

SECTION 221119  
PLUMBING SPECIALTIES

PART 1 - GENERAL

1.1 STIPULATIONS

- A. The specifications sections "General Conditions of Contract", "Special Conditions", and "Division 1 – General Requirements" form a part of this section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.2 RELATED DOCUMENTS

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

1.3 SUMMARY

- A. This Section includes plumbing specialties for water distribution systems; soil, waste, and vent systems; and storm drainage systems.
- B. Products installed but not furnished under this Section include water meters that will be furnished by the utility company to the site and ready for installation. This is the name and address of the utility company:
- C. Related Sections: The following sections contain requirements that relate to this Section:
  - 1. Division 23 Section "General Duty Valves for Mechanical Piping" for gate, ball, butterfly, globe, and check valves.
  - 2. Division 23 Section "Plumbing Piping" for piping and connections.

1.4 SUBMITTALS

- A. Submit product data including rated capacities of selected models and weights (shipping, installation, and operation). Indicate materials, finishes, dimensions, required clearances, and methods of assembly of components; and piping and wiring connections for the following plumbing specialty products:
  - 1. Backflow preventers
  - 2. Strainers.

3. Drain valves.
4. Vent caps, vent terminals, and roof flashing assemblies.

## 1.5 QUALITY ASSURANCE

- A. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.
- B. Electrical Component Standard: NFPA 70, "National Electrical Code."
- C. Listing and Labeling: Provide equipment that is listed and labeled.
  1. The Terms "Listed" and "Labeled": As defined in the "National Electrical Code," Article 100.
  2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.
- D. Design Concept: The Drawings indicate capacities, sizes, and dimensional requirements of system components. Components having equal performance characteristics that deviate from the indicated size and dimensions may be considered, provided deviations do not change the design concept or intended performance. The burden of proof for equality of products is on the Contractor.

## 1.6 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials matching products installed as described below. Package them with protective covering for storage and identify with labels clearly describing contents.
- B. Operating Keys (Handles): Furnish one (1) key for each key-operated hose bibb and hydrant installed.

## PART 2 - PRODUCTS

### 2.1 BACKFLOW PREVENTERS (REDUCED PRESSURE PRINCIPLE)

- A. Manufacturers:
  1. Watts model LF009
  2. Wilkins Model 975
  3. Febco Model 975
- B. Reduced Pressure Backflow Preventers: ANSI/ASSE 1013, AWWA C506; bronze body with bronze and plastic internal parts and stainless-steel springs; two independently operating, spring loaded check valves; diaphragm type differential pressure relief valve located between check valves; third check valve which opens under back pressure in case of diaphragm failure; non- threaded vent outlet; assembled with two gate valves, strainer, and four test cocks.

## 2.2 STRAINERS

- A. Strainers: Y pattern, except where otherwise indicated, full size of connecting piping. Include Type 304 stainless-steel screens with 3/64" perforations except where other screens are indicated.
  - 1. Pressure Rating: 125-psig minimum steam working pressure except where otherwise indicated.
  - 2. Sizes 2" and Smaller: Bronze body, with female threaded ends
  - 3. Y-Type Strainers: Screwed screen retainer with centered blowdown.
    - a. Drain: Pipe plug.
    - b. Drain: Factory- or field-installed, hose-end drain valve.

## 2.3 STACKS

- A. Stack Flashing Fittings: Counterflashing-type, cast-iron fitting, with bottom recess for termination of roofing membrane, and with threaded or hub top for extension of vent pipe.
- B. Vent Caps: Cast-iron body with threaded or hub inlet and vandal-proof design. Included vented hood and set screws to secure to vent pipe.
- C. Vent Terminals: Commercially manufactured, shop-fabricated or field-fabricated, frost-proof assembly constructed of copper. Sized to provide 1" enclosed air space between outside of pipe and inside of flashing collar extension, with counterflashing.

## 2.4 FLASHING MATERIALS

- A. Elastic Membrane: Nonreinforced flexible, black elastic, sheet, 50 to 65-mil thick and complying with the following:
  - 1. Shore A Hardness: ASTM D 2240, 50 to 70
  - 2. Tensile Strength: ASTM D 412, 1200 psi.
  - 3. Tear Resistance: ASTM D 624, Die C, 20 lb per linear inch.
  - 4. Ultimate Elongation: ASTM D 412, 250%.
  - 5. Low-Temperature Brittleness: ASTM D 746, minus 30 deg F (minus 35 deg C).
  - 6. Resistance to Ozone Aging: ASTM D 1149, no cracks for 10% elongated sample for 100 hours in 50-mPa ozone at 104°F (70°C).
  - 7. Resistance to Heat Aging: ASTM D 573, maximum hardness increases of 15 points, elongation reduction of 40%, and tensile strength reduction of 30%, for 70 hours at 212 deg F (100 deg C).
- B. Copper: ASTM B 370, sheet, 16 oz. per sq. ft. (0.0216" thick) except as otherwise indicated.
  - 1. General Use: Temper H00 (formerly cold-rolled)
  - 2. Forming Use: Temper 060 (formerly soft).
- C. Zinc-Coated Steel: ASTM A 526, sheet, with 0.20% copper, G90 hot-dip galvanized, mill phosphatized where indicated for painting; 0.0359" thick (20 gage) except as otherwise indicated.

