

STANDARD SPECIFICATIONS FOR
CONSTRUCTING GAS FACILITIES

DIVISION III – CONSTRUCTION SPECIFICATIONS

SECTION 8

GENERAL SPECIFICATIONS FOR GAS MAINS

8.01 GENERAL

All gas main work shall conform to the applicable requirements of the U.S. Department of Transportation, Part 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, most recent edition. Any Contractor employee who will perform gas work shall meet the “Qualifications of Pipeline Personnel - Subpart N”. Contractor’s employees who fuse plastic pipe shall be certified in fusion approved by Alabama Public Service Commission Office of Pipeline Safety. Contractor’s employees who connect to hot gas mains or install live taps shall be qualified in that covered task per the Utilities Board of the City of Daphne Operator Qualification Program. (Ref: Energyworld.net, Computer based training and hands on training.) Documentation of compliance of these requirements shall be provided to the Utilities Board of the City of Daphne.

8.02 SCOPE

This Specification covers the design, fabrication, installation and testing of gas transmission lines and distribution systems, including gas pipelines, gas mains and service lines up to the outlet of the customer’s meter set assembly.

8.03 MATERIALS AND EQUIPMENT

A. Distribution & Air Piping: This subsection shall be deleted and replaced with the following:

1. Steel pipe shall be standard weight pressure pipe conforming to API-5L Grade “B”/ANSI Specifications B36.10 and B36.19, welded pipe.
2. Polyethylene gas pipe shall be used. The pipe shall be PE 2406, SDR 11 with P24BC Medium Density resin or a PE 3408, SDR 11 with High Density Resin as specified within ASTM D2513. Fittings shall be the resin and made by the same manufacturers as the pipe. The pipe shall meet the following conditions:

<u>PROPERTY</u>	<u>ASTM TEST</u>	<u>VALUE</u>
Density, gpm/cc	D1505	0.957
Melt Flow, gms/10 min.	D1238	1.5
Environmental Stress Crack	D1693	75000
Cell Classification	D3350	355434C

Piping shall meet the Public Service Commission Office of Pipeline Safety in Alabama and be approved by them for installation in Alabama. Shipping lengths of pipe shall be assembled into one continuous length at the job site by thermal butt-fusion. Fusion machine and fusion machine operator shall be approved by the pipe manufacturer. The resultant joint shall be as strong as the intervening lengths.

Joining of pipe and installation of outlets shall be in accordance with the pipe manufacturer's written recommendations. The pipe supplier shall certify in writing that the Contractor is qualified to join, lay, and pull the pipe or a trained representative of the pipe manufacturer shall be on site to oversee the pipe joining and the installation of outlets or other items. Expenses for the representative shall be paid for by the Contractor.

Installation of polyethylene pipe in areas where flotation is probable whether on land or a subaqueous location installation shall conform with the manufacturer's recommendation.

Polyethylene pipe shall not be crimped in any way during construction. Fabricated polyethylene bends shall be manufactured by pipe manufacturer. SDR of fabricated polyethylene bends shall be equal to SDR of connecting pipe. Deflection of polyethylene pipe after installation and backfilling shall not exceed five (5) percent.

C. Gas Compressor, Metering and Regulating Station Piping

1. Piping with a 2-inch diameter and smaller shall be standard weight, carbon steel, square cut, seamless API-5L, Grade A125, butt weld in accordance with ANSI Specifications B36.10 and B36.19, latest edition.
2. Piping with a 2½-inch diameter and larger shall be standard weight, carbon steel bevel cut, seamless, API-5L, Grade "B" in accordance with ANSI Specifications B36.10 and B36.19, latest edition.

D. Coating and Wrapping of Underground Steel Piping

The exterior surfaces of all piping, fittings and valves shall be coated, wrapped and installed in accordance with AWWA Specification C203, latest edition. The wrapping on each end shall be legibly marked by rolling, stamping or stenciling to show the type of pipe, pipe specification and pipe manufacturer in accordance with APSC and DOT requirements.

