fixtures and equipment in accordance with manufacturer's written instructions unless otherwise indicated.
- .6 Buried tubing:
  - .1 Lay in well compacted washed sand in accordance with AWWA Class B bedding.
  - .2 Bend tubing without crimping or constriction. Minimize use of fittings.

**3.3 VALVES**

- .1 Isolate equipment, fixtures and branches with ball valves.
- .2 Balance recirculation system using lockshield globe valves. Mark settings and record on as-built drawings on completion.

**3.4 PRESSURE TESTS**

- .1 Conform to requirements of Section 21 05 01 - Common Work Results for Mechanical.
- .2 Test pressure: greater of 1 times maximum system operating pressure or 860 kPa.

**3.5 FLUSHING AND CLEANING**

- .1 Flush entire system for 8 h. Ensure outlets flushed for 2 hours. Let stand for 24 hours, and then draw one sample off longest run. Submit to testing laboratory to verify that system is clean. Let system flush for additional 2 hours, then draw off another sample for testing.

**3.6 PRE-START-UP INSPECTIONS**

- .1 Systems to be complete, prior to flushing, testing and start-up.
- .2 Verify that system can be completely drained.
- .3 Ensure that pressure booster systems are operating properly.
- .4 Ensure that air chambers, expansion compensators are installed properly.

### **3.7 DISINFECTION**

- .1 Flush out, disinfect and rinse system to requirements of authority having jurisdiction.
- .2 Upon completion, provide laboratory test reports on water quality for approval.

### **3.8 START-UP**

- .1 Timing: start up after:
  - .1 Pressure tests have been completed.
  - .2 Disinfection procedures have been completed.
  - .3 Certificate of static completion has been issued.
  - .4 Water treatment systems operational.
- .2 Provide continuous supervision during start-up.
- .3 Start-up procedures:
  - .1 Establish circulation and ensure that air is eliminated.
  - .2 Check pressurization to ensure proper operation and to prevent water hammer, flashing and/or cavitation.
  - .3 Monitor piping HWS and HWC piping systems for freedom of movement, pipe expansion as designed.
  - .4 Check control, limit, safety devices for normal and safe operation.
- .4 Rectify start-up deficiencies.

### **3.9 PERFORMANCE VERIFICATION**

- .1 Scheduling:
  - .1 Verify system performance after pressure and leakage tests and disinfection are completed, and Certificate of Completion has been issued by authority having jurisdiction.
- .2 Procedures:
  - .1 Verify that flow rate and pressure meet Design Criteria.
  - .2 TAB HWC in accordance with Section 23 05 93 - Testing, Adjusting and Balancing for HVAC.
  - .3 Adjust pressure regulating valves while withdrawal is maximum and inlet pressure is minimum.
  - .4 Sterilize HWS and HWC systems for Legionella control.
  - .5 Verify performance of temperature controls.
  - .6 Verify compliance with safety and health requirements.
  - .7 Check for proper operation of water hammer arrestors. Run one outlet for 10 seconds, then shut of water immediately. If water hammer occurs, replace water hammer arrestor or re-charge air chambers. Repeat for outlets and flush valves.
  - .8 Confirm water quality consistent with supply standards, and ensure no residuals remain as result of flushing or cleaning.

- .3 Reports:
  - .1 In accordance with Section 01 91 13 - General Commissioning (Cx)  
Requirements: Reports, using report forms as specified in Section 01 91 13 -  
General Commissioning (Cx) Requirements: Report Forms and Schematics.
  - .2 Include certificate of water flow and pressure tests conducted on incoming water  
service, demonstrating adequacy of flow and pressure.

### **3.10 OPERATION REQUIREMENTS**

- .1 Co-ordinate operation and maintenance requirements including, cleaning and  
maintenance of specified materials and products with Section 23 05 05 - Installation of  
Pipework.
- .2 Operational requirements in accordance with Section 01 47 19 - Sustainable  
Requirements: Operation, include:
  - .1 Cleaning materials and schedules.
  - .2 Repair and maintenance materials and instructions.

### **3.11 CLEANING**

- .1 Clean in accordance with Section 01 74 00 - Cleaning.
- .2 Waste Management: In accordance with 01 74 21 Construction Waste Management.

