

SECTION 15145 - DOMESTIC WATER PIPING SPECIALTIES

Project Number 14-5006-39

Project Title Kansas City Area Transportation Authority
Service Line Reversal (FOR INFORMATION ONLY)

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. Section Includes:

1. Vacuum breakers.
2. Backflow preventers.
3. Water pressure-reducing valves.
4. Balancing valves.
5. Temperature-actuated, water mixing valves.
6. Strainers.
7. Hose stations.
8. Hose bibbs.
9. Drain valves.
10. Water-hammer arresters.
11. Trap-seal primer valves.
12. Trap-seal primer systems.
13. Specialty valves.
14. Flexible connectors.
15. Water meters.

B. Related Requirements:

1. Section 15126 "Meters and Gages for Plumbing Piping" for thermometers, pressure gages, and flow meters in domestic water piping.
2. Section 15140 "Domestic Water Piping" for water meters.

1.3 ACTION SUBMITTALS

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

- B. Shop Drawings: For domestic water piping specialties.
 - 1. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

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

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

- A. Potable-water piping and components shall comply with NSF 61 and NSF 14. Mark "NSF-pw" on plastic piping components.

2.2 PERFORMANCE REQUIREMENTS

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

2.3 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 Fire & Waterworks; a division of Watts Water Technologies, Inc.](#)
 - b. [Cash Acme; a division of Reliance Worldwide Corporation.](#)
 - c. [Conbraco Industries, Inc.](#)
 - d. [FEBCO; a division of Watts Water Technologies, Inc.](#)
 - e. [Rain Bird Corporation.](#)
 - f. [Toro Company \(The\); Irrigation Div.](#)
 - g. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)
 - h. [Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.](#)
 - 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.

B. Hose-Connection Vacuum Breakers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Arrowhead Brass Products.](#)
 - b. [Cash Acme; a division of Reliance Worldwide Corporation.](#)
 - c. [Conbraco Industries, Inc.](#)
 - d. [Legend Valve.](#)
 - e. [MIFAB, Inc.](#)
 - f. [Prier Products, Inc.](#)
 - g. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)
 - h. [Woodford Manufacturing Company; a division of WCM Industries, Inc.](#)
 - i. [Zurn Industries, LLC; Plumbing Products Group; Light Commercial Products.](#)
 - j. [Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.](#)
2. Standard: ASSE 1011.
3. Body: Bronze, nonremovable, with manual drain.
4. Outlet Connection: Garden-hose threaded complying with ASME B1.20.7.
5. Finish: Rough bronze.

C. Pressure Vacuum Breakers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Ames Fire & Waterworks; a division of Watts Water Technologies, Inc.](#)
 - b. [Conbraco Industries, Inc.](#)
 - c. [FEBCO; a division of Watts Water Technologies, Inc.](#)
 - d. [Flomatic Corporation.](#)
 - e. [Toro Company \(The\); Irrigation Div.](#)
 - f. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)
 - g. [Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.](#)
2. Standard: ASSE 1020.
3. Operation: Continuous-pressure applications.
4. Pressure Loss: 5 psig maximum, through middle third of flow range.
5. Size: As indicated on Drawings.
6. Selected Unit Flow Range Limits: As scheduled.
7. Pressure Loss at Design Flow Rate: As scheduled.
8. Accessories:
 - a. Valves: Ball type, on inlet and outlet.

D. Laboratory-Faucet Vacuum Breakers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Conbraco Industries, Inc.](#)
 - b. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)
 - c. [Woodford Manufacturing Company; a division of WCM Industries, Inc.](#)
 - d. [Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.](#)
2. Standard: ASSE 1035.
3. Size: NPS 1/4 or NPS 3/8 matching faucet size.
4. Body: Bronze.
5. End Connections: Threaded.
6. Finish: Chrome plated.

E. Spill-Resistant Vacuum Breakers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Conbraco Industries, Inc.](#)
 - b. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)
2. Standard: ASSE 1056.
3. Operation: Continuous-pressure applications.
4. Size: As indicated on Drawings.
5. Accessories:
 - a. Valves: Ball type, on inlet and outlet.

2.4 BACKFLOW PREVENTERS

A. Intermediate Atmospheric-Vent Backflow Preventers:

1. Manufacturers: Subject to compliance with requirements:
 - a. [Cash Acme; a division of Reliance Worldwide Corporation.](#)
 - b. [Conbraco Industries, Inc.](#)
 - c. [FEBCO; a division of Watts Water Technologies, Inc.](#)
 - d. [Honeywell International Inc.](#)
 - e. [Legend Valve.](#)
 - f. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)
 - g. [Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.](#)

2. Standard: ASSE 1012.
3. Operation: Continuous-pressure applications.
4. Size: As scheduled.
5. Body: As scheduled.
6. End Connections: As scheduled.
7. Finish: As scheduled.