1. Shop coated piping shall be in accordance with AWWA Specification C203, latest edition.
2. Field Coating - Pipe connections, fittings, valves and short runs of pipe shall be field wrapped as follows: All surfaces to be wrapped shall be clean, dry and free of all oil and grease. Surface shall be primed and 4-inch wide wrapping shall be applied. Primer shall be TC Primecoat by Tapecoat Company, Inc., or approved equal. Wrapping shall be Tapecoat 20 by Tapecoat Company, Inc., or equal. Application of priming and wrapping shall be in strict accordance with manufacturer's recommendations.

E. Fittings for Distribution and Service Piping

Elbows, tees, reductions, caps, shaped nipples, etc., shall be standard weight in accordance with ANSI B16.9, latest edition, Specification of "Steel Butt Welded Fittings" and DOT 192.149 "Standard Fittings."

F. Fittings for Gas Compressors, Metering and Regulating Piping

Elbows, tees, reductions, caps, unions, etc., shall be standard weight, forged steel, butt weld in accordance with ANSI B16.9, latest edition. Unions shall be ground joint, steel to steel seat.

G. Flanges

1. Pipe 2 inches and smaller shall be Class 300, forged carbon steel, raised face, weld neck.
2. Pipe 2½ inches and larger shall be Class 300, forged carbon steel, raised face. Weld neck flanges may be used at butt weld fittings. Flanges shall have a working pressure of 740 psi at 100°F - 505 psi at 750°F in accordance with ANSI Specification B16.5, latest edition, MSS SP-44 or Owner/Engineer approved equal.
3. Each flange on a flanged joint in cast iron pipe must conform in dimensions, drilling, face and gasket design to ASME/ANSI B16.1 and be cast integrally with the pipe, valve, or fitting.

H. Bolting

All bolts shall be American Standard Stud Bolts in accordance with ASTM Specification 307 Grade B, with semi-finished heavy hex nuts.

I. Gaskets

Flanged gaskets shall be 1/16 inches thick, composition type by Cranite Company, or equal, conforming to ASME/ANSI B16.1.

J. Valves

1. General - Except for cast iron and plastic valves, each valve must meet the minimum requirements of API 6D. All buried valves shall be coated and wrapped. Valves which are installed deeper than 3 feet below finish grade shall have the operating stem (including lubrication fitting) extended to within 2 feet of finish grade but not less than 1 foot of finish grade, and terminated with a 2-inch square operating head. Extension stems shall be the same diameter as the valve stem unless otherwise specified and shall be a standard manufactured item to be approved prior to installation.
2. Valves 2 Inches and Smaller - Valves shall be lubricated ball valve-type plug valves, 500 pounds WOG, 1,000 pounds. Test with threaded ends, semi-steel body, coated plug, wrench operated, as manufactured by Nordstrom/Rockwell, Figure 524, or Engineer / Owner approved equal.

3. Valves 1 Inch Through 4 Inches - Valves shall be lubricated ball valve-type plug valves, 500 pounds WOG, 1,000 pounds test, with flanged ends, semi-steel body, coated plug, wrench operated, as manufactured by Nordstrom/Rockwell, Figure 525, or Engineer / Owner approved equal.
4. Valves 6 Inches Through 8 Inches - Valves shall be lubricated ball valve-type plug valves, 500 pounds WOG, 1,000 pounds test, with flanged ends semi-steel body, coated plug, wrench operated, as manufactured by Nordstrom/Rockwell, Figure 1585, or Engineer / Owner approved equal.
5. Valve flanges shall be drilled and faced as specified for fittings.

