SECTION 22 1119 - DOMESTIC WATER PIPING SPECIALTIES

ALL LIBRARIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following domestic water piping specialties:

1. Backflow preventers.
2. Calibrated balancing valves.
3. Dual check backflow preventers.
4. Thermostatic mixing valves.
5. Strainers.
6. Wall hydrants.
7. Post hydrants.
8. Outlet boxes.
9. Drain valves.
10. Water hammer arresters.
11. Trap-seal primer valves.
12. Pressure reducing valves.
13. Water meters.
14. Hot water circulating pumps.
15. Expansion Tanks

B. Related Sections include the following:

1. Division 22 Section "Meters and Gages" for thermometers, pressure gages, and flow meters in domestic water piping.
2. Division 22 Section "Domestic Water Piping" for water meters.

1.3 PERFORMANCE REQUIREMENTS

A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig unless otherwise indicated.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Diagram power, signal, and control wiring.

C. Field quality-control test reports.

D. Operation and Maintenance Data: For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. NSF Compliance:

1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components.
2. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9."
3. Comply with Reduction of Lead in Drinking Water Act “Lead Free Law”.

C. All Thermostatic Mixing Valves shall be factory engraved with ASSE 1071. Stamping on valves or letters on factory letterhead will not be acceptable compliance.

PART 2 - PRODUCTS

2.1 BACKFLOW PREVENTERS

A. Reduced-Pressure-Principle Backflow Preventers (**RPZ**): ***Must be lead-free!!***

1. Basis-of-Design Product: Subject to compliance with requirements, provide a “lead-free” comparable product by one of the following:

a. Watts Industries, Inc.; Water Products Div.
b. Apollo, Conbraco Industries.
c. Zurn Industries, LLC; plumbing Products Group; Wilkins Water Control Products.

2. Standard: ASSE 1013.
3. Operation: Continuous-pressure applications.
4. Pressure Loss: 12 psig maximum, through middle 1/3 of flow range.
5. Size: Refer to Drawings for sizes and model numbers.
6. Maximum Pressure Loss at Design Flow Rate: 10 psig for sizes NPS 2 and smaller; 12 psig for NPS 2-1/2 and larger.
7. Body: Bronze for NPS 2 and smaller; stainless steel for NPS 2-1/2 and larger.
8. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
9. Configuration: Designed for horizontal or straight through flow.
10. Accessories:

a. Valves: Ball type with threaded ends on inlet and outlet of NPS 2 and smaller; outside screw and yoke gate-type with flanged ends on inlet and outlet of NPS 2-1/2 and larger.
b. Air-Gap Fitting: ASME A112.1.2, matching backflow-preventer connection. Extend air-gap drain full size to floor drain.

2.2 BALANCING VALVES

A. Copper-Alloy Calibrated Balancing Valves (**CBV**):

1. Basis-of-Design Product: Subject to compliance with requirements, provide a comparable product by one of the following:
   a. ITT Industries; Bell & Gossett Div., Model CB-LF.
   b. Cimberio Model #747-NL.

2. Type: Ball valve with two readout ports and lockable memory setting indicator.
3. Body: Brass.
4. Ends: Threaded, ANSI B1.20.1.
5. Size: Same as connected piping, but not larger than NPS 2.
6. Accessories: Provide meter hoses, fittings, valves, differential pressure meter, and carrying case to owner at project completion.
7. Memory-Stop balancing valves will not be allowed.

2.3 THERMOSTATIC MIXING VALVES**.**

A. Primary, Thermostatic, Water Mixing Valves (**TMV**) or **(TMS)**:

1. Basis-of-Design Product: Subject to compliance with requirements, provide a comparable product by one of the following:
   a. Armstrong International "The Brain".
   b. Lawler Manufacturing Company, Inc.
   c. Leonard
   d. Powers

2. Standard: ASSE 1017, lead free.
3. Pressure Rating: 125 psig.
4. Type: Thermostatically controlled water mixing valve.
5. Material: Bronze body with corrosion-resistant interior components.
6. Connections: Threaded inlets and outlet.
7. Accessories Required: Manual temperature control, check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.
8. Valve Pressure Rating: 125 psig minimum, unless otherwise indicated.
9. Tempered-Water Setting: Refer to plans.
10. Tempered-Water Design Flow Rate: **20** gpm.
11. Valve Finish: Rough bronze.
12. Piping Finish: Copper.
13. Cabinet: Factory-fabricated, stainless steel, for surface mounting and with hinged, stainless-steel door.

