SECTION 221119
DOMESTIC WATER PIPING SPECIALTIES

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes the following domestic water piping specialties:
   1. Vacuum breakers
   2. Backflow preventers
   3. Balancing valves
   4. Strainers
   5. Hose bibbs
   6. Drain valves
   7. Thermostatic Mixing Valves
   8. Wall Hydrants
   9. Water Hammer Arrestors
   10. Dielectric Unions
   11. Flexible connectors.

B. Related Sections include the following:
   1. Division 22 Section "Meters and Gages for Plumbing Piping" for thermometers, pressure gages, and flow meters in domestic water piping.
   2. Division 22 Section "Domestic Water Piping" for water meters.

1.02 PERFORMANCE REQUIREMENTS

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

1.03 SUBMITTALS

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

B. Field quality-control test reports.

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

1.04 QUALITY ASSURANCE

A. NSF Compliance:
   1. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9."

PART 2 PRODUCTS

2.01 VACUUM BREAKERS

A. Pipe-Applied, Atmospheric-Type Vacuum Breakers:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Ames Co.
      b. Cash Acme.
      c. Conbraco Industries, Inc.
      d. FEBCO; SPX Valves & Controls.
      e. Keckley.
      f. Watts Industries, Inc.; Water Products Div.
      g. Zurn Plumbing Products Group; Wilkins Div.
   2. Standard: ASSE 1001.
   3. Size: NPS 1/4 to NPS 3, as required to match connected piping.
   4. Body: Bronze.
   5. Inlet and Outlet Connections: Threaded.
   6. Finish: Rough bronze.

2.02 BACKFLOW PREVENTERS

A. Reduced-Pressure-Principle Backflow Preventers, RPZ:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Watts Industries, Inc.; Water Products Div.
      b. Zurn Plumbing Products Group; Wilkins Div.
   2. Standard: ASSE 1013.
   3. Operation: Continuous-pressure applications.
   4. Pressure Loss: 8 psig maximum, through middle 1/3 of flow range.
   5. Size: As shown on the drawings.
   6. Body: Bronze for NPS 2 and smaller; steel with interior lining complying with AWWA C550 or that is FDA approved for NPS 2-1/2 and larger.
   7. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
   8. Configuration: Designed for horizontal, straight through flow.
   9. Accessories:
      a. Valves: Ball type with threaded ends on inlet and outlet ofNPS 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.

2.03 BALANCING VALVES

A. Self-Actuating Thermostatic Recirculation Balancing Valve
   1. Manufacturer: Circuit Solver as Manufactured by ThermOmega Tech., Model CSUA.
   2. Description: Self Contained, Self-Actuating Thermostatic, flow control valve for maintaining dynamic control of domestic water recirculation system temperature.
   3. Stainless Steel Construction: Body and All Internal Components
   4. Temp Setpoint: Adjustable between 105 & 140 °F
   5. Initial Setpoint: 110°F
   6. Working Pressure: 200 PSIG Max
   7. Thermal Actuator: Spring operated and self-cleaning, delivering closing thrust sufficient to keep orifice opening free of scale deposits.
   8. Include ball isolation valves at each end.

B. Copper-Alloy Calibrated Balancing Valves:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Armstrong International, Inc.
      b. Flo Fab Inc.
      c. ITT Industries; Bell& Gossett Div.
      d. NIBCO INC.
      e. Taco, Inc.
      f. Victaulic/Tour & Andersson Series 786 or 787.
      g. Watts Industries, Inc.; Water Products Div.
   2. Type: Ball or Y-pattern globe valve with two readout ports and memory setting indicator.
   3. Body: Brass or bronze,
   4. Size: Same as connected piping, but not larger than NPS 2 (DN 50).
   5. Accessories: Meter hoses, fittings, valves, differential pressure meter, and carrying case.

C. Ductile-Iron Calibrated Balancing Valves:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Victaulic/Tour & Andersson Series 788 or 789.
   2. Type: Y-pattern globe valve with two readout ports and concealed memory setting indicator with locking, tamper-proof setting.
   3. Body: Ametal® brass or bronze,
   4. Size: Same as connected piping, NPS 2-1/2 (DN 50) to NPS 12 (DN 300).

