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336313 - Steam Distribution

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SECTION 33 6313 - STEAM DISTRIBUTION

1.1 SUMMARY

A. Section includes underground piping outside the building for distribution of steam and condensate.

B. See Chapter 5, Division 01, Section 017700.1.1.B.1.i Closeout Procedures - Project Record Documents for equipment list requirements for all equipment provided in this section.

1.2 QUALITY ASSURANCE

A. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.

B. ASME Compliance: Safety valves and pressure vessels shall bear appropriate ASME labels.

C. Tracer Wire: Refer to Chapter 5, Division 01 Section 011000 1.3 N. 1 'General Requirements.'

1.3 STEEL PIPES AND FITTINGS

A. Steel Pipe: ASTM A 53/A 53M, Type E, Grade A, wall thickness as indicated in "Piping Application" Article; black with plain ends.

B. Cast-Iron, Threaded Fittings: ASME B16.4, Class 125 and Class 250, standard pattern, with threads according to ASME B1.20.1.

C. Malleable-Iron, Threaded Fittings: ASME B16.3, Class 150 and Class 300, with threads according to ASME B1.20.1.

D. Wrought Cast- and Forged-Steel Flanges and Flanged Fittings: ASME B16.5, including bolts, nuts, and gaskets of the following material group, end connections, and facings:

1. Material Group: 1.1.
2. End Connections: Butt welding.
3. Facings: Raised face.

E. Steel Welding Fittings: ASME B16.9 and ASTM A 234/A 234M, seamless or welded.

1. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

F. Nipples: ASTM A 733, Standard Weight, seamless, carbon-steel pipe complying with ASTM A 53/A 53M.

G. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.

1. ASME B16.21, nonmetallic, flat, asbestos free, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated.

a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.

H. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

1.4 CONDUIT PIPING SYSTEM

A. Conduit Piping System: Factory-fabricated and -assembled, airtight and watertight, drainable, pressure-tested piping with conduit, inner pipe supports, and insulated carrier piping. Fabricate so insulation can be dried in place by forcing dry air through conduit.

1. Manufacturers:

a. Insul-Tek Piping Systems, Inc.
b. Perma-Pipe, Inc.
c. Rovanco Piping Systems, Inc.
d. Thermacor Process, L.P.

B. Carrier Pipe: Steel pipe and fittings.

C. Carrier Pipe Insulation:

1. Mineral-Wool Pipe Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, 850 deg F (454 deg C) or Type II, 1200 deg F (649 deg C), Grade A.

a. Bands: ASTM A 666, Type 304, stainless steel, 3/4 inch (19 mm) wide, 0.020 inch (0.5 mm) thick.

2. Calcium Silicate Pipe Insulation: Flat-, curved-, and grooved-block sections of noncombustible, inorganic, hydrous calcium silicate with a non-asbestos fibrous reinforcement. Comply with ASTM C 533, Type I.

a. Bands: ASTM A 666, Type 304, stainless steel, 3/4 inch (19 mm) wide, 0.020 inch (0.5 mm) thick.

3. Polyisocyanurate Foam Pipe Insulation: Unfaced, preformed, rigid cellular polyisocyanurate material intended for use as thermal insulation.

a. Comply with ASTM C 591, Type I or Type IV, except thermal conductivity (k-value) shall not exceed 0.19 Btu x in./h x sq. ft. x deg F (0.027 W/m x K) at 75 deg F (24 deg C) after 180 days of aging.

b. Flame-spread index shall be 25 or less and smoke-developed index shall be 50 or less for thickness up to 1-1/2 inches (38 mm) as tested by ASTM E 84.
c. Fabricate shapes according to ASTM C 450 and ASTM C 585.

4. Polyurethane Foam Pipe Insulation: Unfaced, preformed, rigid cellular polyurethane material intended for use as thermal insulation.

a. Comply with ASTM C 591, Type I or Type IV, except thermal conductivity (k-value) shall not exceed 0.19 Btu x in./h x sq. ft. x deg F (0.027 W/m x K) at 75 deg F (24 deg C) after 180 days of aging.
b. Flame-spread index shall be 25 or less and smoke-developed index shall be 50 or less for thickness up to 1-1/2 inches (38 mm) as tested by ASTM E 84.
c. Fabricate shapes according to ASTM C 450 and ASTM C 585.

D. Minimum Clearance:

1. Between Carrier Pipe Insulation and Conduit: 1 inch (25 mm).
2. Between Insulation of Multiple Carrier Pipes: 3/16 inch (4.75 mm).
3. Between Bottom of Carrier Pipe Insulation and Conduit: 1 inch (25 mm).

E. Conduit: Spiral wound, steel.

1. Cover: With polyurethane foam insulation with an HDPE jacket; thickness indicated in "Piping Application" Article.
2. Piping Supports within Conduit: Corrugated galvanized steel with a maximum spacing of 10 feet (3 m).
3. Fittings: Factory-fabricated and -insulated elbows and tees. Elbows may be bent pipe equal to carrier pipe. Tees shall be factory fabricated and insulated, and shall be compatible with the carrier pipe.
4. Expansion Offsets and Loops: Size casing to contain piping expansion.
5. Accessories include the following:

a. Water Shed: Terminal end protector for carrier pipes entering building through floor, 3 inches (75 mm) deep and 2 inches (50 mm) larger than casing; terminate casing 20 inches (500 mm) above the floor level.
b. Guides and Anchors: Steel plate welded to carrier pipes and to casing, complete with vent and drainage openings inside casing.
c. End Seals: Steel plate welded to carrier pipes and to casing, complete with drain and vent openings on vertical centerline.
d. Gland Seals: Packed stuffing box and gland follower mounted on steel plate, welded to end of casing, permitting axial movement of carrier piping, with drain and vent connections on vertical centerline.
e. Joint Kit: Half-shell, pourable or split insulation and shrink-wrap sleeve.

F. Manholes: Black steel with lifting eyes.

1. Finish: Spray-applied urethane, minimum 30 mils (0.75 mm) thick.

2. Access: 30-inch- (750-mm-) diameter waterproof cover with gasket, ladder, and two 6-inch (150-mm) vents, one high and one low, extending above grade with rain caps.
3. Conduit Stub-Outs and Seals: Welded steel with drain and vent openings.
4. Sump: 12 inches (300 mm) in diameter, 12 inches (300 mm) deep.
5. Floatation Anchor: Oversized bottom keyed into concrete base.

G. Source Quality Control: Factory test the conduit to 15 psig (105 kPa) for a minimum of two minutes with no change in pressure. Factory test the carrier pipe to 150 percent of the operating pressure of system. Furnish test certificates.

END OF SECTION 33 6313