2.4 STRAINERS FOR DOMESTIC WATER PIPING

A. Y-Pattern Strainers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. NIBCO INC. # T-221/222-A NPS 3 and smaller.
   b. NIBCO INC. # F-721-A, NPS 4 and larger.
   c. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
   d. Conbraco Industries, Inc.; Apollo Valves
   e. Pressure Rating: 200 psig CWP, unless otherwise indicated.

2. Body: Bronze for NPS 3 and smaller; Cast-Iron for NPS 4 and larger.
3. End Connections: Threaded for NPS 3 and smaller; flanged for NPS 4 and larger.
4. Screen: Stainless steel with round perforations, unless otherwise indicated.
5. Threads: ANSI B1.20.1.
6. Flange: ANSI B16.1.
7. Dezincification resistant.
8. Drain: Factory-installed.

2.5 WALL HYDRANTS

A. Non-freeze Wall Hydrants (**WH-1**):

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Woodford Manufacturing Company
   b. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   c. Watts Drainage Products Inc.

2. Standard: ASME A112.21.3M for concealed-outlet, self-draining wall hydrants.
3. Pressure Rating: 125 psig.
4. Supply Connections: NPS 1/2 or NPS 3/4 threaded inlet see plans.
5. Operation: Loose key.
6. Casing and Operating Rod: Of length required to match wall thickness. Include wall clamp.
7. Inlet: NPS 3/4.
8. Outlet: Concealed, with integral vacuum breaker and garden-hose thread complying with ASME B1.20.7.
9. Box: Deep, flush mounting with cover.
10. Box and Cover Finish: Polished nickel bronze.
11. Outlet: Exposed, with integral vacuum breaker and garden-hose thread complying with ASME B1.20.7.
12. Nozzle and Wall-Plate Finish: Polished nickel bronze.
13. Operating Keys(s): Two with each wall hydrant.

2.6 DRAIN VALVES

A. Ball-Valve-Type, Hose-End Drain Valves:

1. Standard: MSS SP-110 for standard-port, two-piece ball valves.
2. Pressure Rating: 400-psig minimum CWP.
3. Size: 1/2 inch for risers 1/2 inch through 1-1/2 inches, 1 inch for risers 2 inches and larger.
4. Body: Copper alloy.
5. Ball: Chrome-plated brass.
6. Seats and Seals: Replaceable.
7. Handle: Vinyl-covered steel.
8. Inlet: Threaded.
9. Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

B. Stop-and-Waste Drain Valves:

1. Standard: MSS SP-110 for ball valves.
2. Pressure Rating: 200-psig minimum CWP or Class 125.
3. Size: NPS 3/4.
4. Body: Copper alloy or ASTM B 62 bronze.
5. Drain: NPS 1/8 side outlet with cap.

2.7 WATER HAMMER ARRESTERS

A. Water Hammer Arresters (**WHA**):

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. JR Smith Mfg. Co.
   b. Sioux Chief Manufacturing Company, Inc.
   c. PPP Inc.
   d. Watts Drainage Products Inc.

2. Basis of Design: JR Smith Figure #5201-5250 lead-free.

3. Standard: ASSE 1010 or PDI-WH 201.
4. Type: Piston type
5. Size: ASSE 1010, Sizes AA and A through F or PDI-WH 201, Sizes A through F.

2.8 TRAP-SEAL PRIMER VALVES

A. Supply-Type, Trap-Seal Primer Valves (**TP**):

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Sioux Chief Manufacturing Company, Inc.
   b. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   c. Watts Industries, Inc.; Water Products Div.

