

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 22 11 16 – Domestic Water Piping.
- .2        Section 22 13 17 – Drainage Waste and Vent Piping – Cast Iron and Copper.
- .3        Section 22 42 01 – Plumbing Specialties and Accessories.
- .4        Section 22 42 03 – Commercial Plumbing Fixtures.

**1.2                ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2        Shop drawings; submit drawings stamped and signed by professional engineer registered or licensed in Province of Nova Scotia, Canada.
- .3        Shop drawings to show:
  - .1        Mounting arrangements.
  - .2        Operating and maintenance clearances.
- .4        Shop drawings and product data accompanied by:
  - .1        Detailed drawings of bases, supports, and anchor bolts.
  - .2        Acoustical sound power data, where applicable.
  - .3        Points of operation on performance curves.
  - .4        Manufacturer to certify current model production.
  - .5        Certification of compliance to applicable codes.
- .5        In addition to transmittal letter referred to in Section 01 33 00 - Submittal Procedures: use MCAC "Shop Drawing Submittal Title Sheet". Identify section and paragraph number.
- .6        Closeout Submittals:
  - .1        Provide operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
  - .2        Operation and maintenance manual approved by, and final copies deposited with, PWGSC Representative before final inspection.
  - .3        Operation data to include:
    - .1        Control schematics for systems including environmental controls.
    - .2        Description of systems and their controls.
    - .3        Description of operation of systems at various loads together with reset schedules and seasonal variances.
    - .4        Operation instruction for systems and component.
    - .5        Description of actions to be taken in event of equipment failure.
    - .6        Valves schedule and flow diagram.
    - .7        Colour coding chart.
  - .4        Maintenance data to include:

- .1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.
- .2 Data to include schedules of tasks, frequency, tools required and task time.
- .5 Performance data to include:
  - .1 Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.
  - .2 Equipment performance verification test results.
  - .3 Special performance data as specified.
- .6 Approvals:
  - .1 Submit 2 copies of draft Operation and Maintenance Manual to PWGSC Representative for approval. Submission of individual data will not be accepted unless directed by PWGSC Representative.
  - .2 Make changes as required and re-submit as directed by PWGSC Representative.
- .7 Additional data:
  - .1 Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.
- .8 Site records:
  - .1 PWGSC Representative will provide 1 set of reproducible mechanical drawings. Provide sets of white prints as required for each phase of work. Mark changes as work progresses and as changes occur. Include changes to existing mechanical systems, control systems and low voltage control wiring.
  - .2 Transfer information weekly to reproducibles, revising reproducibles to show work as actually installed.
  - .3 Use different colour waterproof ink for each service.
  - .4 Make available for reference purposes and inspection.
- .9 As-built drawings:
  - .1 Prior to start of Testing, Adjusting and Balancing for HVAC, finalize production of as-built drawings.
  - .2 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).
  - .3 Submit to PWGSC Representative for approval and make corrections as directed.
  - .4 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.
- .10 Submit copies of as-built drawings for inclusion in final TAB report.

**1.3 DRAWING NOTES**

- .1 Work of this contract shall be carried out in accordance with the requirements of the National Plumbing code, National Building Code and local authorities having jurisdiction.
- .2 Plumbing drawings shall be read in conjunction with all other tender documents including shop drawings.
- .3 This contractor shall coordinate his work in strict accordance with applicable codes, regulations, and the work of other trades. The more stringent requirement shall take precedence where there is a conflict between codes and reference standards.
- .4 Plumbing drawings are generally schematic in nature. Architectural drawings shall govern for any measurements relating to the installation of plumbing services.
- .5 This contractor shall provide and install all valves, traps, and trap priming devices, and required fittings to make equipment fully functional.
- .6 Submit shop drawings for plumbing fixtures, trim, accessories, shock arresters, floor drains, valves, cleanouts, access doors, and trap priming valves in accordance with general conditions. Acceptable products named shall meet all requirements of specified products.
- .7 Hangers for copper piping shall be copper type, clevis, and shall be provided with prefabricated insulation shields for insulated piping.
  - .1 Pipe size: up to 19mm 25mm
  - .2 Hanger spacing: 1220mm 2135mm
- .8 Insulate domestic water piping with 25mm high density fiberglass insulation c/w all service jacket. Install PVC cover in exposed areas.
- .9 Chrome plated or stainless steel escutcheons shall be installed on piping passing through finished walls, ceilings, and floors. Escutcheons shall be c/w set screws for ceiling and wall mounting.
- .10 All cutting and patching related to plumbing installation shall be the responsibility of this contractor.
- .11 All piping discharging to hub drains shall have minimum air gap required by the NPC.
- .12 Label all piping per ANSI standards.
- .13 Condensate drainage piping shall be Type 'L' copper insulated with fiberglass wrap c/w vapor barrier.
- .14 General contractor shall provide bases for floor-mounted equipment in plumbing contract.
- .15 Run piping vertically in walls. Avoid horizontal piping in walls. Where horizontal piping cannot be avoided, additional furring or pipe chase shall be installed to Departmental Representative's approval.
- .16 This contractor shall provide access for isolation valves above gypsum board ceilings.
- .17 Provide dielectric unions at all connections between dissimilar metals.