B. Double-Check, Backflow-Prevention Assemblies:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Ames Fire & Waterworks; a division of Watts Water Technologies, Inc.](#)
 - b. [Conbraco Industries, Inc.](#)
 - c. [FEBCO; a division of Watts Water Technologies, Inc.](#)
 - d. [Flomatic Corporation.](#)
 - e. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)
 - f. [Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.](#)
2. Standard: ASSE 1015.
3. Operation: Continuous-pressure applications unless otherwise indicated.
4. Pressure Loss: 5 psig maximum, through middle third of flow range.
5. Size: As scheduled.
6. Design Flow Rate: As scheduled.
7. Selected Unit Flow Range Limits: As scheduled.
8. Pressure Loss at Design Flow Rate: As scheduled.
9. Body: Bronze for NPS 2 and smaller; cast iron with interior lining that complies with AWWA C550 or that is FDA approved for NPS 2-1/2 and larger.
10. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
11. Configuration: Designed for horizontal, straight-through flow.
12. Accessories:
 - a. Valves NPS 2 and Smaller: Ball type with threaded ends on inlet and outlet.
 - b. Valves NPS 2-1/2 and Larger: Outside-screw and yoke-gate type with flanged ends on inlet and outlet.

C. Dual-Check-Valve Backflow Preventers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Cash Acme; a division of Reliance Worldwide Corporation.](#)
 - b. [Conbraco Industries, Inc.](#)
 - c. [FEBCO; a division of Watts Water Technologies, Inc.](#)
 - d. [Flomatic Corporation.](#)
 - e. [Ford Meter Box Company, Inc. \(The\).](#)
 - f. [Honeywell International Inc.](#)
 - g. [Legend Valve.](#)

- h. [McDonald, A. Y. Mfg. Co.](#)
 - i. [Mueller Co. Ltd.; a subsidiary of Mueller Water Products Inc.](#)
 - j. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)
 - k. [Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.](#)
 - 2. Standard: ASSE 1024.
 - 3. Operation: Continuous-pressure applications.
 - 4. Size: As scheduled.
 - 5. Body: Bronze with union inlet.
- D. Double-Check, Detector-Assembly Backflow Preventers:
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Ames Fire & Waterworks; a division of Watts Water Technologies, Inc.](#)
 - b. [Conbraco Industries, Inc.](#)
 - c. [FEBCO; a division of Watts Water Technologies, Inc.](#)
 - d. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)
 - e. [Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.](#)
 - 2. Standard: ASSE 1048 and is FM Global approved or UL listed.
 - 3. Operation: Continuous-pressure applications.
 - 4. Pressure Loss: As scheduled.
 - 5. Size: As scheduled.
 - 6. Design Flow Rate: As scheduled.
 - 7. Selected Unit Flow Range Limits: As scheduled.
 - 8. Pressure Loss at Design Flow Rate: As scheduled.
 - 9. Body: Cast iron with interior lining that complies with AWWA C550 or that is FDA approved.
 - 10. End Connections: Flanged.
 - 11. Configuration: As scheduled.
 - 12. Accessories:
 - a. Valves: Outside-screw and yoke-gate type with flanged ends on inlet and outlet.
 - b. Bypass: With displacement-type water meter, shutoff valves, and reduced-pressure backflow preventer.
- E. Hose-Connection Backflow Preventers:
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Conbraco Industries, Inc.](#)
 - b. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)

- c. Woodford Manufacturing Company; a division of WCM Industries, Inc.
 - 2. Standard: ASSE 1052.
 - 3. Operation: Up to 10-foot head of water back pressure.
 - 4. Inlet Size: NPS 1/2 or NPS 3/4.
 - 5. Outlet Size: Garden-hose thread complying with ASME B1.20.7.
 - 6. Capacity: At least 3-gpm flow.
- F. Backflow-Preventer Test Kits:
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Conbraco Industries, Inc.
 - b. FEBCO; a division of Watts Water Technologies, Inc.
 - c. Flomatic Corporation.
 - d. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.
 - e. Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.
 - 2. Description: Factory calibrated, with gages, fittings, hoses, and carrying case with test-procedure instructions.

2.5 WATER PRESSURE-REDUCING VALVES

- A. Water Regulators:
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cash Acme; a division of Reliance Worldwide Corporation.
 - b. Conbraco Industries, Inc.
 - c. Honeywell International Inc.
 - d. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.
 - e. Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.
 - 2. Standard: ASSE 1003.
 - 3. Pressure Rating: Initial working pressure of 150 psig.
 - 4. Size: As scheduled.
 - 5. Design Flow Rate: As scheduled.
 - 6. Design Inlet Pressure: As scheduled.
 - 7. Design Outlet Pressure Setting: As scheduled.
 - 8. Body: As scheduled.
 - 9. Valves for Booster Heater Water Supply: Include integral bypass.
 - 10. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and NPS 3.

