SECTION 221119 - DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following domestic water piping specialties:
   1. Backflow preventers.
   2. Water pressure-reducing valves.
   4. Temperature-actuated water mixing valves.
   5. Strainers.
   6. Hose bibbs.
   7. Wall hydrants.
   8. Drain valves.

1.2 PERFORMANCE REQUIREMENTS

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

1.3 SUBMITTALS

A. Product Data: For each product indicated, include rated capacities, materials, finishes, dimensions, required clearances, methods of assembly of components, and piping and wiring connections.

B. Operation and maintenance data for the following:
   1. Backflow preventers.
   2. Water pressure-reducing valves.
   3. Temperature-actuated water mixing valves.

1.4 QUALITY ASSURANCE

A. Plumbing specialties shall bear label, stamp, or other markings of specified testing agency.

B. 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.


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

PART 2 - PRODUCTS

2.1 BACKFLOW PREVENTERS

A. Reduced-Pressure-Principle Backflow Preventers suitable for continuous pressure application, consisting of two positive-seating check valves with intermediate relief valve, and test locks:

3. Operation: Continuous-pressure applications.
4. Pressure Loss: 7 psig maximum, through middle 1/3 of flow range.
5. Pressure Loss at Design Flow Rate: 7 psig.
6. Body: Bronze for NPS 2 and smaller; cast iron or steel with interior lining complying with AWWA C550 or that is FDA approved, or stainless steel 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, or vertical inlet, horizontal center section, and vertical outlet flow as indicated.
9. Accessories:
   a. Valves: Ball type with threaded ends on inlet and outlet of NPS 4 and smaller; outside screw and yoke gate-type with flanged ends on inlet and outlet of NPS 6 and larger.

B. Double-Check Backflow-Prevention Assemblies:

1. Manufacturers: Provide Wilkins Model 350A.
3. Operation: Continuous-pressure applications, unless otherwise indicated.
4. Pressure Loss: 7 psig maximum, through middle 1/3 of flow range.
5. Pressure Loss at Design Flow Rate: 7 psig.
6. Body: Ductile iron
7. End Connections: Flanged
8. Configuration: Designed for horizontal, straight through flow.
9. Accessories:
   a. Valves: Outside screw and yoke gate-type with flanged ends on inlet and outlet of.

2.2 WATER PRESSURE-REDUCING VALVES

A. Water Regulators:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
b. Zurn Plumbing Products Group; Wilkins Div.

4. Body: Bronze for NPS 2 and smaller; cast iron with interior lining complying with AWWA C550 or that is FDA approved for NPS 2-1/2 and NPS 3.
5. Type: Single-seated, direct operated, unless otherwise indicated for NPS 2 and smaller. Pilot-operated, diaphragm controlled, single- or double-seated, cast-iron-body main valve, with bronze-body pilot valve for valves NPS 2-1/2 and larger where indicated.
8. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and NPS 3.

2.3 BALANCING VALVES

A. Bronze, Calibrated-Orifice, Balancing Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Armstrong Fluid Technology
   b. Bell & Gossett
   c. Griswold Controls.
2. Body: Bronze, ball type with calibrated orifice or venture.
3. Ball: Brass or stainless steel.
4. Seat: PTFE.
5. End Connections: Threaded or socket.
7. Handle Style: Lever, with memory stop to retain set position.
8. CWP Rating: Minimum 125 psig.
9. Maximum Operating Temperature: 250 deg F.

2.4 TEMPERATURE-ACTUATED WATER MIXING VALVES

A. Primary, Thermostatic, Water Mixing Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Bradley.
   b. Lawler Manufacturing Company, Inc.
   c. Leonard Valve Company.
   d. Watts Industries Co.
   e. Symmons Industries, Inc.
4. Type: Exposed-mounting or Cabinet-type, thermostatically-controlled, pressure-balanced, water mixing valve.
5. Material: Bronze body with corrosion-resistant interior components.
6. Connections: Threaded union inlets and outlet.
7. Accessories: Manual temperature control, check stops on hot- and cold-water supplies, outlet thermometer, and adjustable, temperature-control handle.
8. Valve Pressure Rating: 125 psig minimum, unless otherwise indicated.
10. Valve Finish: Rough bronze.
11. Piping Finish: Copper.
12. Cabinet: Factory-fabricated, stainless steel, for recessed or surface mounting and with hinged, stainless-steel door.

2.5 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. Screwed screen retainer and centered blowdown.
   3. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
   4. Screen: ASTM A 666 Type 304 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.

2.6 OUTLeT BoXES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Acorn Engineering Company.
   2. Guy Gray Manufacturing Co., Inc.
   4. Zurn Industries, Inc.

B. General: Recessed-mounting outlet boxes with supply fittings complying with ASME A112.18.1M. Include box with faceplate, services indicated for equipment connections, and steel-blocking reinforcement.

C. Clothes Washer Outlet Boxes: With hot- and cold-water hose connections, drain, and the following:
   1. Box and Faceplate: Plastic.
   2. Shutoff Fitting(s): Combination, single lever, or two quarter-turn ball valves with hose end connections.
   3. Drain: NPS 2 standpipe, P-trap, and direct waste connection to drainage piping.

