

**SECTION 33 51 00
NATURAL-GAS DISTRIBUTION**

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section covers supplying all labor, equipment, materials and appliances and performing all other procedures necessary for the replacement of outside underground gas distribution system for natural gas, complete, ready for operation, including connections to building structures and to gas supply. The distribution system includes the distribution mains, valves, pipeline markers, service valves, service regulators, and meters.

1.2 RELATED WORK

A. Excavation, Trench Widths, Pipe Bedding, Backfill, Shoring, Sheeting, Bracing: Section 31 20 11, EARTH MOVING.

1.3 DEFINITIONS

A. Gas Service Line: A distribution line that transports gas from a utility source of supply to the meter set assembly.

1.4 QUALITY ASSURANCE

A. Comply with rules and regulations of the local utility having jurisdiction in all cases where gas lines are connected to public utility services.

1.5 SUBMITTALS

- A. Submit for approval, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Piping:
 - 1. ASTM Compliance.
 - 2. Grade, class or type, schedule number.
 - 3. Manufacturer's Certification of Compliance with specified standards.
- C. Manual Valves:
 - 1. Type and service.
 - 2. Catalog Cuts.
 - 3. Pressure and Temperature Ratings.
- D. Valve Boxes:
 - 1. Catalog Cuts.
- E. Gas Pressure Regulator:
 - 1. UL Listing.
 - 2. Pressure and Temperature Rating.
 - 3. Flow Capacities.
 - 4. Catalog Cuts.

1.6 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American National Standards Institute (ANSI):
B31.8-2007Gas Transmission and Distribution Piping Systems
- C. American Petroleum Institute (API):
API Spec 6D-2006Pipeline Valves (Gate, Plug, Ball, and Check Valves)
- D. American Society for Testing and Materials (ASTM):
D2513-09Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings
D3350-08Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
- E. National Fire Protection Association (NFPA):
54-2009National Fuel Gas Code

PART 2 - PRODUCTS

2.1 PIPE

- A. Polyethylene Pipe: Pipe and tubing shall conform to ASTM D3350 AND ASTM D2513, pipe designations PE 2406 and PE 3408. Minimum wall thickness shall conform to ANSI B31.8. PE pipe is for underground use only. Polyethylene pipe shall be marked "GAS" and it is not be used where gas pressures are above 690 kPa (100 psi) or with operating temperatures below 7 degrees C (20 degrees F) or above 60 degrees C (140 degrees F).

2.2 FITTINGS

- A. Polyethylene Plastic Pipe Fittings: ASTM D2513.

2.3 JOINTS

- A. Polyethylene pipe joints shall be heat fusion, either butt fusion or socket fusion.

2.4 VALVES

- A. All types of valves shall be accessible, labeled and specified for use for controlling multiple systems.
- B. Manual: Valves shall be suitable for shutoff or isolation service.
 - 1. Lubricated plug type for gas service shall be cast iron, semi-steel or cast steel. Valves shall have capacity to operate in lines with 690 kPa (100 psi) working pressure. Steel valves 40 mm (1-1/2 inches) and smaller installed underground and shall conform to ASME B16.34, carbon steel, socket weld ends. Steel valves 40 mm (1-1/2 inches) and smaller, installed above ground, shall conform to ASME B16.34, carbon steel, socket weld or threaded ends. Steel valves 50 mm (2 inches) and larger shall conform to API spec 6D, carbon steel, buttweld ends,

for underground installations. Above ground steel valves 50 mm (2 inches or larger) shall conform to API Spec 6D, carbon steel, buttweld or flanged ends.

- a. Underground: 50 mm (2 inch) nut for socket wrench operation.
- b. Above Ground and In Pits: Lever operation, locking type. Provide one lever for each valve.

C. Polyethylene Valves:

1. Valves shall conform to ASME B16.40. Polyethylene valves, in sizes 15 mm to 150 mm (1/2 inch to 6 inches) may be used with polyethylene distribution and service lines, in lieu of steel valves, for underground installation only.

2.5 VALVE BOXES

- A. Cast iron extension box with screw or slide type adjustment and flared base. Minimum thickness of metal, 5 mm (3/16 inch). Box shall be of such length as can be adapted, without full extension, to depth of cover required over pipe at valve location.
- B. Cast the word "GAS" in cover.
- C. Provide box with heavy coat of bituminous paint.

