

SECTION 15401

PLUMBING, PIPING AND SPECIALTIES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Furnish and install a complete piping system including all required specialties and appurtenances as indicated on the Drawings and as herein specified.
- B. Related Work Specified Elsewhere:
 1. "Polyvinyl Chloride (PVC) Drainage Pipe" is specified in Section 15051.
 2. "Acid Resistant Drainage Pipe" is specified in Section 15054.
 3. "Copper Pipe & Fittings" is specified in Section 15063.
 4. "Cast Iron Drainage Pipe" is specified in Section 15077.
 5. "Polyethylene Pipe" is specified in Section 15076.
 6. "Plumbing General" is specified in Section 15400.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Pipe and Fittings:
 1. Sanitary Waste and Vent:
 - a. Below Floor Slabs: Service weight cast iron soil pipe and fittings, bell and spigot with "push-on" gaskets.
 - b. Above ground building lines:
 - (1) Service weight cast iron no hub soil pipe and fittings.
 - (2) Or Schedule 40 polyvinyl chloride "DWV" pipe and solvent cement socket type drainage fittings (when permitted by local codes).
 2. Roof Drainage:
 - a. Below Floor Slab: Service weight cast iron soil pipe and fittings, bell and spigot with "push-on" gaskets.
 - b. Above ground building lines:
 - (1) Service weight cast iron no hub soil pipe and fittings.
 - (2) Or Schedule 40 poly vinyl chloride "DWV" pipe and solvent cement socket type drainage fittings (when permitted by local codes).
 3. Acid Waste and Vent:
 - a. Acid resisting flame retardant polypropylene drainage pipe and fittings, thermal fusion or mechanical joints.
 - b. Or acid resisting cast iron soil pipe and drainage fittings, mechanical joints.
 4. Domestic and Process Water:
 - a. Building Water Service - Type "L" copper tube or 160 psi polyethylene pipe with push-on elastomeric joint seals.
 - b. Interior Building Lines - Type "L" copper tube, solder fittings.

5. Gas Lines:
 - a. Less than 1/2 inch: Type "K" soft or hard temper copper tube with AGA approved gas tubing fittings or brazed solder fittings.
 - b. 1/2 inch and larger: Schedule 40 black steel with malleable iron fittings.
 6. L.P. Gas system (all materials must meet NFPA 58 standard and the National Fuel Gas Code as it applies to L.P. Gas):
 - a. 1/2 inch and less: Type "L" soft or hard temper copper tube with approved L.P. gas tubing fittings or brazed fittings.
 - b. 3/4 inch and larger: Schedule 40, ASTM A-53, Grade B steel pipe with malleable iron fittings.
 7. Other process piping: As indicated on the Drawings.
- B. Solder and Flux:
1. Solid string or wire solder, 95 percent tin, 5% antimony on all pressure piping and potable water piping.
 2. Silver solder, 45% brazing silver alloy (where indicated).
 3. Flux: Non-corrosive paste type as required for type of solder.
 4. Solder and flux used on domestic water lines shall be lead free.
 5. Other process piping: As indicated on the Drawings.
- C. Valves:
1. Acceptable Manufacturers:
 - a. Stockham.
 - b. Crane.
 - c. Walworth.
 - d. Jenkins.
 - e. Nibco
 - f. Or approved equal.
 2. Gate Valves:
 - a. Up to and including 2-1/2 inch - screwed or solder end, bronze body, rising stem, solid bronze disc, 125 psi steam pressure 200 psi W.O.G. Equal to Nibco T-111 or S-111.
 - b. 3-inch and larger - refer to Section 15101 - General Service OS&Y - 3 inches and larger.
 3. Globe Valves:
 - a. Up to and including 2-1/2 inch - screwed or solder end, bronze body, TFE disc, 125 psi steam pressure 200 psi W.O.G. Equal to Nibco T-211 or S-211.
 - b. 3 inch and larger - refer to Section 15102 - General Service 3 inches and larger.
 4. Check Valves:
 - a. Up to and including 2-1/2 inch - screwed or solder end, bronze body, Buna-N disc, 200 psi WOG cold pressure. Equal to Nibco T-413-W or S-413-W.
 - b. 3 inch and larger - refer to Section 15110 - Valves - 3 inches and larger.
 5. Ball Valve: Acceptable in lieu of gate and globe valves for 2 inch and smaller, full port bronze ball, threaded or solder ends, 3 part bronze body, TFE or equal

