

SECTION 33 50 00
NATURAL GAS DISTRIBUTION PIPING
Construction Specification

PART 1 GENERAL

1.1 SUMMARY

- A. This section describes general requirements, products, and methods of execution relating to on-site natural gas piping serving all buildings and structures. Unless otherwise noted, this section does not apply to natural gas systems, equipment and appurtenances, inside and within 5 feet of buildings.
- B. Contractor shall provide all labor, equipment, materials, and testing services unless otherwise noted.
- C. Related Sections:
 - 1. Section 31 20 00 – EARTH MOVING.

1.2 SUBMITTALS

- A. Comply with requirements of Section SUBMITTAL PROCEDURES.
- B. Product Data: Manufacturer's literature and data, including, where applicable, sizes, pressure rating, rated capacity, listing/approval stamps, labels, or other markings made to the specified standards, for the following:
 - 1. Piping and fittings.
 - 2. Gaskets, couplings, sleeves, and assembly bolts and nuts.
 - 3. Gate valves and ball valves.
 - 4. Valve boxes, frames and covers.
 - 5. Meter boxes, frames and covers.
 - 6. Tapping sleeves and tapping valves.
 - 7. Service saddles and corporation stops.
 - 8. Identification materials and devices.
- C. Shop Plans and Calculations: None required.
- D. Test Reports: Provide as necessary.

1.3 QUALITY ASSURANCE

- A. Comply with the latest edition of the following Standards and Regulations:
 - 1. Pacific Gas & Electric Company Standard Specifications and Plans.
 - 2. State of California Public Utilities Commission Requirements.
 - 3. American Society of Testing and Materials (ASTM).

- a. ASTM D2513 Thermoplastic Gas Pressure Pipe, Tubing and Fittings.
 - b. ASTM D2683 Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing.
 - c. ASTM D3139 Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
 - d. ASTM D3261 Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
 - e. ASTM D3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
 - f. ASTM F477 Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
 - g. ASTM F1055 Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing.
 - h. ASTM F1056 Standard Specification for Socket Fusion Tools for Use in Socket Fusion Joining Polyethylene Pipe or Tubing and Fittings.
 - i. ASTM A53/A53M Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - j. ASTM A795 Standard Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use.
 - k. ASTM A865 Standard Specification for Threaded Couplings, Steel, Black or Zinc-Coated (Galvanized) Welded or Seamless, for Use in Steel Pipe Joints.
 - l. ASTM B88 Standard Specification for Seamless Copper Water Tube.
4. Plastics Pipe Institute (PPI)
 - a. Underground Installation of Polyethylene Pipe.
 - b. Polyethylene Joining Procedures.
 - c. Inspections, Test and Safety Considerations.
 5. American Association of State Highway and Transportation Officials (AASHTO) for H2O Loading
 6. American Concrete Institute (ACI)
 - a. ACI 348 - Meter Pit Construction
 7. Other authorities having jurisdiction.
- B. System Description: Grades and elevations are to be established with benchmarks referenced on Plans.
- C. All testing of systems specified in this section shall be witnessed by representatives of the inspector or local authority. Provide at least 7 days notice.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Piping:
 - 1. Schedule 40 steel pipes, with malleable iron fittings.
 - a. Maximum service pressure of pipe shall be 125 psi.
 - b. Maximum service temperature of pipe shall be 250 degrees F.
 - c. Provide Teflon® tape pipe joint compound as sealant on all pipe threads.
 - 2. Polyethylene 2406 piping, with PE fittings.
- B. Protective Coating for Underground Steel Pipe: Provide extruded polyethylene sheath, manufactured by Amstead "Plexco."
 - 1. Provide yellow color Federal Specification L-C-530.
 - 2. Provide sealed fittings and couplings sealed using heat-cured sheath shrunk in place, Raychem "Thermofit" sleeves.
- C. Provide shutoff valve at the point of connection where the new gas service connects to the existing underground service stub.
- D. Valve Box: For each valve, provide concrete boxes as specified in Division 22. Cover shall be identified in letters reading "Gas".
- E. Valves: Provide UL approved and listed ball valves with threaded ends and level handle.
 - 1. Acceptable manufacturers: Worcester "Econo-Miser" or Hills-McCanna.
 - 2. Equivalent products will be considered when submitted in accordance with "Substitutions" as specified in Section 01600 - PRODUCT REQUIREMENTS.
- F. Provide 2-inch wide yellow warning tape reading "Caution Medium Pressure Gas Buried Below".