2. Standard: ASSE 1018.
3. Pressure Rating: 125 psig minimum.
4. Body: Bronze.
5. Inlet and Outlet Connections: NPS 1/2 threaded or union joint.
6. Gravity Drain Outlet Connection: NPS 1/2 threaded joint.
7. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.
8. Under slab outlet piping from primer valve to drain shall be insulated using 1/2 inch armaflex type insulation.
9.

2.12 DOMESTIC HOT WATER CIRCULATING PUMP **(DCP)**:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Grundfos Pumps Corp.
   b. TACO Incorporated.

c. Bell & Gossett Domestic Pump; ITT Corporation.

2. Description: Factory assembled and tested, in-line, close-coupled, stainless steel pump housing, canned rotor type, corrosion-resistant impeller.
3. Electrical: 115V, single phase, 60Hz.
4. Sequence of Operation: Plumbing contractor shall provide all time and materials to provide fully functional controls for hot water circulation system as listed below:

a. Occupied Mode:

1) 7-day programmable timer shall be set to the "ON" position enabling circulation pump DCP-1 & DCP-2 when corresponding aquastat signals for pump to cycle on/off.
2) DCP-1 shall cycle on when water temperature drops below 95°F (adjustable) as sensed by pipe mounted aquastat and cycle off when water temperature rises above 105°F (adjustable) as sensed by same aquastat.
3) DCP-2 shall cycle on when water temperature drops below 130°F (adjustable) as sensed by storage tank mounted aquastat and cycle off when water temperature rises above 140°F as sensed by same aquastat.

b. Unoccupied Mode:

1) 7-day programmable timer shall be set to the "OFF" position disabling corresponding circulating pump DCP-1 & DCP-2.

5.

2.13

2.14 EXPANSION TANK **(ET-1)**:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Amtrol
b. Armstrong Pumps, Inc.
c. TACO, Inc.

2. Description: Pre-charged hydro-pneumatic steel expansion tank. Constructed in accordance with Section VIII, Division 1 of the ASME Boiler and Pressure Vessel Code, all welds conforming to ASME Section IX.

2.15 OUTLET BOXES

B. Icemaker Outlet Boxes **(OB-1)**

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Acorn Engineering Company.
b. IPS Corporation.
c. Oatey.
d. Sioux Chief.

2. Basis of Design: Oatey #39140 with arrester.
3. Mounting: Recessed.
4. Material and Finish: Powder coated box and faceplate mount at 60 inches AFF to centerline unless noted otherwise on plans.
5. Supply Shutoff Fitting: NPS 1/4 ball valve and NPS 1/4 copper supply water tubing. **Note:** Neatly coil 8 ft of tubing to allow equipment access/removal. Plastic piping will not be allowed.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Refer to Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.

B. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with authorities having jurisdiction.

1. Locate backflow preventers in same room as connected equipment or system.
2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe to floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are not acceptable for this application.
3. **Do not** install bypass piping around backflow preventers.

C. Install balancing valves in locations where they can easily be adjusted.

D. Install Y-pattern strainers for water on supply side of each device where indicated on the Drawings.

E. Install draining-type post hydrants if/where indicated on plans. Connect, extend and terminate 1/4 inch drain as indicated on the Drawings.

F. Install water hammer arresters in water piping according to PDI-WH 201.

G. Install manual air vents at high points of water piping.

H. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping and specialties.

B. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

C. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.3 LABELING AND IDENTIFYING

A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:

1. Reduced-pressure-principle backflow preventers.
2. Calibrated balancing valves.
3. Thermostatic, water mixing valves.
4. Supply-type, trap-seal primer valves.

B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

3.4 FIELD QUALITY CONTROL

A. Perform the following tests and prepare test reports:

1. Test each according to authorities having jurisdiction and the device's reference standard.

B. Remove and replace malfunctioning domestic water piping specialties and retest as specified above.

3.5 ADJUSTING

A. Set field-adjustable pressure set points of water pressure-reducing valves.

B. Set field-adjustable flow set points of balancing valves.

C. Set field-adjustable temperature set points of temperature-actuated water mixing valves.

END OF SECTION 22 1119