

SECTION 33 51 13
GAS PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pipe and fittings for site utility natural or propane gas distribution
- B. Propane storage tanks

1.2 REFERENCES

- A. AASHTO T180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in) Drop
- B. ASME B16.3 - Malleable Iron Threaded Fittings
- C. ASME B16.11 - Forged Fittings, Socket Welding and Threaded
- D. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings
- E. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
- F. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes
- G. ASME B31.8 - Gas Transmission and Distribution Piping Systems
- H. ASME Boiler and Pressure Code
 - 1. ASME SEC. VIII - Pressure Vessels
 - 2. ASME SEC. IX - Welding and Brazing Qualifications
- I. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
- J. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
- K. ASTM B32 - Standard Specification for Solder Metal
- L. ASTM B75/B75M - Standard Specification for Seamless Copper Tube
- M. ASTM B88 - Standard Specification for Seamless Copper Water Tube
- N. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft³ (600 kN-m/m³))
- O. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft³ (2,700 kN-m/m³))
- P. ASTM D2513 - Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings
- Q. ASTM D2517 - Standard Specification for Reinforced Epoxy Resin Gas Pressure Pipe and Fittings
- R. ASTM D2683 - Standard Specification for Socket Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing
- S. ASTM D2837 - Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products
- T. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
- U. ASTM D3261 - Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
- V. ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
- W. ASTM F1055 - Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Crosslinked Polyethylene (PEX) Pipe and Tubing
- X. AWS A5.8/A8.5M, Specification for Filler Metals for Brazing and Braze Welding
- Y. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems
- Z. NFPA 54 - National Fuel Gas Code

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AA. NFPA 58 - Liquefied Petroleum Gas Code

BB. FBCFG - Florida Building Code Fuel Gas

1.3 SUBMITTALS FOR REVIEW

A. Section 01 33 00 – Submittals Procedures, procedures for submittals

B. Product Data: Provide data on pipe materials, pipefittings, valves, and accessories.

1.4 SUBMITTALS FOR INFORMATION

A. Section 01 33 00 - Submittals Procedures, procedures for submittals.

B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.5 SUBMITTALS AT PROJECT CLOSEOUT

A. Section 01 77 00 - Contract Closeout, Procedures for submittals.

B. Record actual locations of pipe mains, valves, connections, and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with Owner, utility company, or municipality as required.

B. Welding Materials and Procedures: Conform to ASME Boiler and Pressure Vessel Code and applicable state regulations.

C. Welders Certification: In accordance with ASME Sec. IX

D. Conform to NFPA 58

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products to site under provisions of Section 01 60 00.

B. Deliver and store valves in shipping containers with labeling in place.

PART 2 PRODUCTS

2.1 PIPE

A. Steel Pipe Below Ground: ASTM A53/A53M, Schedule 40 black:

1. Fittings: ASME B16.11, forged steel, or ASTM forged steel welding type.

2. Joints: Welded

3. Jackets: AWWA C105 polyethylene jacket, 10-mil polyethylene type,

4. See FBC-Fuel Gas for protective coating requirements.

B. Steel Pipe Above Ground: ASTM A53/A53M, Schedule 40 black:

1. Fittings: ASME B16.3, malleable iron, ASME B16.11, forged steel, or ASTM A234/A234M, forged steel welding type.

C. Plastic Tubing: ASTM D2513 Thermoplastic Gas Pressure Tubing

1. Fittings: ASTM 3350 Polyethylene

2. Joints: ASTM D2683, Specification for Socket-type Polyethylene (PE) Fittings for Outside Diameter Controlled Polyethylene Pipe; or ASTM D3261, Specification for Butt Heat Fusion Polyethylene (PE) Plastic Pipe and Tubing ; or ASTM F1055, Specification for Electrofusion Type Polyethylene Fittings

2.2 GAS COCKS

A. Up to 2": 150 psig WOG, bronze body, bronze tapered plug, non-lubricated, Teflon packing, threaded ends with cast iron curb box, cover, and key.

B. Over 2": 125 psig WOG, cast iron body and tapered plug, non-lubricated, Teflon packing, threaded ends, with cast iron curb box, cover, and key.

C. Gas Cock and Pressure Regulating Valves: Manufacturer's name and pressure rating marked on valve body.

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2.3 PRESSURE REGULATING VALVES

- A. Valves: Single stage, malleable iron body, corrosion-resistant, pressure regulator with atmospheric vent elevation compensator threaded ends for 2" and smaller, flanged ends larger than 2".
- B. Capacity: For inlet and outlet gas pressures, specific gravity, and flow rate indicated.