- resilient seat, lever handle, 400 lb. WOG. Equal to NIBCO S-595-Y (soldered end connection) or NIBCO T-595-Y (threaded end connection).
6. PVC Valves and Specialties: Corrosion resistant as specified in the appropriate Section of this Division.
 7. Shear-gate Valve: Cast iron, straight-through type, bronze manually operated shear-gate with non-rising stem, and hub connections. Equal to Josam 67390 series.
 8. Backwater Valves: Coated cast iron, offset type, bronze swing check assembly, hub and spigot connections, bolted gasketed cover equal to Josam Series 67500.
- D. Insulation: Insulation shall be provided as specified in "Pipe and Equipment Insulation" Section in this Division.
- E. Drainage and Pipe Specialties:
1. Acceptable Manufacturers:
 - a. Zurn.
 - b. Josam.
 - c. J.R. Smith.
 - d. Or approved equal.
 2. Floor Drains:
 - a. Type "A" - cast iron body, drainage flange, flashing clamp, adjustable 7 inch diameter nickel-bronze strainer. Equal to Zurn Z-415 with Type "B" strainer.
 - b. Type "B" - cast iron body, extra heavy duty drain, flashing clamp, 15" top, 8" outlet size. Equal to Zurn Z-503.
 - c. Type "C" - cast iron body, drainage flange, flashing clamp, extra heavy cast iron loose slotted grate, with suspended sediment bucket. Equal to Zurn Z-610, 4" outlet.
 - d. Type "D" - cast iron body, deep sump, bottom outlet, seepage pan and membrane flashing clamp, 9 inch diameter, heavy duty cast iron deep flange grate. Equal to Zurn Z-511, 3" outlet.
 - e. Type "E" - cast iron body, drainage flange, 12 inch x 12 inch heavy duty hinged cast iron grate, cast iron sediment bucket. Equal to Zurn Z-610H.
 3. Cleanouts:
 - a. Floor Cleanouts:
 - 1) Cast iron body, anchor flange with clamp collar, cast iron cover, internal brass plug. Equal to Zurn Z-1400-KC-BP. (For use in concrete floor areas.)
 - 2) Cast iron body, anchor flange with clamp collar, round scoriated Nickel Bronze top (adjustable), internal brass/bronze plug. Equal to Zurn ZN-1400-BP. (For use in finished floor areas, if floor is carpeted supply with carpet top and marker.)
 - b. End Cleanouts: Cast iron body, ABS tapered thread plug. Equal to Zurn Z-1440.
 - c. Wall Cleanouts: Cleanout tee fitting, brass countersunk plug, round stainless steel access cover with securing screw. Equal to Zurn Z-1446.