- .18 This contractor shall ensure that pipe openings are protected from dirt and debris during construction.
- .19 Install dielectric unions where pipes of dissimilar metals are joined.
- .20 Waste Piping:
  - .1 3" and under, above slab – copper DWV to ASTM B306 and B16.29 or cast iron to ANSI/ASME B16.12 w/ MJ fittings.
  - .2 2" and larger below slab – cast iron as noted above, DMV ABS to CAN/CSA-B181.1 DWV PVC to CAN/CSA B181.2.
  - .3 Copper fittings: Drainage pattern copper or cast brass with 50/50 solder joints. Copper to cast iron joints to be made with male bass adapters, taped or caulked ferrule to hub fitting.
- .21 Domestic Water Piping: Type 'L' hard temper to ASTM B42 and ASTM B88. Fittings to ANSI B16.18 or ANSI/ASME B16.22 except where compression fittings are required. Joints: 95:5 antimonial tin solder or lead free solder, to be verified in writing by this contractor.
- .22 Valves:
  - .1 2" and under, one manufacturer, bronze body, ANSI Class 150, non-shock, to MSS SP-80, screwed or soldered.
- .23 Shock Arrestors: to PD1-WH201 Standard, sizes as noted on drawings.
- .24 Trap Priming Valves: to National and local plumbing codes, as noted on drawings.
  - .1 Access: 8" x 8" hinged access door where required or noted on drawings with camlocks, 14 ga primed steel frame.
- .25 Cleanouts:
  - .1 Wall Type: hubless cleanout tee, cast iron or copper DWV body, gas/water tight plug.
  - .2 Access: 8" x 8" square panel and frame with smooth finish, flush type, VP screws.

#### **1.4 QUALITY ASSURANCE**

- .1 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

#### **Part 2 Execution**

##### **2.1 PAINTING REPAIRS AND RESTORATION**

- .1 Prime and touch up marred finished paintwork to match original.
- .2 Restore to new condition, finishes which have been damaged.

##### **2.2 CLEANING**

- .1 Clean interior and exterior of all systems including strainers. Vacuum interior of ductwork and air handling units.

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**2.3 DEMONSTRATION**

- .1 PWGSC Representative will use equipment and systems for test purposes prior to acceptance. Supply labour, material, and instruments required for testing.
- .2 Trial usage to apply to following equipment and systems:
  - .1 See Drawing No. M-1, M-2
- .3 Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular work hours, prior to acceptance.
- .4 Use operation and maintenance manual, as-built drawings, and audio visual aids as part of instruction materials.
- .5 Instruction duration time requirements as specified in appropriate sections.
- .6 PWGSC Representative will record these demonstrations on video tape for future reference.

**2.4 PROTECTION**

- .1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

**END OF SECTION**

**Part 1 General**

**1.1 SUMMARY**

.1 Section Includes:

- .1 Materials and installation for sanitary lift pump and reservoir tank.

**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 Product Data:

- .1 Submit manufacturer's printed product literature, specifications and data sheet for fixtures and equipment.

.3 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.

.4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.5 Instructions: submit manufacturer's installation instructions.

.6 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 DELIVERY, STORAGE AND HANDLING**

.1 Waste Management and Disposal:

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

- .3 Collect and separate for packaging material in appropriate on-site bins for recycling.
- .4 Divert unused materials from landfill to recycling facility as approved by Departmental Representative.
- .5 Unused sealant materials must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .6 Fold up metal and plastic banding, flatten and place in designated area for recycling.

## **Part 2 Products**

### **2.1 SUMP PUMP SUBMERSIBLE**

- .1 Capacity: 1.6 L/s at 44 kPa head with NPS 38 mm discharge.
- .2 Construction: simplex CSA approved, housing epoxy coated cast iron, bronze fitted stainless steel all bronze stainless steel shaft, non-clog bronze impeller, mechanical shaft seal.
- .3 Motor: 1/3 hp hermetically sealed, with automatic overload protection.
- .4 Control: buoyant case and switch and simplex control box.
- .5 Acceptable manufacturers: Sulzer/ABS, Myers, Flygt.