K. Valve Boxes

1. A valve box and concrete collar shall be furnished and installed over each valve in the distribution system with the top of the box carefully aligned with the surface of the ground or paving.
2. Valve boxes shall be Buffalo two-piece sliding type, Catalog No. H-10364 as manufactured by the Mueller Company, Opelika Foundry No. 4905, or an approved equal. All boxes shall be of proper length to suit the conditions encountered.
3. All lids shall have the word "Gas" cast in raised letters.
4. Where valves are set in streets, alleys, driveways, or other locations where the valve boxes may be subjected to vehicle traffic, the valves boxes shall be furnished with base set on brick or concrete supports to prevent the box bearing against the valve or piping. Where valve is located outside of paved area, a connector valve box cover shall be provided.

L. Dead-End Fittings

Dead-end lines shall be capped or valved.

M. Blowing Out Pipe

Each section of the distribution system shall be thoroughly blown out with compressed air for removal of all dirt or other foreign matter. Taps shall be provided at all remote points on the distribution system to be used for purging the system of air. When all lines have been completely and thoroughly purged the taps shall be tightly sealed with steel plugs or by welding.

N. Encasement

1. Encasement Piping - 6 inches and larger shall be standard weight pressure pipe conforming to API-5L Grade B in accordance with ANSI Specification B36.10 and B36.19, latest edition, for seamless or electric welded pipe. Encasement sizes shall be as follows unless directed otherwise:

CARRIER

ENCASEMENT

2"	6"
3"	8"
4"	10"
8"	12"

Exterior of encasement shall be cleaned and primed with one coat of rust inhibiting primer by BLP Mobile Paints, RUS-KIL 10-10 or Engineer/Owner approved equal. Encasement shall be installed on a minimum of 0.1 percent slope.

2. Encasement Insulators - Insulators shall be as manufactured by T.D. Williamson, Inc., M-2 Plastic Thinsulator Spacers or Engineer/Owner approved equal. Insulators shall be spaced at not more than 12 feet on center and the maximum spacing from each end of encasement pipe to the first insulator shall be 1 foot. If required to assure necessary fit of insulator, the outside diameter of the carrier pipe may be increased by wrapping tightly with Z-TRU-Tape, as manufactured by T.D. Williamson, Inc., or Engineer/Owner approved equal.
3. Encasement Seals - Seals shall be elastomeric, stainless steel band applied, T.D. Williamson, Inc., Style Z-2 Casing Seal, or Engineer/Owner approved equal.
4. Refer to Encasement Pipe section for additional requirements.
5. If the ends of an unvented casing are sealed and the sealing is strong enough to retain the maximum allowable operating pressure of the pipe, the casing must be designed to hold this pressure at a stress level of not more than 72 percent of SMYS.
6. If vents are installed on a casing, the vents must be protected from the weather to prevent water from entering the casing.

O. Linestopper Fittings

1. Linestoppers for low pressure mains 1½-inch to 2½ inches shall be Mueller Company, H-17155 with bypass rubber stopper, or equal. For bypass use, H17160 on 1½ inch to 2 inch.
2. Linestoppers for 1-inch high pressure mains shall be Mueller Company, H-17086 or equal.
3. Linestoppers for 1½-inch to 2-inch high pressure mains shall be Mueller Company, H-17161 with rubber stopper, or equal. For 2½-inch use H-17155 with steel cap with bottom in for stop off and bottom out for bypass.
4. Linestoppers for 3-inch to 4-inch high pressure mains shall be Mueller Company, H-17261, or equal with steel wedge stopper, or equal.
5. Linestoppers for 6-inch to 8-inch pressure mains shall be Mueller Company, H-17276, or equal with steel wedge stopper, or equal.