2.6 PIPE SLEEVES

- A. Ductile iron or coated steel.

2.7 GAS PRESSURE REGULATORS

- A. Pressure regulators for individual service lines shall be capable of reducing distribution line pressure to pressures required for users. Pressure relief shall be set at a lower pressure than would cause unsafe operation of any connected user. Gas valve shall be installed immediately upstream of each pressure regulator and regulator shall have a single port with orifice diameter no greater than that recommended by manufacturer for the maximum gas pressure at the regulator inlet. Regulator vent valve shall be of resilient materials designed to withstand flow conditions when pressed against valve port. Regulator shall be capable of limiting build-up of pressure under no-flow conditions to 50 percent or less of the discharge pressure maintained under flow conditions. Contractor shall demonstrate to COR that the regulator does not leak at final inspection.

2.8 METERS

- A. Gas meters shall be furnished and installed by local gas Utility of type approved by local gas Utility.

2.9 WARNING TAPE

- A. Standard, 4-Mil polyethylene 76 mm (3 inch) wide tape, non-detectable type, yellow with black letters, and imprinted with "CAUTION BURIED GAS LINE BELOW".

PART 3 - EXECUTION

3.1 GAS MAINS

- A. Pipe for gas service lines shall be polyethylene. Polyethylene mains shall not be installed above ground.

3.2 BUILDING SERVICE LINES

- A. Install gas service lines to point of connection outside of buildings to which such service is to be connected and make connections thereto. The point of delivery is the meter set assembly.

3.3 PIPE INSTALLATION, GENERAL

- A. Gas distribution system and equipment shall be installed in accordance with the manufacturer's recommendations and applicable sections of B31.8 and NFPA 54.
- B. Excavation and backfilling shall be as specified in Section 31 20 11, EARTH MOVING.
- C. Storm and sanitary sewer lines, and water mains shall have right of way.
- D. Warning tape shall be continuously placed 300 mm (12 inches) above buried gas lines.
- E. Before entering building, underground service line shall rise above grade close to building.
- F. Service lines shall have a 450 mm (18 inch) minimum cover of 18 inches or as recommended by local utility.
- G. Connections between metallic and plastic piping shall be made only outside, underground, and with approved transition fittings.

3.4 NON-METALLIC PIPE INSTALLATION

- A. Install pipe in trench in accordance with recommendations of the pipe manufacturer. Provide sufficient slack to allow for expansion and contraction.
- B. Joints: Fusion welds shall be made in accordance with the recommendations of the polyethylene pipe manufacturer.
- C. All offsets in piping shall be made with manufactured fittings. Bending of piping to form offsets shall not be permitted.
- D. Connections between plastic pipe and metal pipe shall be made in accordance with recommendations of the pipe manufacturer.
- E. Copper Tracer Wire: Copper tracer wires consisting of No. 14 AWG solid, single conductor, insulated copper wire shall be installed in the trench with all piping to permit location of the pipe with electronic detectors. The wire shall not be spiraled around the pipe nor taped to

the pipe. Wire connections are to be made by stripping the insulation from the wire and soldering with rosin core solder. Solder joints shall be wrapped with rubber tape and electrical tape. At least every 300 m (1000 feet), provide a 2.3 kg (5 pound) magnesium anode attached to the main tracer wire by solder joint shall be wrapped with rubber tape and with electrical tape. An anode shall be attached at the end of each line.

3.5 SETTING VALVES

- A. Do not install valves under pavement.
- B. Clean valve interior before installation.

3.6 VALVE BOXES

- A. Set cover flush with finished grade.
- B. Protect boxes located in roadway against movement by a concrete slab at least 900 mm (3 foot) square by 150 mm (6 inches) deep.
- C. Set other valve boxes with a concrete slab 450 mm (18 inches) by 450 mm (18 inches) by 150 mm (6 inches) deep and set flush with grade.
- D. All exposed portions of valve boxes shall be painted "Traffic Yellow."

3.7 PIPE SLEEVES

- A. Pipe shall be continuous through sleeves.

3.8 PRESSURE REGULATOR AND METER INSTALLATION

- A. Pressure regulator and meter installation shall be installed per manufacturer's recommendations and per NFPA 54.

3.9 TESTS

- A. Piping System: Inspection, testing and purging shall be in accordance with NFPA 54.

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