## **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 tank pit mounted pump assembly after mounting and securing 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.

### 3.4 **START-UP**

- .1 General:
  - .1 Procedures:
    - .1 Check power supply.
    - .2 Start pumps, check impeller rotation.
    - .3 Check for safe and proper operation.
    - .4 Check settings, operation of operating, limit, safety controls, over-temperature, audible/visual alarms, other protective devices.
    - .5 Check base for free-floating, no obstructions under base.
    - .6 Adjust alignment of piping and conduit to ensure full flexibility.
    - .7 Eliminate causes of cavitation, flashing, air entrainment.

### 3.5 **PV - SANITARY PUMPS**

- .1 Application tolerances:
  - .1 Flow: plus 10%; minus 10%.
  - .2 Pressure: plus 10%; Minus 5%.
- .2 Timing:
  - .1 Before turnover of space to tenant.
- .3 PV Procedures:
  - .1 Fill sump at rate slower than capacity of pump.
  - .2 Record levels at which pump starts and stops. Determine flow rate by observing time taken to down water level.
  - .3 Check level at which high water level alarm starts and stops. Adjust as necessary.
- .4 Check removability of pumps for servicing without interfering with installation or operation of other equipment.
- .5 Verify non-clog capability and maximum size of solids, using procedures recommended by manufacturer.

### 3.6 **REPORTS**

- .1 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.

### 3.7 **TRAINING**

- .1 Allow for 2 hours of training for site operation and maintenance staff.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 22 05 00 – Common Work Results for Plumbing.
- .2 Section 23 05 93 – Testing, Adjusting and Balancing for HVAC.

**1.2 REFERENCES**

- .1 American National Standards Institute (ANSI)/American Society of Mechanical Engineers International (ASME)
  - .1 ANSI/ASME B16.15-06, Cast Bronze Threaded Fittings, Classes 125 and 250.
  - .2 ANSI/ASME B16.18-12, Cast Copper Alloy Solder Joint Pressure Fittings.
  - .3 ANSI/ASME B16.22-13, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
  - .4 ANSI/ASME B16.24-11, Cast Copper Alloy Pipe Flanges and Flanged Fittings, Class 150, 300, 400, 600, 900, 1500 and 2500.
- .2 ASTM International Inc.
  - .1 ASTM A307-12, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .2 ASTM A536-84(2004) e1, Standard Specification for Ductile Iron Castings.
  - .3 ASTM B88-09, Standard Specification for Seamless Copper Water Tube (Metric).
- .3 American National Standards Institute/American Water Works Association (ANSI)/(AWWA)
  - .1 ANSI/AWWA C111/A21.11-12, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
- .4 Canadian Standards Association (CSA International)
  - .1 CSA B242-05 (R2011), Groove and Shoulder Type Mechanical Pipe Couplings.
- .5 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act, 1999, c. 33 (CEPA).
- .6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .7 Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS).
  - .1 MSS-SP-70-11, Gray Iron Gate Valves, Flanged and Threaded Ends.
  - .2 MSS-SP-71-11, Gray Iron Swing Check Valves, Flanged and Threaded Ends.
  - .3 MSS-SP-80-13, Bronze Gate, Globe, Angle and Check Valves.
- .8 National Research Council (NRC)/Institute for Research in Construction
  - .1 NRCC 38728, National Plumbing Code of Canada (NPC) - 1995.

- .9 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 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 Place materials defined as hazardous or toxic in designated containers.

## **Part 2 Products**

### **2.1 PIPING**

- .1 Domestic hot, cold and recirculation systems, within building.
  - .1 Above ground: copper tube, hard drawn, type L: to ASTM B88M.
  - .2 Buried or embedded: copper tube, soft annealed, type K: to ASTM B88M, in long lengths and with no buried joints.

### **2.2 FITTINGS**

- .1 Bronze pipe flanges and flanged fittings, Class 150 and 300: to ANSI/ASME B16.24.
- .2 Cast bronze threaded fittings, Class 125 and 250: 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 1 and smaller: wrought copper to ANSI/ASME B16.22 cast copper to ANSI/ASME B16.18. Suitable for operating pressure to 1380 kPa.

### **2.3 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.

## **2.4 BALL VALVES**

- .1 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 as specified Section 23 05 23.01 - Valves - Bronze.
- .2 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 as specified Section 23 05 23.01 - Valves - Bronze.

## **2.5 INSULATION**

- .1 All domestic water piping shall be complete with 25 mm glass fibre insulation and all service jacket vapour barrier.