D. Icemaker and Coffee Machine Outlet Boxes: With hose connection and the following:
   1. Box and Faceplate: Plastic.
2. Shutoff Fitting: Stop with compression end sized to match the equipment connection.

2.7 HOSE BIBBS

A. Non-freeze Wall Hydrants:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Woodford Manufacturing Company model B65 or comparable product by one of the following:
   a. Acorn Products, Inc.
   b. Watts Industries, Inc.
   c. Zurn Industries, Inc.

2. Standard: ASSE 1019.B for concealed-outlet, self-draining wall hydrants and listed by IAPMO.
4. Operation: Loose key.
5. Casing and Operating Rod: Copper tube casing with stainless steel operating stem of length required to match wall thickness. Include wall clamp.
7. Outlet: Concealed, with integral vacuum breaker complying with ASSE 1011, and garden-hose thread complying with ASME B1.20.7.
8. Box: Brass or Anodized aluminum deep, flush mounting with tee-handle operated locking cover.
10. Operating Keys(s): One with each wall hydrant.

B. Wall Hydrants:

1. Basis-of-Design Product: Subject to compliance with requirements provide Woodford Manufacturing Company model B76 or comparable product by one of the following:
   a. Acorn Products, Inc.
   b. Watts Industries, Inc.
   c. Zurn Industries, Inc.

2. Standard: ASSE 1052 for concealed-outlet, self-draining wall hydrants and listed by IAPMO.
4. Operation: Loose key.
6. Outlet: Concealed, with non-removable hose-connection backflow preventer complying with ASSE 1052; and garden-hose thread complying with ASME B1.20.7.
7. Box: Brass, deep, flush mounting with tee-handle operated locking cover.
8. Box and Cover Finish: Chrome plated.
9. Operating Keys(s): One with each wall hydrant.

C. Wall Faucets:

1. Basis-of-Design Product: Subject to compliance with requirements provide Woodford Manufacturing Company model 24 or a comparable product by one of the following:
   a. Acorn Products, Inc.
   b. Watts Industries, Inc.
8. Vacuum Breaker: Integral or field-installed, non-removable, drainable, hose-connection vacuum breaker complying with ASSE 1011 and listed by IAPMO; with garden hose threads complying with ASME B1.20.7 on outlet.
9. Finish for Equipment Rooms: Rough bronze, or chrome or nickel plated.
10. Finish for Service Areas: Chrome or nickel plated.
11. Operation for Equipment Rooms: Metal wheel handle or operating key.
12. Operation for Service Areas: Operating key.
13. Include operating key with each operating-key hose bibb.
14. Include integral wall flange with each chrome- or nickel-plated hose bibb.

2.8 DRAIN VALVES

A. Ball-Valve-Type, Hose-End Drain Valves:
2. Pressure Rating: 400-psig minimum CWP.
4. Body: Copper alloy.
5. Ball: Chrome-plated brass.
7. Seats and Seals: Replaceable.
9. Inlet: Threaded or solder joint.
10. Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

B. Ball-Valve-Type, Stop-and-Waste Drain Valves.
1. Standard: MSS SP-110 for full-port, two-piece ball valves.
2. Pressure Rating: 400-psig minimum CWP.
3. Body: Copper alloy.
4. Ball: Chrome-plated brass.
5. Stem: Blowout-proof.
8. Inlet: Threaded or solder-joint.
9. Outlet: Threaded or solder-joint.

2.9 WATER HAMMER ARRESTERS

A. Water Hammer Arresters:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
c. Tyler Pipe; Wade Div.  
d. Watts Drainage Products Inc.  
e. Zurn Plumbing Products Group

3. Type: Metal bellows.
4. Size: ASSE 1010, Sizes AA and A through F or PDI-WH 201, Sizes A through F.

2.10 TRAP-SEAL DEVICES

A. Trap-Seed Device:

1. Manufacturers: Provide the SureSeal by Rectorseal.
3. Body: ABS.
4. Diaphragm: EPDM.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All equipment and components shall be installed in accordance with their listing and manufacturer’s published installation instructions.

B. Refer to Section 220515 "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.

C. 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 where indicated.
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 sink. 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.

D. Install water regulators with inlet and outlet shutoff valves and bypass with memory-stop balancing valve. Install pressure gages on inlet and outlet.

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

F. Install temperature-actuated water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.

1. Install thermometers and water regulators if specified.
2. Install cabinet-type units recessed in or surface mounted on wall as specified.
G. Install Y-pattern strainers for water on supply side of each control valve, water pressure-
reducing valve, solenoid valve, potable water backflow prevention assembly, and pump.

H. Install hose bibs where indicated on drawings per the following.
   2. Public Interior Locations: Wall hydrants.

I. Install water hammer arresters with shutoff valves in water piping according to PDI-WH 201 by
   the Plumbing & Drainage Institute.

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

K. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or
   sign on or near each of the following:
   1. Primary, thermostatic, water mixing valves.

L. 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 Section 220553 “Identification for
   Plumbing Piping and Equipment.”

3.2 FIELD QUALITY CONTROL

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

3.3 ADJUSTING

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

B. Set field-adjustable flow of balancing valves.

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

END OF SECTION