

SECTION 221523 – NATURAL GAS PIPING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Natural gas piping above grade.
2. Unions and flanges.
3. Valves.
4. Pipe hangers and supports.
5. Natural gas pressure regulators.
6. Natural gas pressure relief valves.

B. Related Sections:

1. Section 220529 - Hangers and Supports: Product requirements for pipe hangers and supports and fire stopping for placement by this section.
2. Section 220553 - Plumbing Identification: Product requirements for valve and pipe identification for placement by this section.

1.2 REFERENCES

A. American Society of Mechanical Engineers:

B. ASTM International:

C. American Welding Society:

D. American Water Works Association:

E. Manufacturers Standardization Society of the Valve and Fittings Industry:

F. National Fire Protection Association:

1. NFPA 54 - National Fuel Gas Code.
2. NFPA 58 - Liquefied Petroleum Gas Code.

G. Underwriters Laboratories Inc.:

1. UL 842 - Valves for Flammable Fluids.

1.3 SYSTEM DESCRIPTION

- A. Where more than one piping system material is specified, provide compatible system components and joints. Use non-conducting dielectric connections when joining dissimilar metals in systems.

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- B. Provide flanges, unions, or couplings at locations requiring servicing. Use unions, flanges, or couplings downstream of valves and at equipment connections. Do not use direct welded or threaded connections to valves, equipment.
- C. Provide pipe hangers and supports in accordance with ASME.
- D. Use plug, valves for shut-off and to isolate equipment, part of systems, or vertical risers.

1.4 SUBMITTALS

- A. Product Data:
 - 1. Valves: Submit manufacturers catalog information with valve data and ratings for each service.

1.5 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of valves, piping system, and system components.
- B. Operation and Maintenance Data: Submit for valves and gas pressure regulators installation instructions, spare parts lists.

1.6 QUALITY ASSURANCE

- A. Perform natural gas Work in accordance with NFPA 54.
- B. Perform Work in accordance with ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.
- C. Perform Work in accordance with applicable code, authority having jurisdiction and local gas company regulations.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years experience.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Protect piping and fittings from soil and debris with temporary end caps and closures. Maintain in place until installation. Furnish temporary protective coating on cast iron and steel valves.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Do not install underground piping when bedding is wet or frozen.

1.10 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.11 COORDINATION

- A. Coordinate trenching, excavating bedding, backfilling of buried piping systems with requirements of Section 220100.

1.12 EXTRA MATERIALS

- A. Furnish two packing kits for each type and size valve.

PART 2 PRODUCTS

2.1 NATURAL GAS PIPING, ABOVE GRADE

- A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
 - 1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M forged steel welding type.
 - 2. Joints: Threaded for pipe 2 inch (50 mm) and smaller; welded for pipe 2-1/2 inches (65 mm) and larger.

2.2 UNIONS AND FLANGES

- A. Unions for Pipe 2 inches (50 mm) and Smaller:
 - 1. Ferrous Piping: Class 150, malleable iron, threaded.
 - 2. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.
- B. Flanges for Pipe 2-1/2 inches (65 mm) and Larger:
 - 1. Ferrous Piping: Class 150, forged steel, slip-on flanges.
 - 2. Gaskets: 1/16 inch (1.6 mm) thick preformed neoprene gaskets.

2.3 PLUG VALVES

- A. Manufacturers:
 - 1. DeZURIK, Unit of SPX Corp.
 - 2. Flow Control Equipment, Inc.
 - 3. Homestead Valve
- B. 2 inches (50 mm) and Smaller: MSS SP 78, Class 150, semi-steel construction, round port, full pipe area, pressure lubricated, teflon packing, threaded ends, lever operated.
- C. 2-1/2 inches (65 mm) and Larger: MSS SP 78, Class 150, semi-steel construction, round] [square port, full pipe area, pressure lubricated, teflon packing, flanged ends. Furnish wrench-operated.

2.4 NATURAL GAS PRESSURE REGULATORS

A. Manufacturers:

1. Rockwell Gas Pressure Regulator
2. Fisher Controls Co
3. Maxatrol

B. Product Description: Spring loaded, general purpose, self-operating service regulator including internal relief type diaphragm assembly and vent valve. Diaphragm case can be rotated 360 degrees in relation to body.

1. Temperatures: minus 20 degrees F (29 degrees C) to 150 degrees F (66 degrees C).
2. Body: Cast iron.
3. Spring case, lower diaphragm casing, union ring, seat ring and disk holder: Aluminum.
4. Disk, diaphragm, and O-ring: Nitrile.
5. Maximum inlet pressure: 150 psig (1030 kPa).
6. Furnish sizes 2 inches (50 mm) and smaller with threaded ends. Furnish sizes 2-1/2 inches (65 mm) and larger with flanged ends.

2.5 UNDERGROUND PIPE MARKERS

A. Manufacturers:

1. Seton Identification Products.
2. Craftmark Identification Systems.
3. Safety Sign Co.
4. 3M Private Network Products

B. Plastic Ribbon Tape: Bright colored, continuously printed, minimum 6 inches (150 mm) wide by 4 mil (0.10 mm) thick, manufactured for direct burial service.

C. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Natural Gas Service" in large letters.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify excavations are to required grade, dry, and not over-excavated.

3.2 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.

- C. Prepare piping connections to equipment with flanges or unions.

3.3 INSTALLATION - INSERTS

- A. Provide inserts for placement in concrete forms.
- B. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe 4 inches (100 mm) and larger.
- D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- E. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

3.4 INSTALLATION - PIPE HANGERS AND SUPPORTS

- A. Install pipe hangers and supports in accordance with Section 220529.

3.5 INSTALLATION - ABOVE GROUND PIPING SYSTEMS

- A. Install natural gas piping in accordance with NFPA 54.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient.
- D. Install piping to conserve building space and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Sleeve pipe passing through partitions, walls and floors. Refer to Section 220529.
- H. Install firestopping at fire rated construction perimeters and openings containing penetrating sleeves and piping. Refer to Section 220529.
- I. Provide clearance for installation of insulation and access to valves and fittings.
- J. Provide access where valves and fittings are not exposed.
- K. Where pipe support members are welded to structural building framing, scrape, brush clean, weld, and apply one coat of zinc rich primer.
- L. Provide support for utility meters in accordance with requirements of utility company.
- M. Install vent piping from gas pressure reducing valves to outdoors and terminate in weatherproof hood.

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- N. Install identification on piping systems including underground piping. Refer to Section 220553.
 - O. Install valves with stems upright or horizontal, not inverted.
 - P. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.
 - Q. All outdoor piping shall be painted with outdoor rust proof black paint.
- 3.6 FIELD QUALITY CONTROL
- A. Pressure test natural gas piping in accordance with NFPA 54.

END OF SECTION 221523