**END OF SECTION**

**Part 1 General**

**1.1 REFERENCES**

- .1 ASTM International Inc.
  - .1 ASTM D2564, Standard Specification for Solvent Cements for Poly(Vinyl-Chloride) (PVC) Plastic Piping Systems.
- .2 Canada Green Building Council (CaGBC)
  - .1 LEED Canada 2009 for Design and Construction, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.
- .3 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-Series B1800, Thermoplastic Nonpressure Pipe Compendium - B1800 Series.
- .4 Green Seal Environmental Standards (GSES)
  - .1 Standard GS-36, Commercial Adhesives.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .6 South Coast Air Quality Management District (SCAQMD), California State
  - .1 SCAQMD Rule 1168, Adhesive and Sealant Applications.

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Provide manufacturer's printed product literature and datasheets for piping and adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Provide two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 30 - Health and Safety and Section 01 35 43 - Environmental Procedures.
- .1 Sustainable Design Submittals:
  - .1 Submittals: in accordance with Section 01 47 15 - LEED Sustainable Requirements.

**1.3 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle in accordance with Section 01 60 00 - Common Product Requirements.
- .2 Deliver materials to Site in original factory packaging, labelled with manufacturer's name, address.
- .3 Store at temperatures and conditions recommended by manufacturer.
- .4 Waste Management: In accordance with 01 74 21 Construction Waste Management.

**Part 2 Products**

**2.1 MATERIAL**

- .1 Sustainable Requirements: materials and products in accordance with Section 01 47 15 Sustainable Requirements: Construction.
- .2 Adhesives and Sealants:
  - .1 Maximum VOC limit in accordance with Section 01 47 15 - LEED Sustainable Requirements.

**2.2 PIPING AND FITTINGS**

- .1 For buried and above ground DWV piping to:
  - .1 CAN/CSA B1800.

**2.3 JOINTS**

- .1 Solvent weld for PVC: to ASTM D2564.

**Part 3 Execution**

**3.1 APPLICATION**

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

**3.2 INSTALLATION**

- .1 In accordance with Section 23 05 05 - Installation of Pipework.
- .2 Install in accordance with Manitoba Plumbing Code.
- .3 **All roof penetrations for plumbing venting shall use Thaler cones. Spun aluminum is not acceptable.**

**3.3 TESTING**

- .1 Pressure test buried systems before backfilling.
- .2 Hydraulically test to verify grades and freedom from obstructions.

**3.4 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 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 fixtures are properly anchored, connected to system and effectively vented.
- .5 Affix applicable label (storm, sanitary, vent, pump discharge) c/w directional arrows every floor or 4.5 m (whichever is less).

### **3.5 CLEANING**

- .1 Clean in accordance with Section 01 74 00 - Cleaning.
  - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: In accordance with 01 74 21 Construction Waste Management.

**END OF SECTION**

**Part 1 General**

**1.1 REFERENCES**

- .1 ASTM International
  - .1 ASTM B62, Standard Specification for Composition Bronze or Ounce Metal Castings.
- .2 Canada Green Building Council (CaGBC)
  - .1 LEED Canada 2009 for Design and Construction, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.
- .3 CSA International
  - .1 CSA-B64 Series, Backflow Preventers and Vacuum Breakers.
  - .2 CSA B79, Commercial and Residential Drains and Cleanouts.
- .4 Efficiency Valuation Organization (EVO)
  - .1 International Performance Measurement and Verification Protocol (IPMVP).
    - .1 IPMVP Version.
- .5 Plumbing and Drainage Institute (PDI)
  - .1 PDI-WH201, Water Hammer Arresters Standard.

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for plumbing products and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 - Health and Safety and Section 01 35 43 - Environmental Procedures. Indicate VOC's:
- .3 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .4 Instructions: submit manufacturer's installation instructions.
- .5 Manufacturers' Field Reports: manufacturers' field reports specified.
- .6 Sustainable Design Submittals:
  - .1 Submittals: in accordance with Section 01 47 15 - LEED Sustainable Requirements.

**1.3 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

- .2 Operation and Maintenance Data: submit operation and maintenance data for plumbing specialties and accessories for incorporation into manual.
  - .1 Description of plumbing specialties and accessories, giving manufacturers name, type, model, year and capacity.
  - .2 Details of operation, servicing and maintenance.
  - .3 Recommended spare parts list.

#### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 60 00 - Common Product Requirements] [with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to Site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect plumbing materials from damage.
  - .3 Replace defective or damaged materials with new.
- .4 Waste Management: In accordance with 01 74 21 Construction Waste Management.