B. Water-Control Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [CLA-VAL.](#)
 - b. [Flomatic Corporation.](#)
 - c. [OCV Control Valves.](#)
 - d. [Watts; a division of Watts Water Technologies, Inc.; Control Valves \(Watts ACV\).](#)
 - e. [Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.](#)
2. Description: Pilot-operated, diaphragm-type, single-seated, main water-control valve.
3. Pressure Rating: Initial working pressure of 150 psig minimum with AWWA C550 or FDA-approved, interior epoxy coating. Include small pilot-control valve, restrictor device, specialty fittings, and sensor piping.
4. Main Valve Body: Cast- or ductile-iron body with AWWA C550 or FDA-approved, interior epoxy coating; or stainless-steel body.
 - a. Size: As scheduled.
 - b. Pattern: As scheduled.
 - c. Trim: Stainless steel.
5. Design Flow: As scheduled.
6. Design Inlet Pressure: As scheduled.
7. Design Outlet Pressure Setting: As scheduled.
8. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.

2.6 BALANCING VALVES

A. 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 Corporation; Bell & Gossett Div.](#)
 - d. [NIBCO Inc.](#)
 - e. [TAC.](#)
 - f. [TACO Incorporated.](#)
 - g. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)
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.
5. Accessories: Meter hoses, fittings, valves, differential pressure meter, and carrying case.

B. Cast-Iron 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 Corporation; Bell & Gossett Div.](#)
 - d. [NIBCO Inc.](#)
 - e. [TAC.](#)
 - f. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)
2. Type: Adjustable with Y-pattern globe valve, two readout ports, and memory-setting indicator.
3. Size: Same as connected piping, but not smaller than NPS 2-1/2.

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

D. Memory-Stop Balancing Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Conbraco Industries, Inc.](#)
 - b. [Crane Co.; Crane Valve Group; Crane Valves.](#)
 - c. [Crane Co.; Crane Valve Group; Jenkins Valves.](#)
 - d. [Crane Co.; Crane Valve Group; Stockham Div.](#)
 - e. [Hammond Valve.](#)
 - f. [Milwaukee Valve Company.](#)
 - g. [NIBCO Inc.](#)
 - h. [Red-White Valve Corp.](#)
2. Standard: MSS SP-110 for two-piece, copper-alloy ball valves.
3. Pressure Rating: 400-psig minimum CWP.
4. Size: NPS 2 or smaller.
5. Body: Copper alloy.
6. Port: Standard or full port.
7. Ball: Chrome-plated brass.
8. Seats and Seals: Replaceable.
9. End Connections: Solder joint or threaded.
10. Handle: Vinyl-covered steel with memory-setting device.

2.7 TEMPERATURE-ACTUATED, WATER MIXING VALVES

A. Water-Temperature Limiting Devices:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Armstrong International, Inc.](#)
 - b. [Cash Acme; a division of Reliance Worldwide Corporation.](#)
 - c. [Conbraco Industries, Inc.](#)
 - d. [Honeywell International Inc.](#)
 - e. [Legend Valve.](#)
 - f. [Leonard Valve Company.](#)
 - g. [Powers; a division of Watts Water Technologies, Inc.](#)
 - h. [Symmons Industries, Inc.](#)
 - i. [TACO Incorporated.](#)
 - j. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)
 - k. [Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.](#)
2. Standard: ASSE 1017.
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: Check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.
8. Tempered-Water Setting: As scheduled.
9. Tempered-Water Design Flow Rate: As scheduled.
10. Valve Finish: As scheduled.

B. Primary, Thermostatic, Water Mixing Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Armstrong International, Inc.](#)
 - b. [Lawler Manufacturing Company, Inc.](#)
 - c. [Leonard Valve Company.](#)
 - d. [Powers; a division of Watts Water Technologies, Inc.](#)
 - e. [Symmons Industries, Inc.](#)
2. Standard: ASSE 1017.
3. Pressure Rating: 125 psig minimum unless otherwise indicated.
4. Type: Exposed-mounted, thermostatically controlled, water mixing valve.
5. Material: Bronze body with corrosion-resistant interior components.
6. Connections: Threaded inlets and outlet.
7. Accessories: Manual temperature control, check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.
8. Tempered-Water Setting: As scheduled.

9. Tempered-Water Design Flow Rate: As scheduled.
10. Selected Valve Flow Rate at 45-psig Pressure Drop: As scheduled.
11. Pressure Drop at Design Flow Rate: As scheduled.
12. Valve Finish: As scheduled.
13. Piping Finish: As scheduled.

