

PART 1 - GENERAL

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| <u>1.1 SUMMARY</u>                             | .1 | Section Includes:<br>.1 Materials and installation for plumbing pumps.  |
| <u>1.2 ACTION AND INFORMATIONAL SUBMITTALS</u> | .1 | Shop Drawings.<br>.1 Submit shop drawings to indicate:<br>.1 Equipment, including connections, fittings, control assemblies and ancillaries. Identify whether factory or field assembled.<br>.2 Wiring and schematic diagrams.<br>.3 Dimensions and recommended installation.<br>.4 Pump performance and efficiency curves. |
|  | .2 | Closeout submittals: submit maintenance and engineering data for incorporation into manual.<br>.1 Manufacturers name, type, model year, capacity and serial number.<br>.2 Details of operation, servicing and maintenance.<br>.3 Recommended spare parts list with names and addresses.                                     |

PART 2 - PRODUCTS

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| <u>2.1 SUMP PUMP SUBMERSIBLE</u> | .1 | Capacity: As indicated on drawings.   |
|                                  | .2 | Construction: simplex CSA approved, housing epoxy coated cast iron, stainless steel shaft, non-clog bronze impeller, mechanical shaft seal. |
|                                  | .3 | Motor: as indicated hermetically sealed, with automatic overload protection.  |
|                                  | .4 | Control: buoyant float and switch.  |
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PART 3 - EXECUTION

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| <u>3.1 MANUFACTURER'S INSTRUCTIONS</u> | .1 | Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet. |
| <u>3.2 INSTALLATION</u>                | .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.   |
| <u>3.3 START-UP</u>                    | .1 | Site Tests/Inspection:<br>.1 Check power supply.  |
|  | .2 | Start-up, check for proper and safe operation.  |
|  | .3 | Check settings and operation of float control. Ensure minimum one minute run time.  |
|  | .4 | Adjust flow at globe valve so that floor drain does not overflow.   |

## PART 1 - GENERAL

- 1.1 REFERENCES
- .1 American National Standards Institute (ANSI)/American Society of Mechanical Engineers International (ASME)
    - .1 ANSI/ASME B16.15-2011, Cast Bronze Threaded Fittings, Classes 125 and 250.
    - .2 ANSI/ASME B16.18-2012, Cast Copper Alloy Solder Joint Pressure Fittings.
    - .3 ANSI/ASME B16.22-R2010, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
  - .2 ASTM International Inc.
    - .1 ASTM B 88M-2011, Standard Specification for Seamless Copper Water Tube (Metric).
  - .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
    - .1 Material Safety Data Sheets (MSDS).
  - .4 Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS).
    - .1 MSS-SP-67-2011, Butterfly Valves.
    - .2 MSS-SP-70-2011, Gray Iron Gate Valves, Flanged and Threaded Ends.
    - .3 MSS-SP-71-2011, Gray Iron Swing Check Valves, Flanged and Threaded Ends.
    - .4 MSS-SP-80-2008, Bronze Gate, Globe, Angle and Check Valves.
  - .5 National Research Council (NRC)/Institute for Research in Construction
    - .1 NRCC 38728, National Plumbing Code of Canada (NPC) - 2010.

## 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 B 88M.
- 2.2 FITTINGS
- .1 Cast bronze threaded fittings, Class 125: to ANSI/ASME B16.15.
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- .2 Cast copper, solder type: to ANSI/ASME B16.18.
- .3 Wrought copper and copper alloy, solder type: to ANSI/ASME B16.22.
- .4 NPS 1 ½ and smaller : wrought copper to ANSI/ASME B16.22 or cast copper to ANSI/ASME B16.18. Suitable for operating pressure to 1380 kPa.

### 2.3 JOINTS

- .1 Solder: 95/5 tin copper alloy.
- .2 Teflon tape: for threaded joints.
- .3 Dielectric connections between dissimilar metals: dielectric fitting, complete with thermoplastic liner.

### 2.4 BALL VALVES

- .1 NPS 2 and under, screwed or soldered:
  - .1 Class 150.
  - .2 Bronze body, chrome plated brass ball, PTFE adjustable packing, brass gland and PTFE seat, steel lever handle.
  - .3 Acceptable material: Crane F9202.
  - .4 Other acceptable manufacturers: Jenkins, Red White, Watts.

## 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 and Provincial requirements.
  - .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.
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- .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.