### **Part 2 Products**

#### **2.1 ROOF DRAINS**

- .1 Roof Drain: 381 mm diameter roof drain, dura-coated cast iron body with combination membrane flashing clamp/gravel guard and low silhouette Poly-Dome, 102 mm pipe size connection.
- .2 Acceptable Product: Zurn model Z100.  
Acceptable Equals: "Jay R Smith"

#### **2.2 CLEANOUTS**

- .1 Cleanout Plugs: heavy cast iron male ferrule with brass screws and threaded brass or bronze plug. Sealing-caulked lead seat or neoprene gasket.
- .2 Access Covers:
  - .1 Wall Access: face or wall type, stainless steel square cover with flush head securing screws, bevelled edge frame complete with anchoring lugs.
  - .2 Floor Access: rectangular cast iron body and frame with adjustable secured nickel bronze top and:
    - .1 Plugs: bolted bronze with neoprene gasket.
    - .2 Cover for Unfinished Concrete Floors: cast iron square, 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.
- .3 Acceptable Product: "Jay R Smith"

### **2.3 WATER HAMMER ARRESTORS**

- .1 Copper construction, piston type: to PDI-WH201.
- .2 Acceptable Product: "Jay R Smith"

### **2.4 BACK FLOW PREVENTERS**

- .1 Double Check Valve (BFP-1):
  - .1 The Double Check Backflow Prevention Assembly shall be certified to NSF/ANSI 372, ASSE® Listed 1015, FM approved, and supplied with butterfly valves. The main body and access cover shall be epoxy coated ductile iron (ASTM A 536 Grade 4), the seat ring and check valve shall be NORYL™, the stem shall be stainless steel (ASTM A 276) and the seat disc elastomers shall be EPDM. The checks shall be accessible for maintenance without removing the device from the line.
  - .2 Acceptable Product: ZURN WILKINS Model 350A BG.
- .2 Reduced Pressure Zone Type (BFP-2):
  - .1 The assembly shall consist of an internal pressure differential relief valve located in a zone between two positive seating check modules with captured springs and silicone seat discs. Seats and seat discs shall be replaceable in both check modules and the relief valve. There shall be no threads or screws in the waterway exposed to line fluids. Service of all internal components shall be through a single access bronze cover secured with stainless steel bolts. The assembly shall also include two resilient seated isolation valves, four resilient seated test cocks and an air gap drain fitting. The assembly shall meet the requirements of: USC; ASSE Std. 1013; AWWA Std. C511-92; CSA B64.4.
  - .2 Acceptable Product: Watts Series 009.

### **2.5 VACUUM BREAKERS**

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

### **2.6 TRAP SEAL PRIMERS**

- .1 Brass, with integral vacuum breaker, NPS 1/2 solder ends, NPS 1/2 drip line connection.
- .2 Acceptable Product: "Jay R Smith"

### **2.7 STRAINERS**

- .1 [860] kPa, Y type with 20 mesh, monel, bronze or stainless steel removable screen.
- .2 NPS 2 and under, bronze body, screwed ends, with [brass] cap.

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

## **2.8 BUTTERFLY VALVES**

- .1 Body: cast iron epoxy coated one-piece wafer design with extended neck to allow 50mm of piping insulation, flange hole drilling, non-corrosive bushing and self-adjusting stem seal, flange locating holes shall be provided on wafer bodies, rated for bubble-tight shut-off for bidirectional service to 1207 kPa (175PSI), tested for tight shut-off to 110% of rated pressure,
- .2 Disc: nylon coated ductile iron disc, edge and hub on metal discs spherically machined and hand polished for minimum torque and maximum sealing capability, disc-to-stem connection is internal double "D" design with no possible leak paths in the disc-to-stem connection.
- .3 Stem: 316 stainless steel one-piece stem design and mechanically retained in the body neck and no part of the stem shall be exposed to the line media.
- .4 Seat: EPDM valve seat, tongue and groove design with a primary hub seal and a molded flange O-ring suitable for weld-neck and slip-on flanges, totally encapsulate the body isolating the body from the line media and no flange gaskets shall be required.
- .5 Valve shall be 75 mm with a manual lever handle and notch plate actuation.
- .6 Acceptable Product: "Bray" series 30.

## **2.9 TEMPERED WATER MIXING VALVE**

- .1 The tempered water mixing valve shall be a single-valve Hi/Lo type with paraffin-based, thermal actuation technology for precise temperature control. Valve shall be listed to ASSE 1017 and CSA B125 and have an approach temperature of 5°F (3°C). Valve shall have an outlet temperature range from 32-71°C (90-160°F) with a lockable temperature-setting feature. Valve shall be constructed using Lead Free brass material which shall comply with local codes and standards, where applicable, requiring reduced lead content and feature a single-seat design for positive shutoff. Valves shall come standard with union check stops. Minimum flows to ASSE 1017 shall be 4 L/min (1.0 GPM).
- .2 Acceptable Product: "Powers" Model LFSH1434-13 or approved equal in accordance with B7.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for plumbing specialties and accessories installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Contract Administrator
  - .2 Inform Contract Administrator of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Contract Administrator.