C. Manifold, Thermostatic, Water Mixing-Valve Assemblies:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Leonard Valve Company.](#)
 - b. [Powers; a division of Watts Water Technologies, Inc.](#)
 - c. [Symmons Industries, Inc.](#)
2. Description: Factory-fabricated, exposed-mounted, thermostatically controlled, water mixing-valve assembly in two-valve parallel arrangement.
3. Large-Flow Parallel: Thermostatic, water mixing valve and downstream-pressure regulator with pressure gages on inlet and outlet.
4. Intermediate-Flow Parallel: Thermostatic, water mixing valve and downstream-pressure regulator with pressure gages on inlet and outlet.
5. Small-Flow Parallel: Thermostatic, water mixing valve.
6. Thermostatic Mixing Valves: Comply with ASSE 1017. Include check stops on hot- and cold-water inlets and shutoff valve on outlet.
7. Water Regulator(s): Comply with ASSE 1003. Include pressure gage on inlet and outlet.
8. Pressure Rating: 125 psig minimum unless otherwise indicated.
9. Selected Large-Flow, Tempered-Water Valve Size: As scheduled.
10. Tempered-Water Setting: As scheduled.
11. Unit Tempered-Water Design Flow Rate: As scheduled.
12. Unit Minimum Tempered-Water Design Flow Rate: As scheduled.
13. Selected Unit Flow Rate at 45-psig Pressure Drop: As scheduled.
14. Unit Pressure Drop at Design Flow Rate: As scheduled.
15. Unit Tempered-Water Outlet Size: As scheduled end connection.
16. Unit Hot- and Cold-Water Inlet Size: As scheduled.
17. Thermostatic Mixing Valve and Water Regulator Finish: As scheduled.
18. Piping Finish: As scheduled.

D. Individual-Fixture, Water Tempering Valves

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Cash Acme; a division of Reliance Worldwide Corporation.](#)
 - b. [Conbraco Industries, Inc.](#)
 - c. [Honeywell International Inc.](#)
 - d. [Lawler Manufacturing Company, Inc.](#)
 - e. [Leonard Valve Company.](#)
 - f. [Powers; a division of Watts Water Technologies, Inc.](#)
 - g. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)

h. Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.

2. Standard: ASSE 1016, thermostatically controlled, water tempering valve.
3. Pressure Rating: 125 psig minimum unless otherwise indicated.
4. Body: Bronze body with corrosion-resistant interior components.
5. Temperature Control: Adjustable.
6. Inlets and Outlet: As scheduled.
7. Finish: As scheduled.
8. Tempered-Water Setting: As scheduled.
9. Tempered-Water Design Flow Rate: As scheduled.

E. Primary Water Tempering Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Heat-Timer Corporation.
 - b. Holby Valve Co., Inc.
2. Standard: ASSE 1017, thermostatically controlled, water tempering valve, listed as tempering valve.
3. Pressure Rating: 125 psig minimum unless otherwise indicated.
4. Body: Bronze.
5. Temperature Control: Manual.
6. Inlets and Outlet: As scheduled.
7. Selected Primary Water Tempering Valve Size: As scheduled.
8. Tempered-Water Setting: As scheduled.
9. Tempered-Water Design Flow Rate: As scheduled.
10. Pressure Drop at Design Flow Rate: As scheduled.
11. Tempered-Water Outlet Size: As scheduled.
12. Cold-Water Inlet Size: As scheduled.
13. Hot-Water Inlet Size: As scheduled.
14. Valve Finish: As scheduled.

2.8 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 that complies with AWWA C550 or that is FDA approved, epoxy coated 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: 0.020 inch.
 - b. Strainers NPS 2-1/2 to NPS 4: 0.045 inch.

- c. Strainers NPS 5 and Larger: 0.10 inch.
- 6. Drain: Pipe plug.

2.9 HOSE STATIONS

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

- 1. [ARCHON Industries, Inc.](#)
- 2. [Armstrong International, Inc.](#)
- 3. [Cooney Brothers, Inc.](#)
- 4. [DynaFluid Ltd.](#)
- 5. [Leonard Valve Company.](#)
- 6. [Strahman Valves, Inc.](#)
- 7. [T & S Brass.](#)

- B. Single-Temperature-Water Hose Stations:

- 1. Standard: ASME A112.18.1.
- 2. Cabinet: Stainless-steel enclosure with exposed valve handle, hose connection, and hose rack. Include thermometer in front.
- 3. Hose-Rack Material: Stainless steel.
- 4. Body Material: As scheduled.
- 5. Body Finish: As scheduled.
- 6. Mounting: As scheduled.
- 7. Supply Fittings: As scheduled.
- 8. Hose: As scheduled.
- 9. Nozzle: With hand-squeeze, on-off control.
- 10. Vacuum Breaker:
 - a. Integral or factory-installed, nonremovable, manual-drain-type, hose-connection vacuum breaker complying with ASSE 1011 or backflow preventer complying with ASSE 1052.
 - b. Garden-hose thread complying with ASME B1.20.7 on outlet.

- C. Hot- and Cold-Water Hose Stations >:

- 1. Standard: ASME A112.18.1.
- 2. Faucet Type: Thermostatic mixing valve.
- 3. Cabinet: Stainless-steel enclosure with exposed valve handles, hose connection, and hose rack. Include thermometer in front.
- 4. Hose-Rack Material: Stainless steel.
- 5. Body Material: Bronze with stainless-steel wetted parts.
- 6. Body Finish: Rough bronze.
- 7. Mounting: Wall, with reinforcement.
- 8. Supply Fittings: As scheduled.
- 9. Hose: As scheduled.
- 10. Nozzle: With hand-squeeze, on-off control.