2.2 MATERIALS

- A. Polyethylene (PE) Pipe: All plastic pipe installed shall be medium density PE 2406 TR418 "GAS" pipe manufactured in accordance with the latest listed edition of ASTM D2513. All pipes will be supplied in straight 40 feet lengths. All PE-to-PE connections shall be Butt Fusion Type made in the presence of a qualified inspector.
- B. Polyethylene (PE) Fittings: All plastic fittings shall be medium density PE 2406, TR-418 "GAS" fittings manufactured in accordance with the latest listed edition of ASTM D2513 and ASTM D-3261. All fittings shall have Butt End outlets.
- C. Polyethylene (PE) Valves: All plastic valves shall be medium density PE 2406, TR-418 "GAS" valves manufactured in accordance with the latest listed edition of ASTM D-2513 and ASTM D-3261. All valves shall have Butt End outlets.
- D. Pipe Scratches or Cuts: Pipe that has scratches, notches, cuts or any other abrasions that exceed 10% of the pipe wall thickness shall not be used on the project and shall be disposed

of. The Contractor shall inspect all pipes and reject any pipe that has scratches exceeding 10% of the pipe wall thickness. The Contractor will be responsible for the cost of all defective or damaged pipe that he accepts, costs will be deducted from payments. The Contractor shall use pipe stands, spooling devices, or other means to avoid damaging the pipe during installation. The Contractor shall observe the pipe during installation for scratches, gouges or other defects. If defects are present, the Contractor shall remove and discard the damaged section of pipe.

- E. Minimum Bending Radius: The minimum bend radius for plastic pipe is twenty times the outer diameter. The Contractor shall not bend plastic pipe to a radius less than twenty times the outside diameter of the pipe. Fittings shall not be installed in pipe that is bent or curved to conform to trench dimensions.
- F. Tracer Wire: Tracer wire shall be attached to the pipe with all non-metallic electric tape at intervals not exceeding 3 feet. All connections between tracer wires shall be made with the split bolt connectors and wrapped with electric tape. See Section 02315 for specifications of tracer wire.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine surfaces of site and work area for suitable conditions where gas service is to be installed.
- B. Do not begin installation until unsatisfactory conditions have been corrected.

3.2 ABANDONMENT OF EXISTING UNDERGROUND PIPE

- A. Existing gas pipe to be abandoned in place shall be capped at each end, evacuated of all natural gas, pressure tested per section 2.4B, and pressurized with nitrogen gas to a pressure not less than 5 PSIG.

3.3 INSTALLATION

- A. Provide protective covers having an extruded polyvinyl chloride outer coating for underground Steel pipe and fittings.
 - 1. Provide "Thermofit" fitting sleeves shrunk in place over joints and fittings after welding and testing of piping.
 - 2. As an option, provide 2-layer wrap of 3M No. 53, 10-mil thickness tape.
- B. Depth of Cover for Underground Piping: 2-foot, 6-inches minimum from finish grade.
- C. Trench width to be 12 inch minimum.
- D. Trench back fill and compaction shall meet PG&E requirements.
- E. Provide Underground warning tape for all gas service and main pipeline installations.
- F. Sand Encasement:
 - 1. For protective-coated pipe, provide 3-inch minimum thickness of clean, washed and graded building sand.
 - 2. Apply after all coatings have been finished.

- G. Installation shall conform to ANSI B31.8.
- H. Location of Service Piping: Service pipe shall enter building wall in areaway or above ground.

3.4 FIELD QUALITY CONTROL

- A. Blowing Out Piping:
 - 1. Blow out piping with air immediately prior to pressure testing.
 - 2. The flow shall be a velocity of at least 100 feet per second.
 - 3. Blow out piping for at least 20 minutes and continue until the effluent is clear and contains no visible particulate matter.
- B. Field Tests:
 - 1. Tests shall conform to requirements in ANSI B31.8; conduct tests prior to backfilling.
 - 2. Air pressure test shall be at a pressure of 100 psig, duration 30 minutes minimum.
 - 3. The Inspector of Record shall witness all field tests.
 - 4. Conduct tests, providing labor, equipment and incidentals required for testing. If any failure occurs during testing, provide replacements as directed by the Project Manager and repeat tests until satisfactory installation and operation are achieved.
- C. May conduct and provide report of 12,000V Tinker Riser Test.

END OF SECTION