**3.2 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

**3.3 INSTALLATION**

- .1 Install in accordance with Manitoba Plumbing Code.
- .2 Install in accordance with manufacturer's instructions and as specified.

**3.4 CLEANOUTS**

- .1 Install cleanouts at base of soil and waste stacks, and rainwater leaders, at locations required code, and as indicated.
- .2 Bring cleanouts to wall or finished floor unless serviceable from below floor.
- .3 Building drain cleanout and stack base cleanouts: line size to maximum NPS 4.

**3.5 WATER HAMMER ARRESTORS**

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

**3.6 BACK FLOW PREVENTERS**

- .1 Install in accordance with CSA-B64 Series, where indicated and elsewhere as required by code.
  - .1 Drains.
- .2 Pipe discharge to terminate over nearest drain.

**3.7 TRAP SEAL PRIMERS**

- .1 Install for floor drains and elsewhere, as indicated.
- .2 Install on cold water supply to nearest frequently used plumbing fixture, in concealed space, to approval of Contract Administrator.
- .3 Install plastic tubing to floor drain.

**3.8 STRAINERS**

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

**3.9 START-UP**

- .1 General:
  - .1 In accordance with Section 01 91 13 - General Commissioning (Cx)  
Requirements: General Requirements, supplemented as specified herein.
- .2 Timing: start-up only after:
  - .1 Pressure tests have been completed.
  - .2 Disinfection procedures have been completed.
  - .3 Certificate of static completion has been issued.

- .4 Water treatment systems operational.
- .3 Provide continuous supervision during start-up.

**3.10 TESTING AND ADJUSTING**

- .1 General:
  - .1 Test and adjust plumbing specialties and accessories in accordance with Section 01 91 13- General Commissioning (Cx) Requirements : General Requirements, supplemented as specified.

- .2 Timing:
  - .1 After start-up deficiencies rectified.
  - .2 After certificate of completion has been issued by authority having jurisdiction.
- .3 Floor drains:
  - .1 Verify operation of trap seal primer.
  - .2 Prime, using trap primer. Adjust flow rate to suit Site conditions.
  - .3 Check operations of flushing features.
  - .4 Check security, accessibility, removability of strainer.
  - .5 Clean out baskets.
- .4 Vacuum breakers, backflow preventers, backwater valves:
  - .1 Test tightness, accessibility for O M of cover and of valve.
  - .2 Simulate reverse flow and back-pressure conditions to test operation of vacuum breakers, backflow preventers.
  - .3 Verify visibility of discharge from open ports.
- .5 Roof drains:
  - .1 Check location at low points in roof.
  - .2 Check security, removability of dome.
  - .3 Adjust weirs to suit actual roof slopes, meet requirements of design.
  - .4 Clean out sumps.
  - .5 Verify provisions for movement of roof systems.
- .6 Access doors:
  - .1 Verify size and location relative to items to be accessed.
- .7 Cleanouts:
  - .1 Verify covers are gas-tight, secure, yet readily removable.
- .8 Water hammer arrestors:
  - .1 Verify proper installation of correct type of water hammer arrester.
- .9 Strainers:
  - .1 Clean out repeatedly until clear.
  - .2 Verify accessibility of cleanout plug and basket.
  - .3 Verify that cleanout plug does not leak.

### **3.11 CLOSEOUT ACTIVITIES**

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

**3.12 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .3 Waste Management: In accordance with 01 74 21 Construction Waste Management.

**3.13 PROTECTION**

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

**END OF SECTION**

**Part 1 General**

**1.1 REFERENCES**

- .1 Air-Conditioning and Refrigeration Institute (ARI)
  - .1 ARI 1010, Self-Contained, Mechanically Refrigerated Drinking-Water Coolers.
- .2 Canada Green Building Council (CaGBC)
  - .1 LEED Canada 2009 for Design and Construction, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.
- .3 CSA Group
  - .1 CAN/CSA-B45 Series, Plumbing Fixtures.
  - .2 CSA B125.3, Plumbing Fittings.
  - .3 CSA B651, Accessible Design for the Built Environment.
- .4 Green Seal (GS)
  - .1 GS-36, Adhesives for Commercial Use.
- .5 South Coast Air Quality Management District (SCAQMD)
  - .1 SCAQMD Rule 1168, Adhesive and Sealant Applications.