11. Vacuum Breaker: Integral or factory-installed, nonremovable, manual-drain-type, hose-connection vacuum breaker complying with ASSE 1011 or backflow preventer complying with ASSE 1052; and garden-hose thread complying with ASME B1.20.7 on outlet.

2.10 HOSE BIBBS

A. Hose Bibbs:

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 nonremovable, 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.
13. Operation for Finished Rooms: Wheel handle.
14. Include operating key with each operating-key hose bibb.
15. Include integral wall flange with each chrome- or nickel-plated hose bibb.

2.11 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.

B. Gate-Valve-Type, Hose-End Drain Valves:

1. Standard: MSS SP-80 for gate valves.
2. Pressure Rating: Class 125.
3. Size: NPS 3/4.
4. Body: ASTM B 62 bronze.
5. Inlet: NPS 3/4 threaded or solder joint.

6. Outlet: Garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

C. Stop-and-Waste Drain Valves:

1. Standard: MSS SP-110 for ball valves or MSS SP-80 for gate 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.

2.12 WATER-HAMMER ARRESTERS

A. Water-Hammer Arresters:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [AMTROL, Inc.](#)
 - b. [Josam Company.](#)
 - c. [MIFAB, Inc.](#)
 - d. [Precision Plumbing Products, Inc.](#)
 - e. [Sioux Chief Manufacturing Company, Inc.](#)
 - f. [Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.](#)
 - g. [Tyler Pipe; Wade Div.](#)
 - h. [Watts Drainage Products.](#)
 - i. [Zurn Industries, LLC; Plumbing Products Group; Specification Drainage Products.](#)
2. Standard: ASSE 1010 or PDI-WH 201.
3. Type: Copper tube with piston.
4. Size: ASSE 1010, Sizes AA and A through F, or PDI-WH 201, Sizes A through F.

2.13 TRAP-SEAL PRIMER DEVICE

A. Supply-Type, Trap-Seal Primer Device:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [MIFAB, Inc.](#)
 - b. [Precision Plumbing Products, Inc.](#)
 - c. [Sioux Chief Manufacturing Company, Inc.](#)
 - d. [Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.](#)
 - e. [Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.](#)
2. Standard: ASSE 1018.

3. Pressure Rating: 125 psig minimum.
4. Body: Bronze.
5. Inlet and Outlet Connections: NPS 1/2 threaded, union, or solder joint.
6. Gravity Drain Outlet Connection: NPS 1/2 threaded or solder joint.
7. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.

B. Drainage-Type, Trap-Seal Primer Device:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Smith, Jay R. Mfg. Co.: Division of Smith Industries, Inc.](#)
 - b. Zurn Industries, LLC.
2. Standard: ASSE 1044, lavatory P-trap with NPS 3/8 minimum, trap makeup connection.
3. Size: NPS 1-1/4 minimum.
4. Material: Chrome-plated, cast brass.

2.14 TRAP-SEAL PRIMER SYSTEMS

A. Trap-Seal Primer Systems:

1. Manufacturers: Subject to compliance with requirements, provide products by the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. [Precision Plumbing Products, Inc.](#)
2. Standard: ASSE 1044.
3. Piping: NPS 3/4, ASTM B 88, Type L; copper, water tubing.
4. Cabinet: Surface-mounted steel box with stainless-steel cover.
5. Electric Controls: 24-hour timer, solenoid valve, and manual switch for 120-V ac power.
 - a. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
6. Vacuum Breaker: ASSE 1001.
7. Number Outlets: Four.
8. Size Outlets: NPS 1/2.

2.15 SPECIALTY VALVES

- A. Comply with requirements for general-duty metal valves in Section 15111 "General-Duty Valves for Plumbing Piping."
- B. CPVC Union Ball Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [American Valve, Inc.](#)
 - b. [Asahi/America.](#)
 - c. [Colonial Engineering, Inc.](#)
 - d. [Georg Fischer LLC; GF Piping Systems.](#)
 - e. [Hayward Flow Control Systems; Hayward Industrial Products, Inc.](#)
 - f. [IPEX.](#)
 - g. [NIBCO Inc.](#)
 - h. [Spears Manufacturing Company.](#)
 - i. [Thermoplastic Valves Inc.](#)
2. Description:
 - a. Standard: MSS SP-122.
 - b. Pressure Rating and Temperature: 150 psig at 73 deg F.
 - c. Body Material: CPVC.
 - d. Body Design: Union type.
 - e. End Connections for Valves NPS 2 and Smaller: Detachable, socket or threaded.
 - f. End Connections for Valves NPS 2-1/2 to NPS 4: Detachable, socket or threaded.
 - g. Ball: CPVC; full port.
 - h. Seals: PTFE or EPDM-rubber O-rings.
 - i. Handle: Tee shaped.