- D. Fasteners: Metal compatible with material and substrate being fastened.
  - E. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units as required for installation; matching or compatible with material being installed.
  - F. Solder: ASTM B 32, Alloy Sn50.
- Bituminous Coating: SSPC-12, solvent type, bituminous mastic.

## 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 brakes 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 pump and as indicated on the drawings.
- E. Install outlet boxes recessed in wall. Install 2-by-4-inch fire-retardant-treated-wood blocking wall reinforcement between studs.
- F. Install water hammer arresters in water piping according to PDI-WH 201.
- G. Install wall hydrants with integral or field-installed vacuum breaker.
- H. Install cleanouts in above-ground piping and building drain piping as indicated, and where not indicated, according to the following:
  - 1. Size same as drainage piping up to 4" size. Use 4" size for larger drainage piping except where larger size cleanout is indicated.
  - 2. Locate at each change in direction of piping greater than 45 deg.
  - 3. Locate at minimum intervals of 50' for piping 4" and smaller and 100' for larger piping.
  - 4. Locate at base of each vertical soil or waste stack.

- I. Install cleanout deck plates (covers), of types indicated, with top flush with finished floor, for floor cleanouts for piping below floors.
- J. Install flashing flange and clamping device with each stack and cleanout passing through floors having waterproof membrane
- K. Install vent flashing sleeves on stacks passing through roof. Secure over stack flashing according to the manufacturer's written instructions.
- L. Install frost-proof vent caps on each vent pipe passing through roof. Maintain 1" clearance between vent pipe and roof substrate.

### 3.2 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping and specialties.
- B. Supply Runouts to Fixtures: Install hot- and cold-water supply piping runouts to fixtures of sizes indicated, but not smaller than required by plumbing code.
- C. Drainage Runouts to Fixtures: Provide drainage and vent piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated, but not smaller than required by plumbing code.
- D. Locate drainage piping runouts as close as possible to bottom of floor slab supporting fixtures or drains.

### 3.3 FLASHING INSTALLATION

- A. Provide flashing manufactured in a single piece except where large pans, sumps, or other drainage shapes are required.
- B. Install 16-oz.-per sq. ft. copper, except when another weight or material is specified.
- C. Solder joints of copper sheets where required.
- D. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with membrane waterproofing.
  - 1. Pipe Flashing: Sleeve type, matching pipe size, with minimum sleeve length of 10", and skirt or flange extending at least 8" around pipe.
  - 2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8" around sleeve.
  - 3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8" around specialty.
- E. Set flashing on floors and roofs in solid coating of bituminous cement.
- F. Secure flashing into sleeve and specialty clamping ring or device.

- G. Install flashing for piping passing through roofs with counter flashing or commercially made flashing fittings, according to Division 7 Section "Flashing and Sheet Metal."
- H. Extend flashing up vent pipe passing through roofs and turn down into pipe or secure flashing into cast-iron sleeve having calking recess.
- I. Fabricate and install copper sheet flashing and pans, sumps, and other drainage shapes as indicated. Install drain connection when indicated.

### 3.4 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-principal backflow preventers.
- 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 23 Section "Identification for Mechanical Piping and Equipment."

### 3.5 FIELD QUALITY CONTROL

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

### 3.6 COMMISSIONING

- A. Preparation: Perform the following checks before start-up:
  - 1. Systems tests are complete.
  - 2. Damaged and defective specialties and accessories have been replaced or repaired.
  - 3. There is clear space for servicing of specialties.
- B. Before operating systems, perform these steps:
- C. Close drain valves, hydrants, and hose bibbs.
- D. Open valves to fully open position.
- E. Remove and clean strainers.
- F. Verify drainage and vent piping are clear of obstructions. Flush with water until clear.

### 3.7 ADJUSTING

- A. Set field-adjustable flow set points of balancing valves.
- B. Set field-adjustable temperature set points of temperature-actuated water mixing valves.
- C. Adjust operating and correct deficiencies discovered during commissioning.

### 3.8 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- B. Place plugs in ends of uncompleted piping at end of construction day or when work stops.

END OF SECTION 221119