
PART 1 - GENERAL

These standards apply to the installation of natural gas piping, meter, associated equipment and materials, and coordination with utility service company.

1.01 DESIGN CRITERIA

A. Drawings and Specifications:

1. Indicate location of gas meters. Tenant spaces shall have separate meters.
2. Include riser diagrams with all flow rates and operating pressures.
3. Locate valves for easy access and provide separate support where necessary.
4. Show invert elevations and points of connection to existing piping.
5. Obtain layout and/or gas piping schematic from AV/F&I prior to design – update with proposed gas loads and locations.

B. Design:

1. Coordination Gas Service: Natural gas service is available in certain areas within the Terminals. If service is not available coordinate with Port of Seattle AV/F&I and pay all charges necessary for complete installation.
2. Horizontal Pipe: Slope to drip legs not less than 1/4-inch in 15-feet.
3. Branch Outlet Location: Take from top or side of horizontal pipe.
4. Drip Leg Location: 6-inch, with globe valve; provide at bottom of vertical pipe.
5. Pressure Reducing Valve Location: Install in horizontal pipe with spring case vertical above body. Pipe relief vent to outside.
6. Testing Requirements for Piping on House Side of Meter: Subject pipe to air pressure of 60 psig for 30 minutes with no perceptible drop in pressure.
7. Testing Requirements for Piping on Main Side of Meter: Subject pipe to air pressure of 1-1/2 times the proposed maximum pressure but not less than 150 psig for 30 minutes with no perceptible drop in pressure.
8. Testing Requirements for all final connections to appliances, unions and connection to meter - visible inspection and non-corrosive leak test as per NFPA 54 section 8.1.
9. Provide insect screen at natural gas vent outlet.

PART 2 - PRODUCTS

2.01 PIPING

- A. ASTM A53, Standard weight, Grade B, electric resistance welded or seamless, black steel.
 - 1. For natural gas piping systems with pressures less than 5 psig:
 - a. Above ground piping NPS 2 and smaller – Steel pipe with malleable iron fittings and threaded joints.
 - b. Above ground piping larger than NPS 2 – Steel pipe with wrought steel fittings and welded joints.
 - 2. For natural gas piping systems with pressures 5 psig and greater:
 - a. Above ground piping – Steel pipe with steel welding fittings and welded joints.
 - 3. Connections to valves and devices for above ground piping larger than NPS 2 shall be flanged.
 - 4. Radiographic and dye penetrant inspection shall be performed on welded joints and fitting connections.

2.02 METERS

- A. Manufacturers: American Meter, Dresser, Itron
- B. Natural Gas meter shall be Diaphragm model type with pulse output for the DDC system with external digital readout in SCFH with 0 +/- 5% accuracy. Meter to be ANSI B109.1 compliant,
- C. Aluminum case with Buna-N diaphragm.

2.03 FITTINGS

- A. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.
- B. Wrought-Steel Welding Fittings: ASTM A 234/A 234M for butt welding.
- C. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.

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- D. Forged-Steel Flanges and Flanged Fittings: ASME B16.5, minimum Class 150, including bolts, nuts, and gaskets of the following material group, end connections, and facings:
1. ASME B16.2, Material Group: 1.1.
 2. End Connections: Threaded or butt welding to match pipe.
 3. Lapped Face: Not permitted underground.
 4. Gasket Materials: ASME B16.20, metallic, flat face, asbestos free, aluminum O-rings, and spiral-wound metal gaskets.

2.04 VALVES

- A. Manufacturers: Stockham, Apollo, Milwaukee, Jamesbury, Tyco, Hammond, Cameron, DeZurik.
- B. Gate Valve: 600 psig WOG, UL label for 250 psi gas pressure
1. Rising stem or rising outside screw and yoke stems. Non-rising stem valves may be used only where headroom prevents full extension of rising stems or buried applications.
 2. Pressure and Temperature Ratings: Valves shall be selected to suit system operating pressures and temperatures.
- C. Ball Valve: Rated for shutoff duty, ASTM B584 bronze, blow out proof stem, 600 psig WOG, UL label for 250 psi gas pressure, one piece ASTM B16 brass chrome plated ball, RTFE seats and seals.
- D. Plug valve: Rated for shutoff duty, 600 psig WOG, screwed, lubricated, UL label for 175 psi working pressure, regular port or full pipe area port, ASTM A126 cast iron, Grade B, wrench operated square head.
- E. Seismic shutoff valves: Flow-through in-line type meeting FM and POS requirements - ASCE 25-97. Pressure ratings 0.5, 7.0 and 60 psi.; Pacific Seismic Products, The Little Firefighter Corporation, Quake Defense, or Affordable Safety Solutions, Inc.
- F. Pressure Reducing Valve:
1. Manufacturers: Maxitrol, Fisher, Armstrong.
 2. Self-operated with internal pressure registration, adjustable outlet pressure, 2 to 5 psig inlet pressure, 7-inch w.c. outlet pressure.

END OF SECTION