C. PVC Union Ball Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [American Valve, Inc.](#)
 - b. [Asahi/America.](#)
 - c. [Colonial Engineering, Inc.](#)
 - d. [Georg Fischer LLC; GF Piping Systems.](#)
 - e. [Hayward Flow Control Systems; Hayward Industrial Products, Inc.](#)
 - f. [IPEX.](#)
 - g. [Jomar International.](#)
 - h. [KBI Company.](#)
 - i. [Legend Valve.](#)
 - j. [McDonald, A. Y. Mfg. Co.](#)
 - k. [NIBCO Inc.](#)
 - l. [Spears Manufacturing Company.](#)
 - m. [Thermoplastic Valves Inc.](#)
2. Description:
 - a. Standard: MSS SP-122.
 - b. Pressure Rating and Temperature: 150 psig at 73 deg F.
 - c. Body Material: PVC.

- d. Body Design: Union type.
- e. End Connections for Valves NPS 2 and Smaller: Detachable, socket or threaded.
- f. End Connections for Valves NPS 2-1/2 to NPS 4: Detachable, socket or threaded.
- g. Ball: PVC; full port.
- h. Seals: PTFE or EPDM-rubber O-rings.
- i. Handle: Tee shaped.

D. CPVC Non-Union Ball Valves:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [American Valve, Inc.](#)
 - b. [Asahi/America.](#)
 - c. [KBI Company.](#)
 - d. [Legend Valve.](#)
 - e. [NIBCO Inc.](#)
 - f. [Spears Manufacturing Company.](#)
 - g. [Thermoplastic Valves Inc.](#)
- 2. Description:
 - a. Standard: MSS SP-122.
 - b. Pressure Rating and Temperature: 150 psig at 73 deg F.
 - c. Body Material: CPVC.
 - d. Body Design: Non-union type.
 - e. End Connections: Socket or threaded.
 - f. Ball: CPVC; full or reduced port.
 - g. Seals: PTFE or EPDM-rubber O-rings.
 - h. Handle: Tee shaped.

E. PVC Non-Union Ball Valves:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [American Valve, Inc.](#)
 - b. [Asahi/America.](#)
 - c. [Colonial Engineering, Inc.](#)
 - d. [Georg Fischer LLC; GF Piping Systems.](#)
 - e. [Hayward Flow Control Systems; Hayward Industrial Products, Inc.](#)
 - f. [IPEX.](#)
 - g. [Jomar International.](#)
 - h. [KBI Company.](#)
 - i. [Legend Valve.](#)
 - j. [McDonald, A. Y. Mfg. Co.](#)
 - k. [NIBCO Inc.](#)
 - l. [Spears Manufacturing Company.](#)
 - m. [Thermoplastic Valves Inc.](#)

2. Description:

- a. Standard: MSS SP-122.
- b. Pressure Rating and Temperature: 150 psig at 73 deg F.
- c. Body Material: PVC.
- d. Body Design: Non-union type.
- e. End Connections: Socket or threaded.
- f. Ball: PVC; full or reduced port.
- g. Seals: PTFE or EPDM-rubber O-rings.
- h. Handle: Tee shaped.

F. CPVC Butterfly Valves:

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

- a. [Georg Fischer LLC; GF Piping Systems.](#)
- b. [Hayward Flow Control Systems; Hayward Industrial Products, Inc.](#)
- c. [NIBCO Inc.](#)
- d. [Spears Manufacturing Company.](#)
- e. [Thermoplastic Valves Inc.](#)

2. Description:

- a. Pressure Rating and Temperature: 150 psig at 73 deg F.
- b. Body Material: CPVC.
- c. Body Design: Lug or wafer type.
- d. Seat: EPDM rubber.
- e. Seals: PTFE or EPDM-rubber O-rings.
- f. Disc: CPVC.
- g. Stem: Stainless steel.
- h. Handle: Lever.

G. PVC Butterfly Valves:

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

- a. [American Valve, Inc.](#)
- b. [Asahi/America.](#)
- c. [Colonial Engineering, Inc.](#)
- d. [Georg Fischer LLC; GF Piping Systems.](#)
- e. [Hayward Flow Control Systems; Hayward Industrial Products, Inc.](#)
- f. [IPEX.](#)
- g. [Legend Valve.](#)
- h. [NIBCO Inc.](#)
- i. [Spears Manufacturing Company.](#)
- j. [Thermoplastic Valves Inc.](#)

2. Description:

- a. Pressure Rating and Temperature: 150 psig at 73 deg F.
- b. Body Material: PVC.
- c. Body Design: Lug or wafer type.
- d. Seat: EPDM rubber.
- e. Seals: PTFE or EPDM-rubber O-rings.
- f. Disc: PVC.
- g. Stem: Stainless steel.
- h. Handle: Lever.