## **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 NPC, local authority having jurisdiction and Nova Scotia's Plumbing Code, whichever is more stringent.
- .2 Assemble piping using fittings manufactured to ANSI standards.
- .3 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.
- .4 Connect to fixtures and equipment in accordance with manufacturer's written instructions unless otherwise indicated.

### **3.3 VALVES**

- .1 Isolate equipment, fixtures and branches with ball valves.

### **3.4 PRESSURE TESTS**

- .1 Test pressure: greater of 1 times maximum system operating pressure or 860 kPa.

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**3.5 FLUSHING AND CLEANING**

- .1 Flush entire system for 8 h. Ensure outlets flushed for 2 hours. Let stand for 24 hours, then draw one sample off longest run. Submit to testing laboratory to verify that system is clean copper to Provincial or Federal potable water guidelines, whichever is more stringent. Let system flush for additional 2 hours, then draw off another sample for testing.

**3.6 PERFORMANCE VERIFICATION**

- .1 Scheduling:
  - .1 Verify system performance after pressure and leakage tests and disinfection are completed.
- .2 Procedures:
  - .1 Verify that flow rate and pressure meet Design Criteria.
  - .2 Adjust pressure regulating valves while withdrawal is maximum and inlet pressure is minimum.
  - .3 Sterilize HWS and HWC systems for Legionella control.
  - .4 Verify performance of temperature controls.
  - .5 Verify compliance with safety and health requirements.
  - .6 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.
  - .7 Confirm water quality consistent with supply standards, and ensure no residuals remain as result of flushing or cleaning.

**3.7 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.

**END OF SECTION**

**Part 1 General**

**1.1 REFERENCES**

- .1 ASTM International Inc.
  - .1 ASTM B32-08, Standard Specification for Solder Metal.
  - .2 ASTM B306-02, Standard Specification for Copper Drainage Tube (DWV).
  - .3 ASTM C564-03a, Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
- .2 Canadian Standards Association (CSA International).
  - .1 CAN/CSA-B70-12, Cast Iron Soil Pipe, Fittings and Means of Joining.
  - .2 CAN/CSA-B125.3-12, Plumbing Fittings.

**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 adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.

**1.3 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

**Part 2 Products**

**2.1 COPPER TUBE AND FITTINGS**

- .1 Above ground sanitary and vent Type DWV to: ASTM B306.
  - .1 Fittings:
    - .1 Cast brass: to CAN/CSA-B125.3.
    - .2 Wrought copper: to CAN/CSA-B125.3.
  - .2 Solder: tin-lead, 50:50, Type 50A, to ASTM B32.

**2.2 CAST IRON PIPING AND FITTINGS**

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

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

### **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 National Plumbing Code, Provincial Plumbing Code, and local authority having jurisdiction, whichever is more stringent.

#### **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 that cleanout rods can probe as far as the next cleanout, at least.
- .2 Test to ensure traps are fully and permanently primed.
- .3 Ensure that fixtures are properly anchored, connected to system and effectively vented.
- .4 Affix applicable label (sanitary, vent, etc.) c/w directional arrows.

**END OF SECTION**

**Part 1 General**

**1.1 REFERENCES**

- .1 ASTM International
  - .1 ASTM A126-04 (2009), Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
  - .2 ASTM B62-09, Standard Specification for Composition Bronze or Ounce Metal Castings.
- .2 American Water Works Association (AWWA)
  - .1 ANSI/AWWA C700-09, Standard for Cold Water Meters-Displacement Type, Bronze Main Case.
  - .2 ANSI/AWWA C701-12, Standard for Cold Water Meters-Turbine Type for Customer Service.
  - .3 ANSI/AWWA C702-10, Standard for Cold Water Meters-Compound Type.
- .3 CSA International
  - .1 CSA-B64 Series-11, Backflow Preventers and Vacuum Breakers.
  - .2 CSA B79-08 (R2013), Commercial and Residential Drains and Cleanouts.
  - .3 CAN/CSA-B356-10, Water Pressure Reducing Valves for Domestic Water Supply Systems.
- .4 Efficiency Valuation Organization (EVO)
  - .1 International Performance Measurement and Verification Protocol (IPMVP).
    - .1 IPMVP 2007 Version.
- .5 Plumbing and Drainage Institute (PDI)
  - .1 PDI-G101-R2010, Testing and Rating Procedure for Grease Interceptors with Appendix of Installation and Maintenance.
  - .2 PDI-WH201-R2010, Water Hammer Arresters Standard.

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for plumbing products and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Nova Scotia, Canada.
  - .2 Indicate on drawings to indicate materials, finishes, method of anchorage, number of anchors, dimensions construction and assembly details accessories for following: soap dispensing system.