### 3.3 VALVES

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

### 3.4 FLUSHING AND CLEANING

- .1 Flush entire system for 8 h. Ensure outlets flushed for 2 hours.

### 3.5 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials for reuse and recycling.

## PART 1 - GENERAL

- 1.1 REFERENCES
- .1 ASTM International Inc.
    - .1 ASTM B 32-08, Standard Specification for Solder Metal.
    - .2 ASTM B 306-13, Standard Specification for Copper Drainage Tube (DWV).
  - .2 Canadian Standards Association (CSA International).
    - .1 CSA B67-1972(R1996), Lead Service Pipe, Waste Pipe, Traps, Bends and Accessories.
    - .2 CAN/CSA-B70-06, Cast Iron Soil Pipe, Fittings and Means of Joining.
    - .3 CAN/CSA-B125.3-05, Plumbing Fittings.

## PART 2 - PRODUCTS

- 2.1 COPPER TUBE AND FITTINGS
- .1 Above ground sanitary Type DWV to: ASTM B 306.
    - .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 B 32.

## 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 National Plumbing Code Provincial Plumbing Code and local authority having jurisdiction.
- 3.3 TESTING
- .1 Pressure test buried systems before backfilling.
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- .2   Hydraulically test to verify grades and freedom from obstructions.

#### 3.4 PERFORMANCE VERIFICATION

- .1   Affix applicable label (storm, sanitary, vent, pump discharge etc.) c/w directional arrows every floor or 4.5 m (whichever is less).

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| <u>1.1 REFERENCES</u>                          | .1 | ASTM International Inc.<br>.1 ASTM D 2564-04(2011), Standard Specification for Solvent Cements for Poly(Vinyl-Chloride) (PVC) Plastic Piping Systems. |
|  | .2 | Canadian Standards Association (CSA International)<br>.1 CAN/CSA-Series B1800-06, Thermoplastic Nonpressure Pipe Compendium - B1800 Series.           |
| <u>1.2 ACTION AND INFORMATIONAL SUBMITTALS</u> | .1 | Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.  |
| <u>1.3 DELIVERY, STORAGE AND HANDLING</u>      | .1 | Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.  |
|  | .2 | Store at temperatures and conditions recommended by manufacturer.   |

## PART 2 - PRODUCTS

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|--------------------------------|----|--|
| <u>2.1 PIPING AND FITTINGS</u> | .1 | For buried and or above ground DWV piping to:<br>.1 CAN/CSA B1800. |
| <u>2.2 JOINTS</u>              | .1 | Solvent weld for PVC: to ASTM D 2564.                              |

## PART 3 - EXECUTION

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| <u>3.1 APPLICATION</u> | .1 | Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets. |
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- 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 except .
- 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).

PART 1 - GENERAL

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| <u>1.1 SUMMARY</u>                             | .1 | Section Includes:<br>.1 Materials and installation for plumbing specialties and accessories.   |
| <u>1.2 REFERENCES</u>                          | .1 | American Society for Testing and Materials International (ASTM).<br>.1 ASTM A 126-04(2009), Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.<br>.2 ASTM B 62-09, Specification for Composition Bronze or Ounce Metal Castings.  |
|  | .2 | Canadian Standards Association (CSA International).<br>.1 CSA-B64 Series-11, Backflow Preventers and Vacuum Breakers.<br>.2 CSA-B79-08, commercial and residential drains and cleanouts.<br>.3 CSA-B356-10, Water Pressure Reducing Valves for Domestic Water Supply Systems.                                      |
|  | .3 | Health Canada/Workplace Hazardous Materials Information System (WHMIS).<br>.1 Material Safety Data Sheets (MSDS).  |
|  | .4 | Plumbing and Drainage Institute (PDI).<br>.1 PDI-WH201-2006, Water Hammer Arresters Standard.  |
| <u>1.3 ACTION AND INFORMATIONAL SUBMITTALS</u> | .1 | Product Data:<br>.1 Submit manufacturer's printed product literature, specifications and datasheet for fixtures and equipment.<br>.2 Indicate dimensions, construction details and materials for specified items.<br>.3 Submit WHMIS MSDS. Indicate VOC's for adhesive and solvents during application and curing. |
|  | .2 | Shop Drawings:<br>.1 Submit shop drawings to indicate materials, finishes, dimensions, construction and assembly details and accessories.  |
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## PART 2 - PRODUCTS