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for plumbing fixtures and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Indicate fixtures and trim:
    - .1 Dimensions, construction details, roughing-in dimensions.
    - .2 Factory-set water consumption per flush at recommended pressure.
    - .3 (For water closets, urinals): minimum pressure required for flushing.
- .3 Sustainable Design Submittals:
  - .1 Submittals: in accordance with Section 01 47 15 - LEED Sustainable Requirements.

**1.3 CLOSEOUT SUBMITTALS**

- .1 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.

#### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 60 00 - Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to Site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect materials from damage.
  - .3 Replace defective or damaged materials with new.
- .4 Waste Management: In accordance with 01 74 21 Construction Waste Management.

#### **Part 2 Products**

##### **2.1 PLUMBING FIXTURES**

- .1 Adhesives and sealants: Maximum VOC limit in accordance with Section 01 47 15 - LEED Sustainable Requirements.
- .2 Fixture piping:
  - .1 Hot and cold water supplies to fixtures:
    - .1 Chrome plated rigid supply pipes with hand wheel stop, reducers, escutcheon.
    - .2 Waste:
      - .1 Brass P trap with clean out on fixtures not having integral trap.
      - .2 Chrome plated in exposed places.
  - .3 Chair carriers:
    - .1 Factory manufactured floor-mounted carrier systems for wall-mounted fixtures.

##### **2.2 P-1: Water Closet**

- .1 Water Closet: Floor mounted elongated flushometer toilet with seat, vitreous china, high efficiency 4.2 Lpf to 6.0 Lpf, 381 mm rim height, elongated open front, fully glazed 54mm trapway, 305mm rough in, 38 mm inlet spud and two bolt caps.
- .2 Flush Valve: Electronic proximity infrared sensor activated toilet flush valve shall feature self-cleaning piston valve with integral wiper spring in refill orifice to help prevent clogging. Includes a UL listed hard-wired AC power supply. Also includes a fully mechanical manual override that will flush without power. Includes cast brass valve body and metal cover with chrome finish. High back pressure vacuum breaker and angle stop with vandal-resistant cap and back-flow protection included. 4.2 Lpf..
- .3 Acceptable Product: "American Standard" model 2234.001 water closet and "American Standard" model 6067.111.002 flush valve.  
Acceptable Equals (Water Closet): Contrac, Kohler, Gerber.



### 2.3 **P-2: Barrier Free Water Closet**

- .1 Water Closet: Floor mounted elongated flushometer toilet with seat, vitreous china, high efficiency 4.2 Lpf to 6.0 Lpf, 419 mm rim height, elongated open front, fully glazed 54mm trapway, 305mm rough in, 38 mm inlet spud and two bolt caps.
- .2 Flush Valve: ADA compliant, electronic proximity infrared sensor activated toilet flush valve shall feature self-cleaning piston valve with integral wiper spring in refill orifice to help prevent clogging. Includes a UL listed hard-wired AC power supply. Also includes a fully mechanical manual override that will flush without power. Includes cast brass valve body and metal cover with chrome finish. High back pressure vacuum breaker and angle stop with vandal-resistant cap and back-flow protection included. 4.2 Lpf.
- .3 Acceptable Product: “American Standard” model 3043.001 water closet and “American Standard” model 6067.111.002 flush valve.  
Acceptable Equals (Water Closet): Kohler, Gerber.

### 2.4 **P-3 Lavatory**

- .1 Lavatory: white, vitreous china, 44 mm waste outlet, 591 L x 413 W x overall dimensions, under counter installation, supplied with overflow.
- .2 Faucet: ADA Compliant, Sensor Activated, 24 VAC, Chrome Plated Brass, Hand Washing Faucet, splash-proof Circuit Control Module, sensor range adjustment screw, troubleshooting LED indicator lights, variable Time Out Settings, filtered Solenoid Valve with serviceable Strainer Filter, 102 mm trim Plate with Anti-Rotation Pin, 120 VAC/24 VAC Transformer, Vandal Resistant Spray Head with Pressure Compensating Flow Control, Metal Jacketed Wire Protection for Sensor and Solenoid Leads, Modular Quick-Release Sensor and Solenoid Connections. Provide below deck thermostatic mixing valve for each faucet. Provide single transformer mounted below counter to serve all faucets on one countertop.
- .3 Acceptable Product: “Kohler” Ladena model K-2215 sink and “Sloan” model ETF-80-4-B-BDT faucet.  
Acceptable Equals (Lavatory): Contrac, Gerber.  
Acceptable Equals (Faucet): Kohler.