- .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .5 Instructions: submit manufacturer's installation instructions.

### **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 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 off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect plumbing materials from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **Part 2 Products**

### **2.1 HUB DRAINS**

- .1 Hub Drains: to CSA B79.
- .2 Type 1: general duty; cast iron body round, conical, 75mm inlet, integral trap with primer connection.

### **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, polished nickel bronze, round cover with flush head screws, bevelled edge frame complete with anchoring lugs.
  - .2 Floor Access: round, cast iron body and frame with adjustable secured nickel bronze top and cast box with anchor lugs and:
    - .1 Plugs: bolted bronze with neoprene gasket.

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

### **2.3 WATER HAMMER ARRESTORS**

- .1 Stainless steel construction, bellows type: to PDI-WH201.

### **2.4 TRAP SEAL PRIMERS**

- .1 Brass, with integral vacuum breaker, NPS 1/2 solder ends, NPS 1/2 drip line connection.

## **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 PWGSC Representative.
  - .2 Inform PWGSC Representative 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 PWGSC Representative.

### **3.2 MANUFACTURER'S INSTRUCTIONS**

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

### **3.3 INSTALLATION**

- .1 Install in accordance with National Plumbing Code of Canada, provincial codes, or local authority having jurisdiction, whichever is more stringent.
- .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 where indicated.

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**3.6 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 PWGSC Representative.
- .3 Install soft copper or plastic tubing to floor drain.

**3.7 START-UP**

- .1 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.
- .2 Provide continuous supervision during start-up.

**3.8 TESTING AND ADJUSTING**

- .1 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.
- .2 Access doors:
  - .1 Verify size and location relative to items to be accessed.
- .3 Cleanouts:
  - .1 Verify covers are gas-tight, secure, yet readily removable.
- .4 Water hammer arrestors:
  - .1 Verify proper installation of correct type of water hammer arrester.

**3.9 CLEANING**

- .1 Progress Cleaning:
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
- .3 Waste Management: separate waste materials for reuse recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**3.10 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 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-B45 Series-02 (R2013), Plumbing Fixtures.
  - .2 CAN/CSA-B125.3-12, Plumbing Fittings.
  - .3 CAN/CSA-B651-12, Accessible Design for the Built Environment.

**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 fixtures, and include product characteristics, performance criteria, physical size, finish and limitations.

**1.3                CLOSEOUT SUBMITTALS**

- .1 Provide maintenance data in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Include:
  - .1 Description of fixtures and trim, giving manufacturer's name, type, model, year, capacity.
  - .2 Details of operation, servicing, maintenance.
  - .3 List of recommended spare parts.

**1.4                DELIVERY, STORAGE AND HANDLING**

- .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
- .2 Packaging Waste Management: remove for recycling packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**Part 2            Products**

**2.1                MANUFACTURED UNITS**

- .1 Fixtures: manufacture in accordance with CAN/CSA-B45 series.
- .2 Trim, fittings: manufacture in accordance with CAN/CSA-B125.
- .3 Exposed plumbing brass to be chrome plated.
- .4 Number, locations: architectural drawings to govern.
- .5 Fixtures to be product of one manufacturer.

- .6 Trim to be product of one manufacturer.
- .7 Stainless steel counter-top sinks.
  - .1 KS-1: single compartment, ledge-back.
    - .1 From 1.0 mm thick type 302 stainless steel, self-rimming, with deck, undercoated, clamps. Overall size: 520 x 510 x 180 mm.
    - .2 Trim: Re-use existing from 2nd Floor Kitchenette.
    - .3 Waste fitting: integral stainless steel basket strainer/stopper, tailpiece, cast brass P-trap with cleanout.
    - .4 Acceptable manufacturers: American Standard, Kohler, Elkay.
- .8 Fixture piping:
  - .1 Hot and cold water supplies to each fixture:
    - .1 Chrome plated flexible supply pipes each with screwdriver stop, reducers, escutcheon.
  - .2 Waste:
    - .1 Brass P trap with clean out on each fixture not having integral trap.
    - .2 Chrome plated in all exposed places.
    - .3 ADA compliant with insulation and cover.

### **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 Mounting heights:
  - .1 Standard: to comply with manufacturer's recommendations unless otherwise indicated or specified.
  - .2 Physically handicapped: to comply with most stringent of either NBCC or CAN/CSA-B651.

#### **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 Checks:
  - .1 Aerators: operation, cleanliness.

- .2 Vacuum breakers, backflow preventers: operation under all conditions.
- .3 Wash fountains: operation of flow-actuating devices.

**3.4 CLEANING**

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**END OF SECTION**