

PART 1 - GENERAL

1.1 MINIMUM STANDARDS

- .1 National Plumbing Code.
- .2 Canadian Standards Association Standards.
- .3 Local Municipal By-laws and Regulations.
- .4 National Building Code of Canada (NBC) 2010.
- .5 National Fire Code of Canada 2010 (NFC)
- .6 FCC No. 403(M)-1985 Sprinkler Systems
- .7 CSA B651-12, Accessible Design for the Built Environment.

1.2 REFERENCES

- .1 Materials Standards:
 - .1 ASME A112.18.1-2005/CSA-B125.1-05, Plumbing Supply Fittings.
 - .2 ASME A112.18.2-2005/CSA-B125.2-05, Plumbing Waste Fittings.
 - .3 ASME B16.22-2001(R2010), Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
 - .4 ASTM B88M-05, Standard Specification for Seamless Copper Water Tube (Metric).
 - .5 ASTM B209-10, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - .6 ASTM B306-09, Standard Specification for Copper Drainage Tube (DWV).
 - .7 ASTM D2564-04(2009)e1, Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.
 - .8 CAN/CSA-B70-06, Cast Iron Soil Pipe, Fittings and Means of Joining.
 - .9 CAN/CSA-B125.3-05, Plumbing Fittings.
 - .10 CAN/CSA-B149.1-10, Natural Gas and Propane Installation Code.
 - .11 CAN/CSA-B181.2-M90, PVC Drain, Waste and Vent Pipe and Fittings.
 - .12 Thermal Insulation Association of Canada (TIAC): National Insulation Standards.

1.3 SHOP DRAWINGS AND PRODUCT DATA SHEETS

- .1 Submit shop drawings and product data sheets in accordance with Sections 01 11 01, 01 33 00, 01 78 00 and 23 05 00 for the following:
 - .1 Plumbing fixtures.

PART 2 - PRODUCTS

2.1 WATER PIPE AND FITTINGS

- .1 Above ground water piping size 50 mm and smaller: copper tube type L to ASTM B88M with sweat wrought copper fittings to ASME B16.22.
- .2 Make joints with 95:5 antimonial tin solder.

2.2 VALVES

- .1 Gate valve size 50 mm and smaller: bronze, rising stem, wedge disc, solder joint ends, ANSI Class 125, 1.4 MPa cold working pressure non-shock.
- .2 Globe valve size 50 mm and smaller: bronze, solder joint ends, renewable composition disc, ANSI Class 125, 1.4 MPa cold working pressure non-shock.
- .3 Check valve size 50 mm and smaller: bronze swing check, solder joint ends, ANSI 125, 1.4 MPa cold working pressure non-shock.
- .4 Provide gate valves at each piece of plumbing equipment and at each branch line take-off, and globe valves where balancing is required.

2.3 PLUMBING FIXTURES

- .1 Hose Bibb:
 - .1 Inside hose bibs to be hose thread connection type faucet with 5 rib handle c/w vacuum breaker.

2.4 FIXTURE CONNECTIONS

- .1 Fixtures shall be serviced as follows:

Fixture	Waste (mm)	Vent (mm)	C.W. (mm)	H.W. (mm)
Hose Bibb	--	--	15	--

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Install material and fixtures in accordance with referenced standards and manufacturer's written instructions.

3.2 ADJUSTING

- .1 Conform to water conservation requirements specified this section.
- .2 Adjustments:
 - .1 Adjust pressure to fixtures to ensure no splashing at maximum pressures.
- .3 Checks:
 - .1 Vacuum breakers: operation under all conditions.
- .4 Refer to other Sections for requirements of commissioning.

END OF SECTION

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 Copper Alloy Threaded Fittings: Classes 125 and 250.
 - .2 ANSI B16.18-01(R2005), Cast Copper Alloy Solder Joint Pressure Fittings.
 - .3 ANSI/ASME B16.22-01(R2005), Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
 - .4 ANSI/ASME B16.24-2001(2006), Cast Copper Alloy Pipe Flanges and Flanged Fittings, Class 150, 300, 400, 600, 900, 1500 and 2500.
- .2 ASTM International Inc. (ASTM)
 - .1 ASTM A307-10, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .2 ASTM B88M-05(2011), Standard Specification for Seamless Copper Water Tube (Metric).
- .3 American Water Works Association (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-67-2002a, Butterfly Valves.
 - .2 MSS-SP-70-2006, Gray Iron Gate Valves, Flanged and Threaded Ends.
 - .3 MSS-SP-71-2005, Gray Iron Swing Check Valves, Flanged and Threaded Ends.
 - .4 MSS-SP-80-2008, Bronze Gate, Globe, Angle and Check Valves.
- .8 National Research Council (NRC)/Institute for Research in Construction
 - .1 NRCC 47668, National Plumbing Code of Canada (NPC) - 2010.

