

**SECTION 22 11 14**  
**FACILITY FUEL GAS DISTRIBUTION PIPING**

**PART 1 – GENERAL**

**1.01 WORK INCLUDED**

- A. The work shall include labor, materials, tools, equipment, transportation, insurance, temporary protection, supervision and incidental items essential for proper installation and operation, even though not specifically mentioned or indicated on the drawings but which are usually provided or are essential for proper installation of systems related to this Section, as indicated on the drawings and specified herein.
- B. The specifications and drawings describe the minimum requirements that must be met for the installation of work as shown on the drawings and as specified hereinunder.
- C. Shop drawings.
- D. Field acceptance testing.
- E. Specific work: Provide fuel gas piping, as shown on the drawings and as specified, complete.

**1.02 REFERENCES**

- A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.
  - 1. Material standards shall be as specified or detailed hereinafter and as follows:
    - a. ANSI American National Standards Institute
    - b. ASME American Society of Mechanical Engineers
    - c. AWS American Welding Society
    - d. CS Commercial Standards, U.S. Dept. of Commerce
    - e. FM Factory Mutual
    - f. FS Federal Specification, U.S. Government
    - g. MSS Manufacturers Standardization Society of the Valve and Fittings Industry
    - h. UL Underwriters Laboratories, Inc.
    - i. OSHA Occupational Safety and Health Act
    - j. ASPE American Society of Plumbing Engineers

**1.03 SUBMITTALS**

- A. Submittals – The following documents shall be provided:
  - 1. Pipe and fittings for each system.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer: Company specializing in manufacturing pipe and fitting products specified in this section, with document experience.
- B. Installer: Company specializing in performing work of the type specified in this section, with document experience.

**1.05 DELIVERY, STORAGE AND HANDLING**

- A. Accept pipe and fittings on site in shipping containers with labeling in place. Inspect for damage.

**PART 2 – PRODUCTS**

**2.01 PIPING, FITTINGS AND JOINTS**

- A. Polyethylene Natural Gas Pipe and Fittings
  - 1. Buried Natural Gas Piping
    - a. Polyethylene, SDR-11, ASTM D2513 pipe and fittings with heat fusion socket joints and shall be rated for intermediate pressure gas (greater than 20 PSI).
    - b. Polyethylene pipe and fitting materials shall be compatible and by same manufacturer to ensure uniform melting and a proper bond. Fabricated fittings shall not be used.

- c. Provide connection between buried plastic gas service piping and metallic riser in accordance with the gas code. Provide metallic riser consisting of HDPE-fused coating on steel pipe for connection to above ground building distribution piping. Underground horizontal metallic portion of riser shall be at least 24 inches in length before connecting to the plastic service pipe. An approved transition fitting or adaptor meeting design pressure rating and plastic pipe manufacturer's recommendations shall be used where the plastic joins the metallic riser.
2. Provide minimum 3 inch wide polyethylene detectable type marking tape above piping. The tape shall be resistant to alkalis, acids and other destructive agents found in soil and impregnated with metal so that it can be readily recognized after burial by standard locating equipment.
  - a. Lamination bond of one (1) layer of minimum 0.35 mils thick aluminum foil between two (2) layers of minimum 4.3 mils thick inert plastic film.
  - b. Minimum tensile strength: 63 lbs. per 3 in. width.
  - c. Minimum elongation: 500 percent.
  - d. Provide continuous yellow with black letter printed message repeated every 16 to 36 inches warning of pipe buried below (e.g.: "CAUTION GAS LINE BURED BELOW").
  - e. Manufactured by Reef Industries "Terra Tape" or approved equal.

### **PART 3 – EXECUTION**

#### **3.01 EXAMINATION / PREPARATION**

- A. Inspect site conditions in areas where piping and equipment will be installed and verify the impact of the installation before fabricating systems to be installed.

#### **3.02 NATURAL GAS TESTING**

- A. All gas piping shall be tested in accordance with NFPA-54 latest edition.
- B. Prior to acceptance and initial operation, all piping installations shall be inspected and pressure tested to determine that the materials, design, fabrication, and installation practices comply with the requirements of this code.
- C. Where repairs or additions are made following the pressure test, the affected piping shall be tested. Minor repairs and additions are not required to be pressure tested provided that the work is inspected and connections are tested with a noncorrosive leak-detecting fluid or other leak-detecting methods approved by the authority having jurisdiction.
- D. The test medium shall be air, nitrogen, carbon dioxide, or an inert gas.
- E. Pipe joints, including welds, shall be left exposed for examination during the test. Appliances and equipment that are not to be included in the test shall be either disconnected from the piping or isolated by blanks, blind flanges, or caps. Flanged joints at which blinds are inserted to blank off other equipment during the test shall not be required to be tested.
- F. Where the piping system is connected to appliances, equipment, or equipment components designed for operating pressures of less than the test pressure, such appliances, equipment, or equipment components shall be isolated from the piping system by disconnecting them and capping the outlet(s).
- G. Test pressure shall be measured with a manometer or with a pressure measuring device designed and calibrated to read, record, or indicate a pressure loss due to leakage during the pressure test period. The source of pressure shall be isolated before the pressure tests are made. Mechanical gauges used to measure test pressures shall have a range such that the highest end of the scale is not greater than 5 times the test pressure. The test pressure to be used shall be no less than 1½ times the proposed maximum working pressure, but not less than 3 psi (20 kPa), irrespective of design pressure. Test duration shall be not less than ½ hour for each 500 ft<sup>3</sup> (14 m<sup>3</sup>) of pipe volume or fraction thereof. The duration of the test shall not be required to exceed 24 hours. The piping system shall withstand the test pressure specified without showing any evidence of leakage or other defects. Any reduction of test pressures as indicated by pressure gauges shall be deemed to indicate the presence of a leak unless such reduction can be readily attributed to some other cause.

- H. The leakage shall be located by means of an approved gas detector, a noncorrosive leak detection fluid, or other approved leak detection methods. Matches, candles, open flames, or other methods that provide a source of ignition shall not be used
- I. Where leakage or other defects are located, the affected portion of the piping system shall be repaired or replaced and retested.
- J. Gas utilization equipment shall not be placed in operation until after the piping system has been tested and purged.
- K. When piping is placed in operation, the air or inert gas in the piping shall be displaced with fuel gas. The air can be safely displaced with fuel gas provided that a moderately rapid and continuous flow of fuel gas is introduced at one end of the line and air is vented out at the other end. The fuel gas flow shall be continued without interruption until the vented gas is free of air. The point of discharge shall not be left unattended during purging. After purging, the vent shall then be closed.
- L. The open end of piping systems being purged shall not discharge into confined spaces or areas where there are sources of ignition unless precautions are taken to perform this operation in a safe manner by ventilation of the space, control of purging rate, and elimination of all hazardous conditions.

**END OF SECTION**