5. Accessories: Meter hoses, fittings, valves, differential pressure meter, and carrying case.

D. Accessories: Meter hoses, fittings, valves, differential pressure meter, and carrying case.

2.04 STRAINERS FOR DOMESTIC WATER PIPING

A. Y-Pattern Strainers:
1. Pressure Rating: 125 psig minimum, unless otherwise indicated.
2. Body: Bronze for NPS 2 and smaller; cast iron with interior lining complying with AWWA C550 or FDA-approved, epoxy coating and for NPS 2-1/2 and larger.
3. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
4. Screen: Stainless steel with round perforations, unless otherwise indicated.
5. Perforation Size:
   a. Strainers NPS 2 and Smaller: 0.033 inch.
   b. Strainers NPS 2-1/2 to NPS 4: 0.045 inch.
   c. Strainers NPS 5 and Larger: 0.10 inch.
6. Drain: Factory-installed, hose-end drain valve.

2.05 HOSE BIBBS

A. Hose Bibbs, HB:
1. Standard: ASME A112.18.1 for sediment faucets.
2. Body Material: Bronze.
3. Seat: Bronze, replaceable.
4. Supply Connections: NPS 1/2 or NPS 3/4 threaded or solder-joint inlet.
5. Outlet Connection: Garden-hose thread complying with ASME B1.20.7.
6. Pressure Rating: 125 psig.
7. Vacuum Breaker: Integral non-removable, drainable, hose-connection vacuum breaker complying with ASSE 1011.
8. Finish for Equipment Rooms: Rough bronze, or chrome or nickel plated.
9. Finish for Service Areas: Rough bronze.
10. Finish for Finished Rooms: Chrome or nickel plated.
11. Operation for Equipment Rooms: Wheel handle or operating key.
12. Operation for Service Areas: Wheel handle.

2.06 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: NPS 3/4.
4. Body: Copper alloy.
5. Ball: Chrome-plated brass.
6. Seats and Seals: Replaceable.
7. Handle: Vinyl-covered steel.
8. Inlet: Threaded or solder joint.
9. Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

2.07 THERMOSTATIC MIXING VALVES

A. Individual-Fixture / Point-of-Use, Thermostatic Mixing (Anti-Scald) Valves:
1. Standard: ASSE 1070, thermostatically controlled, water tempering valve.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Leonard Valve Company.
   b. Lawler.
   c. Powers; a Watts Industries Co.
   d. Watts.
3. BATHTUB/WHIRLPOOL Temp Limiting/Mixing Valves:
   a. Basis of Design Bathtub/Whirlpool Valve: MMV-WP

b. Pressure Rating: 125 psig (860 kPa) minimum unless otherwise indicated.
c. Body: Brass or bronze body with corrosion-resistant interior components; lead free.
d. Integral check valves and screens.
e. Temperature Control: Adjustable.
f. Inlets and Outlet: 3/8” Threaded
g. Finish: Rough Bronze
h. Temp Setting: 120°F

4. LAVATORY/SINK Temp Limiting/Mixing Valves:
a. Basis of Design Bathtub/Whirlpool Valve: MMV-WP
b. Pressure Rating: 125 psig (860 kPa) minimum unless otherwise indicated.
c. Body: Brass or bronze body with corrosion-resistant interior components; lead free.
d. Integral check valves and screens.
e. Temperature Control: Adjustable.
f. Inlets and Outlet:1/2” Threaded
g. Finish: Chrome-plated bronze where exposed, Rough Bronze where concealed
h. Temp Setting: 110°F

B. Master Controlled-Fixture, Water Tempering Valves, (MV):
1. Manufacturers: Subject to compliance with requirements, provide one of the following:
a. Leonard Valve Company.
b. Lawler.
c. Powers; a Watts Industries Co.
d. Symmons Industries, Inc.
e. Watts.
2. Standard: ASSE 1070, thermostatically controlled, water tempering valve.
3. Pressure Rating: 125 psig (860 kPa) minimum unless otherwise indicated.
4. Body: Brass or bronze body with corrosion-resistant interior components; lead free.
5. Integral check valves and screens.
6. Temperature Control: Adjustable.
7. Inlets and Outlet: Threaded.
8. Finish: Rough bronze.
9. Tempered-Water Setting: 80 deg F.
10. Size and quantity: Based on specific valve maximum GPM and the number of fixtures connected to common line.