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| <u>1.2 ACTION AND
INFORMATIONAL
SUBMITTALS</u> | .1 | Provide submittals in accordance with Section 01 11 01 01 33 00. |
| | .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 11 01 and 01 78 00. |

PART 2 - PRODUCTS

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| <u>2.1 SUSTAINABLE
REQUIREMENTS</u> | .1 | Not Used. |
| <u>2.2 PIPING</u> | .1 | Domestic hot, cold and recirculation systems, within building. |
| | .1 | Above ground: copper tube, hard drawn, type L: to ASTM B88M. |
| <u>2.3 FITTINGS</u> | .1 | 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. |

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. |
| <u>3.2 INSTALLATION</u> | .1 | Install in accordance with NPC, local authority having jurisdiction. |
| | .2 | Install pipe work in accordance with Section 23 05 01, supplemented as specified herein. |

- .3 Assemble piping using fittings manufactured to ANSI standards.
 - .4 Connect to fixtures and equipment in accordance with manufacturer's written instructions unless otherwise indicated.
- 3.3 PRESSURE TESTS
- .1 Conform to requirements of Section 21 05 01.
 - .2 Test pressure: greater of 1 times maximum system operating pressure or 860 kPa.
- 3.4 FLUSHING AND CLEANING
- .1 Flush entire system for 8 h. Ensure outlets flushed for 2 h. Let stand for 24 h, then draw one sample off longest run. Submit to testing laboratory to verify that system is clean to Provincial potable water guidelines. Let system flush for additional 2 h, then draw off another sample for testing.
- 3.5 PRE-START-UP INSPECTIONS
- .1 Systems to be complete, prior to flushing, testing and start-up.
 - .2 Verify that system can be completely drained.
- 3.6 START-UP
- .1 Timing: Start up after:
 - .1 Pressure tests have been completed. Certificate of static completion has been issued.
 - .2 Certificate of static completion has been issued.
 - .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.
 - .4 Rectify start-up deficiencies.
- 3.7 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 Sterilize HWS and HWC systems for Legionella control.
- .3 Verify performance of temperature controls.
- .4 Verify compliance with safety and health requirements.

3.10 OPERATION
REQUIREMENTS

- .1 Co-ordinate operation and maintenance requirements including, cleaning and maintenance of specified materials and products with Section 23 05 01.

3.11 CLEANING

- .1 Clean in accordance with Section 01 11 01 and 01 74 11.

END OF SECTION

PART 1 - GENERAL

- 1.1 SUMMARY
- .1 Section Includes:
- .1 Materials and installation for plumbing specialties and accessories.
- 1.2 REFERENCES
- .1 American Society for Testing and Materials International (ASTM).
- .1 ASTM A126-04(2009), Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
- .2 ASTM B62-09, Standard Specification for Composition Bronze or Ounce Metal Castings.
- .2 Canadian Standards Association (CSA International).
- .1 CSA B356-00(R2005), Water Pressure Reducing Valves for Domestic Water Supply Systems.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
- .1 Material Safety Data Sheets (MSDS).
- 1.3 SUBMITTALS
- .1 Submittals in accordance with Section 01 33 00.
- .2 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and datasheet for fixtures and equipment.
- .2 Indicate dimensions, construction details and materials for specified items.
- .3 Submit WHMIS MSDS. Indicate VOC's for adhesive and solvents during application and curing.
- .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 Closeout submittals: submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00, include:
- .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.

<u>1.4 DELIVERY, STORAGE AND HANDLING</u>	.1	Store and manage hazardous materials in accordance with Section 23 05 00.
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PART 2 - PRODUCTS

<u>2.1 MATERIALS</u>	.1	Materials and resources in accordance with Section 23 05 00.
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<u>2.2 VACUUM BREAKERS</u>	.1	Breakers: to CSA B64 Series, vacuum breaker hose connection.
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<u>2.3 HOSE BIBBS AND SEDIMENT FAUCETS</u>	.1	Bronze construction complete with integral back flow preventer, hose thread spout, replaceable composition disc, and chrome plated in finished areas.
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PART 3 - EXECUTION

<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.
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<u>3.2 INSTALLATION</u>	.1	Install in accordance with National Plumbing Code of Canada and local authority having jurisdiction.
	.2	Install in accordance with manufacturer's instructions and as specified.

<u>3.3 WATER HAMMER ARRESTORS</u>	.1	Install on branch supplies to fixtures or group of fixtures where indicated.
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<u>3.4 HOSE BIBBS AND SEDIMENT FAUCETS</u>	.1	Install at bottom of risers, at low points to drain systems, and as indicated.
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<u>3.5 START-UP</u>	.1	General: .1 In accordance with Section 23 05 00: General Requirements, supplemented as specified herein.
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- .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.

3.6 TESTING AND ADJUSTING

- .1 General:
 - .1 In accordance with Section 23 05 00: 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 Application tolerances:
 - .1 Pressure at fixtures: +/- 70 kPa.
 - .2 Flow rate at fixtures: +/- 20%.
- .4 Adjustments:
 - .1 Verify that flow rate and pressure meet design criteria.
 - .2 Make adjustments while flow rate or withdrawal is maximum And while pressure is maximum.
- .5 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.
- .6 Hose bibbs, sediment faucets:
 - .1 Verify complete drainage.
 - .2 Verify operation of hose bibb.
- .7 Training:
 - .1 In accordance with Section 01 79 00: Training of O&M Personnel, supplemented as specified.
 - .2 Demonstrate full compliance with Design Criteria.

END OF SECTION