DOMESTIC WATER PIPING COPPER

1. GENERAL

1.1 Section Includes

.1 Materials and installation for copper domestic water service used in the following:

.1 Hard drawn copper domestic hot and cold water services inside building.

.2 Valves: Ball, globe, and check

1.2 Related Sections

.1 Section 22 07 19 – Plumbing Piping Insulation

.2 Section 23 05 05 - Installation of Pipework.

.3 Section 23 05 23.01 - Valves - Bronze.

.4 Section 23 05 29 – Hangers and Supports for HVAC Piping and Equipment

.5 Section 23 05 83 - Balancing

.6 Section 23 05 93 - Testing.

1.3 References

.1 American National Standards Institute (ANSI)/American Society of Mechanical Engineers International (ASME).

.1 ANSI/ASME B16.15-11, Cast Copper Alloy Threaded Fittings, Classes 125 and 250.

.2 ANSI/ASME B16.18-01(R2005), Cast Copper Alloy Solder Joint Pressure Fittings.

.3 ANSI/ASME B16.22-01(R2010), Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

.2 ASTM International, (ASTM).

.1 ASTM B 88M-05(R2011), 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-80-08, 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.

1.4 Submittals

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit product data for following: Valves.

.3 Provide maintenance data for incorporation into Operating and Maintenance Manual as specified in Section 01 33 00 - Submittal Procedures.

.4 Provide pressure test and disinfection certificates for incorporation into Operating and Maintenance Manual as specified in Section 01 33 00 - Submittal Procedures.

2. PRODUCTS

2.1 Piping

.1 Domestic hot, cold and recirculation systems, within building.

.1 Above ground: copper tube, hard drawn, type K: to ASTM B 88M.

2.2 Fittings

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

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

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

2.3 Joints

.1 Solder: 95/5 tin copper alloy.

.2 Teflon tape: for threaded joints.

.3 Dielectric connections between dissimilar metals: dielectric fitting to ASTM F 492, complete with thermoplastic liner.

2.4 Globe Valves

.1 50mm and under, screwed:

.1 To MSS-SP-80, Class 150, 1 MPa, bronze body, screwed over bonnet, renewable composition disc as specified Section 23 05 23.01 - Valves - Bronze .

.2 Lockshield handles: on domestic hot water return.

2.5 Swing Check Valves

.1 50mm and under, screwed:

.1 To MSS-SP-80, Class 125, 860 kPa, bronze body, bronze swing disc, screw in cap, re-grindable seat as specified Section 23 05 23.01 - Valves – Bronze..

2.6 Ball Valves

.1 50mm 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.

3. EXECUTION

3.1 Installation

.1 Install in accordance with NPC with Manitoba Amendments 2010 and the local authority having jurisdiction.

.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.

3.2 Valves

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

.2 Balance recirculation system using lockshield globe valves. Mark settings and record on as-built drawings on completion.

3.3 Pressure Tests

.1 Test pressure: greater of 1.5 times maximum system operating pressure or 860 kPa.

3.4 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 Ensure that pressure booster systems are operating properly.

.4 Ensure that air chambers, expansion compensators are installed properly.

3.5 Disinfection

.1 Flush out all new pipework for 8 hours, disinfect and rinse all new pipework, fittings and equipment system to requirements of authority having jurisdiction and/or the approval of Contract Administrator

.2 Add chlorine to water in system to 50 mg per litre and let stand for twenty-four (24) hours. Check chlorine content after twenty-four (24) hours and insure the content is not less than 20 mg per L. If chlorine content is less than 20 mg per L repeat process. Flush system until the chlorine content of water being drained is equal to the chlorine content of the make-up water

.3 Upon completion, provide laboratory test reports on water quality for Contract Administrator approval.

3.6 Start-Up

.1 Timing: Start up 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 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.

3.7 Performance Verification

.1 Timing:

.1 After pressure and leakage tests and disinfection 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 Test HWC in accordance with Section 23 05 93 - Testing.

.3 Balance HWC in accordance with Section 23 05 83 - Balancing.

.4 Adjust pressure regulating valves while withdrawal is maximum and inlet pressure is minimum.

.5 Sterilize HWS and HWC systems for Legionella control.

.6 Verify performance of temperature controls.

.7 Verify compliance with safety and health requirements.

.8 Confirm water quality consistent with supply standards, verifying that no residuals remain as a result of flushing and/or cleaning.

.3 Reports:

.1 Include certificate of water flow and pressure tests conducted on incoming water service, demonstrating adequacy of flow and pressure.

END OF SECTION