- 2.1 FLOOR DRAINS
- .1 Open throat funnel floor drain, epoxy coated cast iron body with bottom outlet, adjustable nickel bronze round strainer with secured throat oval funnel.
    - .1 Acceptable Product: Zurn Z211-BF or approved equal.
    - .2 Other acceptable manufacturers: JR Smith, Watts.
  - .2 General Duty floor drain, cast iron body, round adjustable head, nickel bronze strainer, adjustable clamping collar.
    - .1 Acceptable Product: Zurn 2N415-BF-AR or approved equal.
    - .2 Other acceptable manufacturers: JR Smith, Watts.
- 2.2 CLEANOUTS
- .1 Access Covers:
    - .1 Floor Access: round cast iron body and frame with adjustable secured top and:
      - .1 Plugs: bolted bronze with neoprene gasket.
      - .2 Cover for Unfinished Concrete Floors: cast iron round, gasket, vandal-proof screws.
        - .1 Acceptable Product: Zurn Z1400.
        - .2 Other acceptable manufacturers: JR Smith, Watts.
- 2.3 PRESSURE REGULATORS
- .1 Condenser Water Makeup Water: Bronze construction, adjustable pressure output from 0 to 55 kPa, C/W integral strainer to ASTM B62/
    - .1 Acceptable Material: Watts 3/8" LF 215.
    - .2 Other acceptable manufacturers: Wilkens, Febco.
- 2.4 HOSE BIBBS AND SEDIMENT FAUCETS (INDOORS)
- .1 Bronze construction complete with integral back flow preventer, hose thread spout, replaceable composition disc.
    - .1 Acceptable Material: Zurn Z1341-BFP or approved equal.
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.2 Other acceptable manufacturers: JR Smith, Watts.

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| <u>2.5 WATER METERS</u>         | .1 | Reference Section 23 25 00 HVAC WATER TREATMENT SYSTEMS.  |
| <u>2.6 STRAINERS</u>            | .1 | 125 psi, Y type with 20 mesh, monel, bronze or stainless steel removable screen.  |
|                                 | .2 | NPS2 and under, bronze body, screwed ends, with brass cap.  |
|                                 | .1 | Acceptable Material: Nibco T221.  |
|                                 | .2 | Other acceptable manufacturers: Crane, Armstrong, Febco.  |
| <u>2.7 BACK FLOW PREVENTERS</u> | .1 | Preventers: to CSA-B64 Series, application, reduced pressure principle type back flow preventer with intermediate relief valve. |
|                                 | .1 | Acceptable Material Domestic Building Service Entrance: Watts 50 mm 009-QTS with air gap fitting and strainer.                  |
|                                 | .2 | Other acceptable manufacturers: Wilkens and Febco.  |

### PART 3 - EXECUTION

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| <u>3.1 MANUFACTURER'S INSTRUCTIONS</u> | .1 | Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet. |
| <u>3.2 INSTALLATION</u>                | .1 | Install in accordance with National Plumbing Code of Canada.  |
|  | .2 | Install in accordance with manufacturer's instructions and as specified.  |
| <u>3.3 CLEANOUTS</u>                   | .1 | Install cleanouts at base of soil and waste stacks, and rainwater leaders, at locations required code, and as indicated.  |
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.2 Bring cleanouts to wall or finished floor unless serviceable from below floor.

.3 Building drain cleanout and stack base cleanouts: line size to maximum NPS4.

#### 3.4 HOSE BIBBS AND SEDIMENT FAUCETS

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

#### 3.5 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.

#### 3.6 TESTING AND ADJUSTING

- .1 Adjustments:
- .1 Verify that flow rate and pressure meet design criteria.
  - .2 Make adjustments while flow rate or withdrawal is (1) maximum and (2) 25% of maximum and while pressure is (1) maximum and (2) minimum.
- .2 Floor drains:
- .1 Verify operation of trap seal primer.
  - .2 Prime, using trap primer. Adjust flow rate to suit site conditions.
  - .3 Check security, accessibility, removeability of strainer.
  - .4 Clean out baskets.
- .3 Access doors:
- .1 Verify size and location relative to items to be accessed.
- .4 Cleanouts:
- .1 Verify covers are gas-tight, secure, yet readily removable.
- .5 Pressure regulators, PRV assemblies:
- .1 Adjust settings to suit locations, flow rates, pressure conditions.
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- .6 Strainers:
  - .1 Clean out repeatedly until clear.
  - .2 Verify accessibility of cleanout plug and basket.
  - .3 Verify that cleanout plug does not leak.