P. Service Connections

1. General - Connections to existing mains shall be made as shown on the attached Plans and designated as "Hot Tap." Any deviations from the details and Specifications shall receive prior approval of the Utilities Board.
2. Location - Each service line connection to a main must be located at the top of the main or, if that is not practical, at the side of the main, unless a suitable protective device is installed to minimize the possibility of dust and moisture being carried from the main into the service line.
3. Compression-type connection to main. Each compression-type service line to main connection must:
 - a. Be designed and installed to effectively sustain the longitudinal pullout or thrust forces caused by contraction or expansion of the piping, or by anticipated external or internal loading; and
 - b. If gaskets are used in connecting the service line to the main connection fitting, have gaskets that are compatible with the kind of gas in the system.
4. Steel Services - Service connections to high pressure mains shall be made with Mueller No-BLO, ¾" x 1" H-1800 welding gas service tee with built-in valve and steel cap, or equal. The size of the tee shall be as required by the service pipe.
5. PE Services - Service connection to low pressure mains shall be made with Mueller No-BLO, ¾" x 1" steel services H-18100 and for plastic services ½" and 5/8" H-18158 gas service tee, or equal. The size of the tee shall be as required by the service pipe.

Q. Tracer Wire:

All PE pipe shall be marked using tracer wire buried six (6) inches above the top of the pipe. The tracer wire shall be No. 12 copper wire with polyethylene coated (yellow in color - TW12). Tracer wire may not be wrapped around the pipe. The pipe trench shall be backfilled to approximately three six (6) over the top of the pipe then tracer wire shall be placed over the top of pipe. Backfill shall be carefully placed to a depth of three six (6) by hand to assure that the wire is secured in place over the pipe. It is the intent to provide a means to locate the PE pipe using standard pipe locating equipment. The wire shall be carried up through valve boxes and terminated at least two (2) feet above the ground line to permit connecting to locating equipment. Excess wire at valves boxes shall be neatly rolled and stored in the valve box for easy accessibility. Tracer wire shall also be included through any bore with PE pipe.

8.04 INSPECTION

A. Of Material at Factory

All materials are subject to inspection and approval at the plant of the manufacturer.

All material shall meet the requirements specified, and shall have tests made by a laboratory, approved by the Utilities Board, showing the material does meet the Specifications. The records of the tests shall be furnished prior to the pipe being laid.

B. Of Materials at Deliver Point

During the process of unloading, all pipe and accessories shall be inspected for loss or damage in transit.

C. Field Inspection

All pipe and accessories shall be laid, jointed, tested for defects and for leakage with pressure in the manner herein specified in the presence of the Utilities Board or their authorized Inspector.

D. Disposition of Defective Material

All material found during the progress of the Work have flaws, or other defects will be rejected and such defective materials shall promptly be removed from the site of the Work.

8.05 HANDLING OF PIPE AND ACCESSORIES

A. Care

Pipe, fittings, valves, and other accessories shall, unless otherwise directed, be unloaded at the point of delivery, hauled to and distributed at the site of the Work; they shall at all times be handled with care to avoid damage.

B. At Site of Work

In distributing the material at the site of the Work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.

C. Care of Pipe Coating

Pipe shall be handled in such manner that a minimum amount of damage to the coating will result. Damaged coating shall be repaired in accordance with these Specifications.

D. Pipe Kept Clean

The interior of all pipe, fittings, and other accessories shall be kept free from dirt and foreign matter at all times.

8.06 ALIGNMENT AND GRADE

A. General

All pipe shall be laid and maintained to the required lines and grades; with fittings and valves at the required locations.

B. Protecting Underground and Surface Structure

Temporary support, adequate protection and maintenance of all underground and surface utility structures, drains, sewers and other obstructions encountered in the progress of the Work shall be furnished.

C. Deviation of Line and Grade

No deviation shall be made from the required line or grade except with the written consent of the Utilities Board.

D. Subsurface Explorations

Whenever necessary to determine the location of existing pipes, valves, or other underground structures, the Installer shall examine all available records and shall make all explorations and excavations for such purpose. The investigation shall be made in advance of any pipe laying.