H. CPVC Ball Check Valves:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [American Valve, Inc.](#)
 - b. [Asahi/America.](#)
 - c. [Colonial Engineering, Inc.](#)
 - d. [Georg Fischer LLC; GF Piping Systems.](#)
 - e. [Hayward Flow Control Systems; Hayward Industrial Products, Inc.](#)
 - f. [IPEX.](#)
 - g. [NIBCO Inc.](#)
 - h. [Spears Manufacturing Company.](#)
 - i. [Thermoplastic Valves Inc.](#)
- 2. Description:
 - a. Pressure Rating and Temperature: 150 psig at 73 deg F.
 - b. Body Material: CPVC.
 - c. Body Design: Union-type ball check.
 - d. End Connections for Valves NPS 2 and Smaller: Detachable, socket or threaded.
 - e. End Connections for Valves NPS 2-1/2 to NPS 4: Detachable, socket or threaded.
 - f. Ball: CPVC.
 - g. Seals: EPDM- or FKM-rubber O-rings.

I. PVC Ball Check Valves:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [American Valve, Inc.](#)
 - b. [Asahi/America.](#)
 - c. [Colonial Engineering, Inc.](#)
 - d. [Georg Fischer LLC; GF Piping Systems.](#)
 - e. [Hayward Flow Control Systems; Hayward Industrial Products, Inc.](#)
 - f. [IPEX.](#)
 - g. [Legend Valve.](#)
 - h. [NIBCO Inc.](#)
 - i. [Spears Manufacturing Company.](#)
 - j. [Thermoplastic Valves Inc.](#)

2. Description:

- a. Pressure Rating and Temperature: 150 psig at 73 deg F.
- b. Body Material: PVC.
- c. Body Design: Union-type ball check.
- d. End Connections for Valves NPS 2 and Smaller: Detachable, socket or threaded.
- e. End Connections for Valves NPS 2-1/2 to NPS 4: Detachable, socket or threaded.
- f. Ball: PVC.
- g. Seals: EPDM- or FKM-rubber O-rings.

J. CPVC Gate Valves:

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

- a. [Georg Fischer LLC; GF Piping Systems.](#)
- b. [Spears Manufacturing Company.](#)

2. Description:

- a. Pressure Rating and Temperature: 150 psig] at 73 deg F.
- b. Body Material: CPVC.
- c. Body Design: Nonrising stem.
- d. End Connections for Valves NPS 2 and Smaller: Socket or threaded.
- e. End Connections for Valves NPS 2-1/2 to NPS 4: Socket or threaded.
- f. Gate and Stem: Plastic.
- g. Seals: EPDM rubber.
- h. Handle: Wheel.

K. PVC Gate Valves:

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

- a. [Asahi/America.](#)
- b. [Georg Fischer LLC; GF Piping Systems.](#)
- c. [KBI Company.](#)
- d. [Spears Manufacturing Company.](#)

2. Description:

- a. Pressure Rating and Temperature: 150 psig at 73 deg F.
- b. Body Material: PVC.
- c. Body Design: Nonrising stem.
- d. End Connections for Valves NPS 2 and Smaller: Socket or threaded.
- e. End Connections for Valves NPS 2-1/2 to NPS 4: Socket or threaded.
- f. Gate and Stem: Plastic.
- g. Seals: EPDM rubber.
- h. Handle: Wheel.

2.16 FLEXIBLE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. [Flex-Hose Co., Inc.](#)
 2. [Flexicraft Industries.](#)
 3. [Flex Pression, Ltd.](#)
 4. [Flex-Weld Incorporated.](#)
 5. [Hyspan Precision Products, Inc.](#)
 6. [Mercer Gasket & Shim, Inc.](#)
 7. [Metraflex, Inc.](#)
 8. [Proco Products, Inc.](#)
 9. [TOZEN Corporation.](#)
 10. [Unaflex.Universal Metal Hose; a Hyspan company.](#)
- B. 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 and Smaller: Threaded copper pipe or plain-end copper tube.
 3. End Connections NPS 2-1/2 and Larger: Flanged copper alloy.
- C. 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 and Smaller: Threaded steel-pipe nipple.
 3. End Connections NPS 2-1/2 and Larger: Flanged steel nipple.

2.17 WATER METERS

- A. Displacement-Type Water Meters:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [AALIAN; a Venture Measurement product line.ABB.Badger Meter, Inc.](#)
 - b. [Carlson Meter.](#)
 - c. [Mueller Co. Ltd.; a subsidiary of Mueller Water Products Inc.](#)
 - d. [Schlumberger Limited; Water Services.](#)
 - e. [Sensus.](#)
 2. Description:
 - a. Standard: AWWA C700.
 - b. Pressure Rating: 150-psig working pressure.
 - c. Body Design: Nutating disc; totalization meter.
 - d. Registration: In gallons or cubic feet as required by utility company.

- e. Case: Bronze.
- f. End Connections: Threaded.