### 2.5 **P-4: Barrier Free Lavatory**

- .1 Lavatory: White, vitreous china, wall mount, 44 mm waste outlet, 557 L x 502 W overall dimensions, supplied with overflow and hanger.
- .2 Faucet: ADA Compliant, Sensor Activated, 24 VAC, Chrome Plated Brass, Hand Washing Faucet, splash-proof Circuit Control Module, sensor range adjustment screw, troubleshooting LED indicator lights, variable Time Out Settings, filtered Solenoid Valve with serviceable Strainer Filter, 102 mm trim Plate with Anti-Rotation Pin, 120 VAC/24 VAC Transformer, Vandal Resistant Spray Head with Pressure Compensating Flow Control, Metal Jacketed Wire Protection for Sensor and Solenoid Leads, Modular Quick-Release Sensor and Solenoid Connections. Provide below deck thermostatic mixing valve for each faucet. Provide single transformer mounted below counter to serve all faucets on one countertop.
- .3 Acceptable Product: “Kohler” Model K-1999-4 sink and “Sloan” model ETF-80-4-B-BDT faucet.

Acceptable Equals (Lavatory): Contrac, Gerber.

Acceptable Equals (Faucet): Kohler.

## 2.6 P-5: Urinal

- .1 Urinal: Vitreous china, ultra-High Efficiency 0.5 Lpf (0.125gpf) , flushing rim, elongated 356 mm rim from finished wall, Washout flush action, extended sides for privacy, 19 mm inlet spud, outlet connection threaded 51 mm inside (NPTF), two wall hangers, strainer included. Meets ASME flush requirements at 0.125 to 1.0 gpf.
- .2 Flush Valve: Quiet action, hard wire operated diaphragm flush valve, right or left-hand supply installation, vandal resistant copper tube conduit, chloramine resistant diaphragm, forged brass diaphragm retainer, renewable seat, polished chrome plated finish, vacuum breaker, for urinals with 19 mm top inlet, automatic operation hard wire powered infrared sensor, polished chrome plated vandal resistant metal cover with top mounted sensor operated H2Optics® electronics, scratch resistant replaceable lens window, hard wire adaptor 24 VAC to 6 VDC converter, include optional 24 hour automatic flush factory, electronic operated non-hold-open metal manual override button with 5 second lockout, 25 mm FIP or 19mm Copper sweat inlet adaptor, angle check stop with protecting cap, adjustable 121mm plus or minus 11mm inlet/valve outlet centers, cover tube, stainless steel wall flange, spud flange, concealed spud nut, and 330mm outlet tube, field adjustable to 0.47Lpf. Contractor shall provide 110 to 24 VAC transformer.
- .3 Acceptable Product: “American Standard” model 6590.001 urinal and “Delta” model 81T231HWA flush valve.

Acceptable Equals (Urinal): Kohler, Gerber.

## 2.7 P-6: Shower

- .1 Shower Head: Rain showerhead, spray nozzles prohibit mineral buildup for easy cleaning, air induction ball Joint, Optimized spray face for maximum performance, solid brass construction, 9.5 L per minute flow rate 14 mm NPT connection.
- .2 Shower Valve: Thermostatic, pressure balanced mixing valve, forged brass body, can be tested with air (200 PSI) or water (300 PSI) without valve using supplied test cap, square plasterguard allows for right angle cuts, thin wall mounting, 13 mm outlets and connections.
- .3 Shower Trim: Pressure balanced single handle mixing valve trim, Lever handle, Temperature only controlled with handle, field adjustable to limit handle rotation into hot water zone, 120° maximum handle rotation, All parts replaceable from the front of the valve.
- .4 Acceptable Product: “Kohler” model K-13695 shower head, “Delta” series R10000 series shower valve and “Delta” model T14086 shower trim.

Acceptable Equals (Shower Head): Delta

Acceptable Equals (Shower Head Valve & Trim): Kohler

## 2.8 P-6a: Shower (Tempered Water)

- .1 Shower Head: Bronze body with hard chrome plated finish, maximum flow rate 4.7 L/min (1.25 GPM) at 552kPa (80 PSI), with variable flow orifice feature to maintain

constant flow rate, fixed stream head, 13 mm NPT female threaded inlet, 4 mounting screws provided, vandal resistant standard, 30 degree shower head angle as standard

- .2 Automatic shower controls shall be supplied by Zone All Controls (Contact: Kevin Dyer). Controls package shall include:
  - .1 Tempered Shower Valve: Two position solenoid, electrically actuated, suitable for use with potable water systems.
  - .2 Shower Control Panel: Provide all wiring and control boards mounted in a wall mounted electrical enclosure.
  - .3 Electrical transformers: 110V to 24VAC. Provide two transformers for shower control panels and one transformer for shower valve power supply.
  - .4 Contractor to provide all wiring between transformers, control panels and tempered water shower valves.
- .3 Acceptable Product: "Zurn" model Z7000-i2-1.25 shower head.