2.4 PROPANE STORAGE TANKS

- A. Construction: NFPA 58, closed, welded steel, tested and stamped in accordance with ASME Section 8D; minimum 250 psig rating; cleaned, prime coated with one coat of rust inhibitive paint and two coats of high gloss enamel; supplied with steel support saddles, pressure gage; tapping for installation of piping and accessories.

2.5 BEDDING AND COVER MATERIALS

- A. Bedding: Fill as specified in Section 02200.
- B. Cover: Fill as specified in Section 02200.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions under provisions of Section 01 31 00.
- B. Verify that building service connection and utility gas main size, location and invert are as indicated.

3.2 PREPARATION

- A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.
- B. Bevel plain end ferrous pipe over 2" diameter, thread ferrous pipe 2" diameter and under.
- C. Remove all scale and dirt from the inside and outside of the pipe before assembly.
- D. Prepare piping connections with threading and unions.

3.3 BEDDING

- A. Excavate pipe trench in accordance with Section 31 20 00 for work of this section, and if necessary hand trim excavation for accurate placement of pipe to elevations indicated.
- B. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 8" compacted depth, compact to 98%.
- C. Backfill around sides and to top of pipe with cover fill tamped in place and compacted to 98%.
- D. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 INSTALLATION - PIPING

- A. Maintain separation of gas line from sewer and water piping in accordance with code.
- B. Route the piping in a straight line.
- C. Install piping to conserve space and not interfere with use of site space.
- D. Install piping to allow for expansion and contraction without stressing pipe or joints.
- E. Install cocks and other fittings.
- F. Establish elevations of buried piping to ensure not less than 36" of cover in non-traveled areas and 48" of cover in driveways and parking areas.
- G. Lay pipe on bedding.
- H. Install locator wire and warning markers along with all plastic pipe used to carry any type of fuel gas.
 - 1. Locator wire shall be single or multi-strand copper and insulated with a yellow high molecular weight jacket having a minimum thickness of 30 mils.
 - 2. Install a locator wire in the same trench as the pipe approximately 6" over the pipe crown.

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3. Locator wire shall be looped or terminated at all warning markers and be accessible for attachment of impressed radio signal locating devices by removing a cap or access port located near the warning marker.
 4. Warning markers shall be provided at all points where the pipeline changes direction, at intervals not exceeding 1,000 feet, at all locations where the gas pipe enters School District Property, and at all locations where the gas pipe enters a building.
 5. Warning markers shall be embedded at least 36" into the ground and terminate between 12" and 36" above the ground unless within the limits of a sport field.
 - a. Other provisions will be made within sport field limits.
 6. Warning markers shall be yellow and purchased from a company regularly engaged in the manufacture of utility line markers.
 - I. Wrap couplings and fittings of steel pipe with polyethylene tape and heat shrink over pipe.
 - J. Backfill the trench in accordance with Section 31 20 00
 - K. Center and plumb valve box over valve, then set box cover flush with finished ground surface.
 1. Carefully install to prevent transmitting shock or stress through valve box to valve.
 - L. Wrap valve and valve box with polyethylene tape and heat shrink.
 - M. Paint all above ground and above ceiling piping yellow and labeled.
- 3.5 SERVICE CONNECTIONS
- A. Provide sleeve in foundation wall for gas service main. Seal enlarged sleeve watertight.
 - B. Anchor service main to exterior surface of foundation wall.
 - C. Install service regulator adjacent to building wall in specified location.
 - D. Install service regulator and riser pipe to prevent undue stress upon service pipe.
 - E. Provide regulator vent with rain and insect proof opening, terminating away from building openings.
 - F. Provide bollards, fence, or other suitable protection for all above ground piping meters, and appurtenances.
 1. Contractor installing the piping, meter, or appurtenance shall install protection.
- 3.6 PROPANE TANK INSTALLATION
- A. Install tank below grade in accordance with the plans and District guidelines / details. The more stringent condition shall govern in case of conflicting instructions.
 - B. Provide tank with relief valve, shutoff valve, pressure regulator, pressure gage, and removable protection cover. Install piping, shutoff valve, and pressure gage to underground piping.
- 3.7 FIELD QUALITY CONTROL
- A. Section 01 40 00 - Quality Control, field inspection and testing.
 - B. Perform compaction testing in accordance with ASTM D1557.
 - C. Gas lines will be pressure tested.
 - D. If tests indicate, work does not meet specified requirements, remove work, replace, and retest at no cost to Owner.

END OF SECTION