4. Roof Drains:
 - a. Type "RD-1": 15" diameter roof drain, cast iron body with combination membrane flashing clamp/gravel guard and low silhouette poly-dome. Adjustable extension assembly, static extension and underdeck clamp equal to Zurn model Z100-EA-E-C.
 5. Parapet Scuppers: Downspout nozzle with wall flange, plain bronze threaded inlet and decorative face of wall flange and outlet nozzle. Equal to Zurn Z-199. 6 inch x 7 inch top scupper drain/cast iron body. Plain bronze oblique strainer with 90° combination frame and membrane flashing clamp. Equal to Zurn Z-187.
 6. Non-Freeze Hydrants: Cast brass anti-siphon non-freeze wall hydrant, 3/4 inch hose thread outlet, polished brass face, key handle, brass wall casing of proper length, 3/4 inch straight IPS inlet, integral vacuum breaker. Equal to Zurn Z-1310.
 7. Washdown Station: Volume control valve, wall mounting bracket, outlet with pipe supports, vacuum breaker, hose connection, chrome plated finish, stainless steel hose rack. Leonard Model SW-75-1571.
 8. Plumbing Fixture Carriers: See Specification Section 15450 for specific fixture carrier.
 9. Post Hydrant-Non-Freeze Type: Bronze casing with cast aluminum casing guard, all bronze interior parts and non-turning operating rod with free floating compression closure valve, 1" hose connection, operating key and tapped drain port in valve housing equal to Zurn Z-1385. 1" IPS inlet and 6'-0" depth of bury.
 10. Shock Absorbers: PDI rated water hammer arrestors, stainless steel shell, gas charged expansion chamber, stainless steel or elastomer bellows. PDI size as indicated on the Drawings. Equal to Zurn Z-1700 Series.
 11. Electronic Trap Primer: Employs the use of a subminiature solenoid valve, air gap and electronic controller, 115V AC, equal to Precision Plumbing Products, Inc.
- F. Pressure Reducing Valve: Direct operating for dead end service, self-contained, 125 lb. bronze body, screwed ends, adjustable, spring loaded, diaphragm actuated, stainless steel seat, composition disc, integral strainer, thermal expansion by-pass. Size and pressure range as indicated on the Drawings. Watts #U5B, Leslie, or approved equal.
- G. Thermostatic Domestic Water Tempering Valve: Self-contained bronze body three-way mixing valve with liquid filled or bi-metal thermostatic element, adjustable discharge range 80 degrees F to 140 degrees F, flow capacity not less than as noted at 20 psi differential, "fail-safe" feature on failure of either hot or cold water supply or of thermostatic element. Provide with combination strainer-check stops, union inlets and outlet pipe. Finish to be sprayed satin or rough brass. Leonard Type TM, Symmons 5-200 or approved equal.

- H. Backflow Preventers:
 - 1. Double spring-loaded check valve assembly with automatically operating reduced pressure relief valve located in the pressure zone between the two check valves.
 - 2. All bronze construction with stainless steel internals, union or flanged connections.
 - 3. Inlet and outlet gate valves and inlet strainer.
 - 4. Test cocks on inlet, relief, and outlet pressure zones.
 - 5. Size, flow capacity and pressure drop as shown on the Drawings.
 - 6. N.S.F. and A.S.S.E. tested and approved.
 - 7. Air gap drain.
 - 8. 1/2 inch - 3/4 inch sizes: Watts #9D, FEBCO #815, Beeco #12. 1 inch - larger: Watts #909, FEBCO #825, Beeco #6-C.
- I. Vacuum Relief Valves: Bronze body, automatic venting, vacuum relief valve, 3/4 inch inlet. Equal to Watts 36A.
- J. Pressure and Temperature Relief Valves: ASME rated bronze body automatic reseating combined pressure and temperature relief valve, thermostat element operated, test lever, 125 psi pressure relief setting. Equal to Watts 40XL.
- K. Hose:
 - 1. Hose for Hose Bibbs:
 - a. Flexible rubber hose reinforced with two layers of tire cord, smooth internal tube surface, working pressure not less than 150 psi. Size as shown on drawings. 50 foot length equal to swan No. CD3450.
- L. Hose Racks:
 - 1. Hose Racks for Hose Bibbs:
 - a. Provide hose racks for flushing connection hoses at all wall mounted hose bibb locations shown on the Drawings or as directed.
 - b. Hose racks shall be stainless steel welded construction (.125" bracket, .250 rack) #4 finish. Equal to Leonard Model HDHR.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide offsets in all piping to place in proper position and avoid work of other trades.
- B. The supply lines or fittings for every plumbing fixture shall be so installed as to prevent backflow.
- C. Install all valves with stems horizontally to upright. Do not install with stems down.
- D. Adjust pressure reducing valve, and tempering valve as directed by the Engineer.
- E. Where plastic piping joins metal piping, threaded adapters shall be installed only with plastic male into metal female.
- F. Set exterior non-freeze wall hydrant 24" inches above finish grade.
- G. Floor drains shall be provided with a waste and P-trap of same size as the drain branch where shown unless noted otherwise.

- H. Install air gap drain on all reduced pressure zone backflow preventers that are designed to accommodate one. Pipe drain to nearest floor drain if available or to 6" above finish floor one pipe size larger than the backflow preventer drain.

END OF SECTION