

PART 1 - GENERAL

- 1.1 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 B16.18-01, Cast Copper Alloy Solder
Joint Pressure Fittings.
 - .3 ANSI/ASME B16.22-01, Wrought Copper and Copper
Alloy Solder Joint Pressure Fittings.
 - .4 ANSI/ASME B16.24-01, Cast Copper Alloy Pipe
Flanges and Flanged Fittings, Class 150, 300, 400,
600, 900, 1500 and 2500.
 - .2 ASTM International Inc.
 - .1 ASTM A 307-07b, Standard Specification for
Carbon Steel Bolts and Studs, 60,000 PSI Tensile
Strength.
 - .2 ASTM A 536-84(2004)e1, Standard Specification
for Ductile Iron Castings.
 - .3 ASTM B 88M-05, Standard Specification for
Seamless Copper Water Tube (Metric).
 - .3 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act, 1999, c.
33 (CEPA).
 - .4 Health Canada/Workplace Hazardous Materials
Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
 - .5 Manufacturer's Standardization Society of the Valve
and Fittings Industry (MSS).
 - .1 MSS-SP-80-03, Bronze Gate, Globe, Angle and
Check Valves.
 - .6 National Research Council (NRC)/Institute for
Research in Construction
 - .1 NRCC 38728, National Plumbing Code of Canada
(NPC) - 2010.
 - .7 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992, c.
34 (TDGA).

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 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.

1.3 DELIVERY,
STORAGE AND
HANDLING

- .1 Packaging Waste Management: remove for reuse padding and packaging materials in accordance with Section 01 10 10 - General Instructions.
- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Handle and dispose of hazardous materials in accordance with CEPA , TDGA , Regional and Municipal regulations.

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 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 1 ½ and smaller : wrought copper to ANSI/ASME B16.22 or cast copper to ANSI/ASME B16.18; with

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- 2.2 FITTINGS (Cont'd) .5 NPS 1 ½ and smaller :(Cont'd)
301stainless steel internal components and EPDM
seals. 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 A 307,
heavy series.
- .3 Solder: 95/5 tin copper alloy.
- .4 Teflon tape: for threaded joints.
- .5 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, stainless steel 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, stainless steel 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.
- 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 Plumbing and local
authority having jurisdiction.
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| <u>3.2 INSTALLATION
(Cont'd)</u> | .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. |
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| <u>3.3 VALVES</u> | .1 | Isolate equipment, fixtures and branches with ball valves. |
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| <u>3.4 PRESSURE TESTS</u> | .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. |
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| <u>3.5 FLUSHING AND
CLEANING</u> | .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 to Provincial potable water guidelines. Let system flush for additional 2 hours, then draw off another sample for testing. |
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| <u>3.6 PRE-START-UP
INSPECTIONS</u> | .1 | Systems to be complete, prior to flushing, testing and start-up. |
| | .2 | Verify that system can be completely drained. |
| | .3 | Ensure that air chambers, expansion compensators are installed properly. |
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| <u>3.7 START-UP</u> | .1 | Timing: start up after:
.1 Pressure tests have been completed.
.2 Certificate of static completion has been issued. |
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- 3.7 START-UP
(Cont'd)
- .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.
- 3.8 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 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.
- 3.9 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.
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- 3.10 CLEANING .1 Clean in accordance with Section 01 10 10 - General Instructions.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 10 10 - General Instructions.