**2.9 P-7: Barrier Free Shower:**

- .1 Shower system shall feature a wall supply with 13mm NPT female inlets and 13 mm NPSM male outlet, 1499 mm metal hose, vacuum breaker, 5.7 L/min 3 function hand shower with pause feature, 914 mm slide-grab bar. Pressure balance valve shall feature a cast brass body. Shall feature ceramic disc valve cartridge which controls water temperature and volume. Shall also feature hot limit safety stop.
- .2 Acceptable Product: "American Standard" model 1662SG.211.002 shower system kit.  
Acceptable Equals: Delta, Kohler

**2.10 P-8: Linear Floor Drain**

- .1 150 mm wide, 73mm deep, 1000 mm long, non-sloped trench drain system, body is manufactured from polypropylene. Each body has tabs on both sides of the body, for rebar tie down and leveling. Bodies have interlocking ends and a radiused bottom, 76 mm no hub bottom outlet connection, 508 mm long polypropylene grate.
- .2 Acceptable Product: "Mifab" model T300.

**2.11 P-9: Floor Drain**

- .1 Dura-Coated cast iron body with bottom outlet, combination invertible membrane clamp and adjustable collar with seepage slots, "Type S" polished nickel bronze, square heel – proof, light duty strainer. Provide trap seal primer and vandal proof secured top.
- .2 Acceptable Product: "Zurn" model Z415S-P-VP.  
Acceptable Equals: Jay R Smith

**2.12 P-10: Drinking Fountain (Splash Pad)**

- .1 Constructed of a premium composite, solid surface material. White granite finish.
- .2 Contoured basin minimizes splashing and has exclusive Flexi-Guard® safety bubbler to help prevent accidental mouth injuries.
- .3 Easy to operate, fully functional chrome plated pushbutton is vandal-resistant.
- .4 Bottom cover plate included.

- .5 Flow regulator provides constant stream from 20 to 105 psi water pressure.
- .6 Both fountains shall be installed in accordance with ADA standards.
- .7 Fountains are manufactured with a waterway system utilizing copper components and completely lead-free material.
- .8 Acceptable Product: "Elkay" model EDFP214RC.

**2.13 P-10a: Drinking Fountain (Lobby)**

- .1 Construction:
  - .1 Stainless Steel basin with integral drain
  - .2 Galvanized structural steel cooler chassis provides structural integrity
  - .3 Stainless steel bottle filler wrapper with ABS plastic alcove
  - .4 Stainless steel cooler cabinet.
  - .5 Vandal-resistant one-piece heavy-duty bubbler
- .2 Standard Features:
  - .1 Sanitary, touchless activation with auto 20-second shut-off (Bottle Filler)
  - .2 Easy-touch front and side push bar controls (Cooler)
  - .3 3000-gallon capacity Filtration System, certified to NSF/ANSI 42 & 53 (Lead, Class 1 Particulate, Chlorine, Taste & Odor)
  - .4 Integrated Silver Ion Anti-microbial Protection in key areas
  - .5 Quick Fill Rate: 4.2 L/min (1.1 gpm)
  - .6 Laminar Flow provides minimal splash
  - .7 Real Drain System eliminates standing water
  - .8 Visual User Interface display includes:
    - .1 Innovative Green Ticker™ counts bottles saved from waste
    - .2 LED Visual Filter Monitor shows when replacement is necessary
  - .9 Includes Vandal-resistant bubbler
  - .10 Cooler panel finishes: Stainless Steel
- .3 Cooling System:
  - .1 Compressor: hermetically-sealed, reciprocating type, single phase. Sealed-in lifetime lubrication.
  - .2 Condenser: Fan cooled, copper tube with aluminum fins. Fan motor is permanently lubricated.
  - .3 Cooling Unit: Combination tube-tank type. Self-cleansing. Continuous copper tubing with stainless steel tank. Fully insulated with EPS foam which meets UL requirements for self-extinguishing material.
  - .4 Refrigerant Control: Refrigerant R134a is controlled by accurately calibrated capillary tube.
  - .5 Temperature Control: Easily accessible enclosed adjustable thermostat is factory preset. Requires no adjustment other than for altitude requirements.
- .4 Acceptable Product: "Elkay" model LZS8WSVRSK.

