PART 1 GENERAL

1.1 REFERENCE STANDARDS

.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.
- .4 ANSI/ASME B16.24, Cast Copper Alloy Pipe Flanges and Flanged Fittings, Class 150, 300, 400, 600, 900, 1500 and 2500.

.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 Canadian Standards Association (CSA International)

- .1 CSA B242, 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, Butterfly Valves.
- .2 MSS-SP-70, Grey Iron Gate Valves, Flanged and Threaded Ends.
- .3 MSS-SP-71, Grey Iron Swing Check Valves, Flanged and Threaded Ends.
- .4 MSS-SP-80, Bronze Gate, Globe, Angle and Check Valves.

.8 National Research Council (NRC)

- .1 National Plumbing Code of Canada (NPC).

PART 2 PRODUCT

2.1 PIPING

.1 Domestic hot, cold, and recirculation systems, located inside the building.

.1 To be installed aboveground: hard-drawn copper tube, type L: conform to ASTM B88M.

.2 To be buried or embedded: soft-annealed copper tube, type K: conform to ASTM B88M, in chunks of long lengths and with no buried joints in the buried part.

2.2 FITTINGS

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

.2 Cast bronze threaded fittings, Class 125: conform to ANSI/ASME B16.15.

.3 Cast copper, solder type: conform to ANSI/ASME B16.18.

.4 Wrought copper and copper alloy, solder type: conform to ANSI/ASME B16.22.

.5 NPS 2 or larger: conform to ANSI/ASME B16.18 or ANSI/ASME B16.22 roll grooved to CSA B242.

.6 NPS 1 ½ or smaller: wrought copper conform to ANSI/ASME B16.22 or cast copper conform to ANSI/ASME B16.18; with stainless steel internal components and EPDM seals. Suitable for operating pressure to 1380 kPa.

2.3 JOINTS

.1 Rubber gaskets: conform to AWWA C111.

.2 Hex head bolts, nuts, and washers: conform to ASTM A307, heavy series.

.3 Solder: tin copper alloy 95/5.

.4 Teflon tape: for screwed joints.

.5 Grooved couplings: designed with angle bolt pads to provide rigid joint, complete with EPDM gasket.

.6 Dielectric fittings between dissimilar metals: completed with thermoplastic liner.

2.4 SWING CHECK VALVES

.1 NPS 2 or smaller, to be soldered:

.1 Conform to MSS-SP-80, Class 125, 860 kPa, bronze body, bronze swing disc, screw in cap, regrindable seat.

.2 NPS 2 or smaller, to be screwed:

.1 Conform to MSS-SP-80, Class 125, 860 kPa, bronze body, bronze swing disc, screw in cap, regrindable seat.

2.5 BALL VALVES

.1 NPS 2 or smaller, to be screwed:

.1 Class 150.

.2 Bronze body, stainless steel ball, PTFE adjustable packing, brass gland and PTFE seat, steel lever handle.

.2 NPS 2 or smaller, to be soldered:

.1 Conform 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 conform 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, as well as datasheets.

3.2 INSTALLATION OF PIPEWORK

.1 Install the pipe work in accordance with NPC.

.2 Install the pipe work in accordance with Section 23 05 05 – Installation of Pipework, supplemented as specified herein.

.3 Assemble piping using fittings manufactured conform 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 and other written instructions unless otherwise indicated.

.6 Tubing to be buried:

.1 Lay in well compacted washed sand bedding in accordance with AWWA Class B.

.2 Bend the tubing without folding or reducing its useful section. Minimize the use of fittings.

3.3 VALVES

.1 Isolate diversion pipes and the supply lines of the sanitary equipment, branches with gate, butterfly, or ball valves.

3.4 PRESSURE TESTS

.1 Test pressure: must be as the highest of the following values or 860 kPa or the maximum system operating pressure.

3.5 FLUSHING AND CLEANING

.1 Rinse entire system for 8 hours. Rinse the water outlets for 2 hours.

3.6 PRE-START-UP INSPECTIONS

.1 Make sure that all system elements are completed prior to rinsing, testing, and start-up.

.2 Make sure that the system can be completely emptied.

.3 Make sure that boosters are operating properly.

.4 Make sure that pneumatic air chambers and expansion compensators are installed properly.

3.7 START-UP

.1 Start-up of the system after:

.1 Hydrostatic tests have been completed.

.2 Rinsing and cleaning have been completed.

.2 Provide continuous supervision during the entire 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 Bring HWS storage tank up to design temperature slowly.

.4 Monitor piping HWS and HWC piping systems for freedom of movement, pipe expansion as designed.

.5 Check control, limit, and safety devices for normal and safe operation.

.4 Rectify start-up deficiencies.

END OF SECTION