B. Turbine-Type Water Meters:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [AALIANT; a Venture Measurement product line.](#)
 - b. [ABB.](#)
 - c. [Badger Meter, Inc.](#)
 - d. [Hays Fluid Controls.](#)
 - e. [Master Meter, Inc.](#)
 - f. [McCrometer, Inc.](#)
 - g. [Mueller Co. Ltd.; a subsidiary of Mueller Water Products Inc.](#)
 - h. [Schlumberger Limited](#); Water Services.
 - i. [SeaMetrics Inc.](#)
 - j. [Sensus.](#)
2. Description:
 - a. Standard: AWWA C701.
 - b. Pressure Rating: 150-psig working pressure.
 - c. Body Design: Turbine; totalization meter.
 - d. Registration: In gallons or cubic feet as required by utility company.
 - e. Case: Bronze.
 - f. End Connections for Meters NPS 2 and Smaller: Threaded.
 - g. End Connections for Meters NPS 2-1/2 and Larger: Flanged.

C. Compound-Type Water Meters:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [ABB.](#)
 - b. [Badger Meter, Inc.](#)
 - c. [Master Meter, Inc.](#)
 - d. [Mueller Co. Ltd.; a subsidiary of Mueller Water Products Inc.](#)
 - e. [Schlumberger Limited](#); Water Services.
 - f. [Sensus.](#)
2. Description:
 - a. Standard: AWWA C702.
 - b. Pressure Rating: 150-psig working pressure.
 - c. Body Design: With integral mainline and bypass meters; totalization meter.
 - d. Registration: In gallons or cubic feet as required by utility company.
 - e. Case: Bronze.
 - f. Pipe Connections: Flanged.

- D. Remote Registration System: Direct-reading type complying with AWWA C706; modified with signal-transmitting assembly, low-voltage connecting wiring, and remote register assembly as required by utility company.
- E. Remote Registration System: Encoder type complying with AWWA C707; modified with signal-transmitting assembly, low-voltage connecting wiring, and remote register assembly as required by utility company.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. 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 unacceptable for this application.
 - 3. Do not install bypass piping around backflow preventers.
- B. Install water regulators with inlet and outlet shutoff valves. Install pressure gages on inlet and outlet.
- C. Install water-control valves with inlet and outlet shutoff valves. Install pressure gages on inlet and outlet.
- D. Install balancing valves in locations where they can easily be adjusted.
- E. Install temperature-actuated, water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.
 - 1. Install cabinet-type units recessed in or surface mounted on wall as specified.
- F. Install Y-pattern strainers for water on supply side of each control valve, water pressure-reducing valve, solenoid valve and pump.
- G. Install outlet boxes recessed in wall or surface mounted on wall. Install 2-by-4-inch fire-retardant-treated-wood blocking, wall reinforcement between studs. Comply with requirements for fire-retardant-treated-wood blocking in Section 06100 "Rough Carpentry."
- H. Install hose stations with check stops or shutoff valves on inlets and with thermometer on outlet.
 - 1. Install cabinet-type units recessed in or surface mounted on wall as specified. Install 2-by-4-inch fire-retardant-treated-wood blocking, wall reinforcement

between studs. Comply with requirements for fire-retardant-treated-wood blocking in Section 06100 "Rough Carpentry."

- I. Set nonfreeze, nondraining-type post hydrants in concrete or pavement.
- J. Set freeze-resistant yard hydrants with riser pipe in concrete or pavement. Do not encase canister in concrete.
- K. Install water-hammer arresters in water piping according to PDI-WH 201.
- L. 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.
- M. Install drainage-type, trap-seal primer valves as lavatory trap with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting.
- N. Install trap-seal primer systems with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust system for proper flow.

3.2 CONNECTIONS

- A. Comply with requirements for ground equipment in Section 16060 "Grounding and Bonding for Electrical Systems."

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. Pressure vacuum breakers.
 - 2. Intermediate atmospheric-vent backflow preventers.
 - 3. Reduced-pressure-principle backflow preventers.
 - 4. Double-check, backflow-prevention assemblies.
 - 5. Carbonated-beverage-machine backflow preventers.
 - 6. Dual-check-valve backflow preventers.
 - 7. Reduced-pressure-detector, fire-protection, backflow-preventer assemblies.
 - 8. Double-check, detector-assembly backflow preventers.
 - 9. Water pressure-reducing valves.
 - 10. Calibrated balancing valves.
 - 11. Primary, thermostatic, water mixing valves.
 - 12. Manifold, thermostatic, water mixing-valve assemblies.
 - 13. Photographic-process, thermostatic, water mixing-valve assemblies.
 - 14. Primary water tempering valves.
 - 15. Outlet boxes.
 - 16. Hose stations.
 - 17. Supply-type, trap-seal primer valves.

18. Trap-seal primer systems.

- 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 Section 15076 "Identification for Plumbing Piping and Equipment."

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Test each pressure vacuum breaker, reduced-pressure-principle backflow preventer, double-check, backflow-prevention assembly and [double-check, detector-assembly backflow preventer according to authorities having jurisdiction and the device's reference standard.
- B. Domestic water piping specialties will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

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 15145