**2.14 P-11: Wall Hydrant**

- .1 Encased anti-siphon wall hydrant complete with backflow preventer, all bronze interior parts, ½ turn ceramic disc cartridge 19 mm female solder inlet and 19 mm male pipe thread connection, and 19 mm male hose connection. Stainless steel box and hinged cover with operating key lock and “water” stamped on cover.
- .2 Include polished nickel bronze face.
- .3 Acceptable product: “Zurn” model Z1330-NB.  
Acceptable Equals: Woodford, Jay R Smith

**2.15 P-12: Counter Mounted Sink (MPR)**

- .1 Sink: ADA compliant, single compartment sink with faucet ledge, 18 gauge, type 304, 18-10 stainless steel. Self-rimming. Exposed surfaces are satin finished. Undercoated to reduce condensation and resonance. Includes factory applied rim seal, cutout template, Universal Installation System hardware and 3 1/2" (89mm) crumb cup waste assembly, location center. Compartment size of 36cm x 41cm x 20cm. Overall size of 48cm x 46cm.
- .2 Faucet: Heavy duty cast brass, 8” centerset, two handles, polished chrome plated finish, metal hold-down package and ceramic valve cartridges, 8” tubular swing spout and 3” lever blade ADA compliant handles with vandal resistant screws. Provide a 1 gpm aerator.
- .3 Acceptable Product: “Kindred” model LBS4608P-1 sink and “Delta” model 26C3243 faucet.

**2.16 P-13: Non-Freeze Wall Hydrant**

- .1 Concealed non-freeze key operated wall hydrant with nickel bronze box and door, chrome plated hydrant face, integral vacuum breaker, 19 mm hose connection, 19 mm female x 25 mm male pipe connection, all bronze head, seat casting and internal working parts, bronze wall casing, and loose key. Complies with ASSE 1019-2004, UPC/IAMPO Listed. Maximum operating pressure of 862kPa (125 psi).
- .2 Acceptable Product: “Watts” model HY-725.  
Acceptable Equals: Woodford, Jay R Smith

**2.17 P-14: Janitor Mop Sink**

- .1 Sink: Molded-Stone janitor mop sink with molding done in matched metal dies under heat and pressure, 254mm high and 25mm wide walls, factory installed stainless steel drain body, caulk connection or QDC-3 joint to 76mm drain, combination stainless steel dome strainer and lint basket,
- .2 Faucet: Chrome plated with vacuum breaker, commercial red brass alloy casting-rough finish, integral stops, adjustable wall brace, pail hook and 19mm hose thread on spout, body inlets 203mm center to center, four arm handles, valves with renewable hub, renewable seats, wivel discs, encased washers and brass washer screws, cold (blue) and hot (red) colour indicators.
- .3 Acceptable Product: “Fiat Products” model MSB 2424 mop sink and “Fiat Products” model 830-AA faucet.

Acceptable Equals (Mop Sink Faucet): Delta, Kohler.

**2.18 P-15: Pool Gutter Drain**

- .1 Bronze, flush style gutter drain, 75mm diameter FPT, cast bronze drain fitting, 100 x 300 grate size.
- .2 Acceptable Product: "Standard Bronze Company" model 5234.

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for washroom fixtures installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Contract Administrator.
  - .2 Inform Contract Administrator of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from the Contract Administrator.

**3.2 INSTALLATION**

- .1 Mounting heights:
  - .1 Standard: to manufacturer's recommendations, measured from finished floor.
  - .2 Wall-hung fixtures: measured from finished floor.
  - .3 Barrier-free: to most stringent requirements.
- .2 Drinking fountains:
  - .1 In accordance with ARI 1010.

**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 Adjust flush valves to suit actual Site conditions.
  - .4 Adjust urinal flush timing mechanisms.
  - .5 Set controls of automatic flush valves for WCs and urinals to prevent unnecessary flush cycles.
- .3 Checks:
  - .1 Water closets, urinals: flushing action.
  - .2 Aerators: operation, cleanliness.
  - .3 Vacuum breakers, backflow preventers: operation under all conditions.
- .4 Thermostatic controls:

- .1 Verify temperature settings, operation of control, limit and safety controls.

### **3.4 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .3 Waste Management: In accordance with 01 74 21 Construction Waste Management.

**END OF SECTION**