

SECTION 15496 - NATURAL GAS PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes piping, specialties, and accessories for natural gas systems within building and to gas meters.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 15 Section "Basis Mechanical Materials and Methods" for basic piping installation.
 - 2. Division 15 Section "Hangers and Supports" for pipe hanger and support devices.

1.03 DEFINITIONS

- A. Low-Pressure Natural Gas Piping: Operating pressure of 0.5 psig (14-inches wg) or less.
- B. Gas Service: Operating pressure indicated.
- C. Gas Delivery Point: Gas meter and service pressure regulator outlet.

1.04 SYSTEM PERFORMANCE REQUIREMENTS

- A. Minimum Working-Pressure Ratings: Except where otherwise indicated, minimum pressure requirements are as follows:
 - 1. Low-Pressure Natural Gas Piping: 2 psig.
- B. Approximate values of natural gas supplied for these systems are as follows:
 - 1. Heating Value: 1000 Btu/cu. ft..
 - 2. Specific Gravity: 0.6.

1.05 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of natural gas specialty and special-duty valve. Include pressure rating, rated capacity, and settings of selected models.
- C. Coordination Drawings for natural gas piping, including required clearances and relationship to other services for same work areas.
- D. Test reports specified in "Field Quality Control" Article in Part 3.
- E. Maintenance data for natural gas specialties and special-duty valves to include in the operation and maintenance manual specified in Division 1 Section "Contract Closeout."

1.06 QUALITY ASSURANCE

- A. Comply with NFPA 54, "National Fuel Gas Code," for gas piping materials and components; installations; and inspecting, testing, and purging.
- B. Product Options: Drawings indicate size, profiles, connections, dimensional requirements, and characteristics of natural gas piping equipment, specialties, and accessories and are based on specific types and models indicated. Other manufacturers' equipment and components with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Handling Flammable Liquids: Remove and legally dispose of liquids from drips in existing gas piping. Handle cautiously to avoid spillage and ignition. Notify gas supplier. Handle flammable liquids used by Installer with proper precautions and do not leave on premises from end of one day to beginning of next day.

1.08 SEQUENCING AND SCHEDULING

- A. Notification of Interruption of Service: Notify each affected user when gas supply will be turned off.
- B. Work Interruptions: Leave gas piping systems in safe condition when interruptions in work occur during repairs or alterations to existing gas piping systems.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Gas Stops, 2-Inch NPS and Smaller:
 - a. Hammond Valve Corp.
 - b. Jomar International, Ltd.
 - c. Maxitrol Co.
 - d. McDonald: A.Y. McDonald Mfg. Co.
 - e. Milwaukee Valve Co., Inc.
 - f. Mueller Co.
 - g. National Meter.
 - 2. Gas Valves, 2-Inch NPS and Smaller:
 - a. Conbraco Industries, Inc.; Apollo Div.
 - b. Core Industries, Inc.; Mueller Steam Specialty Div.
 - c. Huber: J.M. Huber Corp.; Flow Control Div.
 - d. McDonald: A.Y. McDonald Mfg. Co.
 - e. Milliken Valve Co., Inc.
 - f. Milwaukee Valve Co., Inc.
 - g. Mueller Co.
 - h. National Meter.
 - i. Nordstrom Valves, Inc.
 - j. Olson Technologies, Inc.
 - k. 3. Corrugated, Stainless-Steel Tubing Systems:
 - 1) Omega Flex, Inc.
 - 2) Titeflex Corp.
 - 3) Tru-Flex Metal Hose Corp.
 - 4) Ward Manufacturing Inc.
 - 3. PIPES AND TUBES
 - 4. Steel Pipe: ASTM A 53; Type E, electric-resistance welded or Type S, seamless; Grade B; Schedule 40; galvanized.
 - 5. PIPE AND TUBE FITTINGS
 - 6. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern, with threaded ends according to ASME B1.20.1.
 - 7. Unions: ASME B16.39, Class 150, malleable-iron with brass-to-iron seat, ground joint, and threaded ends according to ASME B1.20.1.
 - 8. Joint Compound and Tape: Suitable for natural gas.