2.08 WALL HYDRANTS

A. Non-freeze Wall Hydrants, WH:
1. Standard: ASSE 1019 for non-freeze exposed outlet, self-draining wall hydrants.
2. Pressure Rating: 125 psig (860 kPa).
3. Operation: Loose key.
4. Casing and Operating Rod: Of length required to match wall thickness. Include wall clamp.
5. Inlet: NPS 3/4 or NPS 1 (DN 20 or DN 25).
6. Outlet: Concealed, with integral vacuum breaker and garden-hose thread complying with ASSE 1052.
7. Box: Deep, flush mounted with cover.
8. Box and Cover Finish: Chrome Plated
9. Outlet: Exposed, with integral vacuum breaker and garden-hose thread complying with ASME B1.20.7.
10. Nozzle and Wall-Plate Finish: Polished nickel bronze.
11. Operating Keys(s): Two with each wall hydrant.

2.09 WATER-HAMMER ARRESTERS

A. Water-Hammer Arresters WHA
1. Standard: ASSE 1010 or PDI-WH 201.
2. Type: Copper Tube with Piston
3. Size: ASSE 1010, Sizes AA and A through F, or PDI-WH 201, Sizes A through F.

2.10 DIELECTRIC UNIONS

A. For Connecting Dissimilar Metallic Piping Systems
   1. For pipe sizes 2 inches and smaller: Dielectric union with screwed connections, steel body with insulating gasket and copper connections
   2. For pipe sizes 2-1/2 inches and larger: Dielectric union with flanged connections, cast iron body with insulating gasket and copper connections, pressure rated for intended service.

2.11 FLEXIBLE CONNECTORS

A. Bronze-Hose Flexible Connectors: Corrugated-bronze tubing with bronze wire-braid covering and ends brazed to inner tubing.
   1. Working-Pressure Rating: Minimum 200 psig.
   2. End Connections NPS 2 (DN 50) and Smaller: Threaded copper pipe or plain-end copper tube.
   3. End Connections NPS 2-1/2 (DN 65) and Larger: Flanged copper alloy.

B. Stainless-Steel-Hose Flexible Connectors: Corrugated-stainless-steel tubing with stainless-steel wire-braid covering and ends welded to inner tubing.
   1. Working-Pressure Rating: Minimum 200 psig
   2. End Connections NPS 2 (DN 50) and Smaller: Threaded steel-pipe nipple.
   3. End Connections NPS 2-1/2 (DN 65) and Larger: Flanged steel nipple.

PART 3 EXECUTION

3.01 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 Automatic Circuit Solver Type Self-Actuating Thermostatic Recirculation Balancing Valve on Domestic Hot Water Recirculation Piping Where Balancing Valves are Indicated. Provide line-size Isolation Valves up and downstream of these devices for servicing unless included with the valve.

D. Install water hammer arresters in horizontal lines serving multiple fixtures with quick-closing valves, whether or not shown on the drawings. Install in accordance with The IAPMO Uniform Plumbing Code.

E. Install Individual-Fixture / Point-of-Use, Thermostatic Mixing (Anti-Scald) Valves at all new and existing lavatories and sinks in area of work or outside of work areas but served by the same service water heating plant/equipment.
   1. Temp Limiting Setting: 110 deg F.

F. Install Individual-Fixture / Point-of-Use, Thermostatic Mixing (Anti-Scald) Valves at all new bathtubs, soak tubs, whirlpools, etc. Coordinate accessible location for servicing and replacement or coordinate and provide access panels in ceiling of floor below.
   1. Temp Limiting Setting: 120 deg F.

3.02 CONNECTIONS

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

3.03 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.

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."

3.04 FIELD QUALITY CONTROL

A. Perform the following tests and prepare test reports:
   1. Test each reduced-pressure-principle backflow preventer 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.

END OF SECTION 221119

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