9. JOINING MATERIALS
10. Common Joining Materials: Refer to Division 15 Section "Basic Mechanical Materials and Methods" for joining materials not included in this Section.
11. VALVES
12. Manual Valves: Conform to standards listed or, where appropriate, to ANSI Z21.15.
13. Gas Stops, 2-Inch NPS and Smaller: AGA-certified, bronze-body, plug type with bronze plug, for 2 psig or less natural gas. Include AGA stamp, flat or square head or lever handle, and threaded ends conforming to ASME B1.20.1.
 - a. Locking Device: Include locking (tamperproof) feature.
14. Gas Valves, 2-Inch NPS and Smaller: ASME B16.33, 125 psig WOG, cast-iron body, bronze plug, straightaway pattern, square head, tapered-plug type, with threaded ends conforming to ASME B1.20.1.
15. CORRUGATED, STAINLESS-STEEL TUBING SYSTEMS
16. Description: Comply with AGA LC 1 and include the following:
 - a. 1. Tubings: Corrugated stainless steel with plastic jacket or coating.
 - b. 2. Fittings: Copper alloy with ends made to fit corrugated tubing. Include ends with
 - 1) threads according to ASME B1.20.1 if connection to threaded pipe or fittings is required
 - c. 3. Striker Plates: Steel, designed to protect tubing from penetrations.
 - d. 4. Manifolds: Malleable iron or steel with protective coating. Include threaded connections
 - 1) according to ASME B1.20.1 for pipe inlet and corrugated tubing outlets.
17. PIPING SPECIALTIES
18. Flexible Connectors: ANSI Z21.24, copper alloy.

PART 3 - EXECUTION

3.01 List Level 3

- A. PREPARATION
- B. Close equipment shutoff valves before turning off gas to premises or section of piping. Perform leakage test as specified in "Field Quality Control" Article to determine that all equipment is turned off in affected piping section.
- C. Comply with NFPA 54 Paragraph "Prevention of Accidental Ignition."
- D. SERVICE ENTRANCE PIPING
- E. Extend natural gas piping and connect to gas distribution system (gas service) piping in location and size indicated for gas service entrance to building.
- F. Install shutoff valve, downstream from gas meter, outside building at gas service entrance.
- G. PIPING APPLICATIONS
- H. General: Unions, transition and special fittings, and valves with pressure ratings same as or higher than system pressure rating may be used in applications below, except where otherwise indicated.
- I. Low-Pressure, Natural Gas Systems: Use the following:

1. 1-Inch NPS and Smaller: Steel pipe, malleable-iron threaded fittings, and threaded joints.
2. VALVE APPLICATIONS
3. Use gas stops for shutoff to appliances with 1-inch NPS or smaller low-pressure gas supply.
4. Use gas valves for mainline shutoff.
5. Use gas valves of sizes indicated.
6. PIPING INSTALLATIONS
7. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping installation requirements.
8. Drips and Sediment Traps: Install drips at points where condensate may collect. Include outlets of gas meters and at appliances. Locate where readily accessible to permit cleaning and emptying.
 - a. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use minimum-length nipple of 3 pipe diameters, but not less than 3 inches long, and same size as connected pipe. Install with space between bottom of drip and floor for removal of plug or cap.
9. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.
10. Install unions in pipes 1-inch NPS and smaller, adjacent to each valve, at final connection to each piece of equipment, and elsewhere as indicated.
11. Install strainers on supply side of each control valve and elsewhere as indicated.
12. Install dielectric unions with ferrous and brass or bronze end connections, separated by insulating material, where piping of dissimilar metals is joined.
13. Install corrugated, stainless-steel tubing system according to manufacturer's written instructions. Include striker plates to protect tubing from puncture where tubing is restrained and cannot move.
14. JOINT CONSTRUCTION
15. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.
16. Use materials suitable for natural gas service.
 - a. Brazed Joints: Make joints with brazing alloy having melting point greater than 1000 deg F. Brazing alloys containing phosphorus are prohibited.
17. VALVE INSTALLATION
18. Install valves in accessible locations, protected from damage.
19. Install gas valve upstream from each appliance.
20. HANGER AND SUPPORT INSTALLATION
21. Refer to Division 15 Section "Hangers and Supports" for pipe hanger and support devices.
22. Install hangers for horizontal steel piping with the following maximum spacing and minimum rod sizes:
 - a. 1/2-Inch NPS: Maximum span, 48 inches; minimum rod size, 3/8 inch.
 - b. 3/4- and 1-Inch NPS: Maximum span, 60 inches; minimum rod size, 3/8 inch.
23. CONNECTIONS
24. Install gas piping next to appliances using gas valves or stops to allow service and maintenance.
25. Connect gas piping to appliances using gas with shutoff valves and unions. Install gas valve upstream from and within 12 inches of each appliance using gas. Install union downstream from valve. Include flexible connectors when allowed by Code.

26. Sediment Traps: Install tee fitting with capped nipple in bottom forming drip, as close as practical to inlet for appliance using gas.
27. FIELD QUALITY CONTROL
28. Inspect, test, and purge piping according to NFPA 54, Part 4 "Gas Piping Inspection, Testing, and Purging" and requirements of authorities having jurisdiction.
29. Repair leaks and defects with new materials and retest system until satisfactory results are obtained.
30. Report test results promptly and in writing to Architect and authorities having jurisdiction.
31. Verify capacities and pressure ratings of gas meters, regulators, valves, and specialties.
32. Verify correct pressure settings for pressure regulators.
33. Verify that specified piping tests are complete.
34. ADJUSTING
35. Adjust controls and safety devices. Replace damaged and malfunctioning controls and safety devices.

END OF SECTION 15496

2019