E. Depth of Pipe Cover

All pipe shall be laid with a minimum cover of 36 inches, except for service lines on private property where the minimum cover over pipe shall be 30 inches, measured from the proposed or established street grade or the surface of the permanent improvement to the top of the barrels of the pipe. Where the new pipeline crosses existing or proposed ditches, the top of pipe shall be a minimum of 36 inches below the existing or proposed invert of ditch, whichever is lower, except where noted. Except as provided in Section 192.327 of Federal Standards, all pipe installed in a navigable river, stream, or harbor must be installed with a minimum cover of 48 inches (1219 millimeters) in soil or 24 inches (610 millimeters) in consolidated rock between the top of the pipe and the underwater natural bottom (as determined by recognized and generally accepted practices). All pipe installed offshore, except in the Gulf of Mexico and its inlets, under water not more than 200 feet (60 meters) deep, as measured from the man low tide, must be installed as follows:

1. Except as provided in Section 192.327 of Federal Standards, pipe under water less than 12 feet (3.66 meters) deep, must be installed with a minimum cover of 36 inches (914 millimeters) in soil or 18 inches (457 millimeters) in consolidated rock between the top of the pipe and the natural bottom.
2. Pipe under water at least 12 feet (3.66 meters) deep must be installed so that the top of the pipe is below the natural bottom, unless the pipe is supported by stanchions, held in place by anchors or heavy concrete coating, or protected by an equivalent means.

All pipelines installed under water in the Gulf of Mexico and its inlets, as a defined in 192.3, must be installed in accordance with 192.612(b)(3) of Federal Standards.

F. Underground Clearance

1. Each transmission line must be installed with at least 12 inches (305 millimeters) of clearance from any other underground structure not associated with the transmission line. If this clearance cannot be attained, the transmission line must be protected from damage that might result from the proximity of the other structure.
2. Each main must be installed with enough clearance from any other underground structure to allow proper maintenance and to protect against damage that might result from proximity to other structures.
3. In addition to meeting the requirements of paragraphs (a) or (b) of this section, each plastic transmission line or main must be installed with sufficient clearance, or must be insulated, from any source of heat so as to prevent the heat from impairing the serviceability of the pipe.
4. Each pipe-type or bottle-type holder must be installed with a minimum clearance from any other holder as prescribed in 192.175(b).

8.07 EXCAVATION AND PREPARATION OF TRENCH

A. Description

The trench shall be dug to the alignment and depth required and only a minimum distance in advance of pipe laying. The trench shall be so drained that workmen may work therein efficiently. It is essential that the discharge from pumps be led to natural drainage channels, to drains, or to sewers.

B. Width

The trench width may vary with and depend upon the depth of trench and the nature of the excavated material encountered, but in every case it shall be of ample width to permit the pipe to be laid and jointed properly and the backfill to be placed and compacted properly. The minimum width of unsheeted trench shall be 12 inches. The width of trench for service lines shall be approximately 6 inches.

C. Pipe Foundation in Good Soil

The trench, unless otherwise specified, shall have a flat bottom, conforming to the grade to which the pipe is to be laid to minimize stresses and protect the pipe coating from damage. The pipe shall be laid upon sound soil cut true and even so that the barrel of the pipe will have bearing for its full length.

D. Correcting Faulty Grade

Any part of the trench excavated below grade shall be corrected with approval material, thoroughly compacted.

E. Pipe Foundation in Poor Soil

When the bottom uncovered at subgrade is soft and cannot support the pipe, a further depth and/or width shall be excavated and refilled to pipe foundation grade as required.

F. Bracing

When the material through which the trench is excavated tends to fall in, run, or cave, the sides of the trench shall be braced, open sheeted or close sheeted, to an extent necessary to protect the pipe being laid. Such sheeting shall remain in place until the backfill is carried to a point at least 2 feet above the top of the pipe. The Installer shall exercise every precaution in removing the sheeting in order to avoid damaging the pipe. Should there be evidence that the removal of sheeting would damage pipe, the sheeting shall be left in place and no additional compensation will be allowed therefore. The top of sheeting left in place shall be at least 12 inches below natural ground.

G. Care of Surface Material for Reuse

If local conditions permit their reuse, all surface material suitable for reuse in restoring the surface shall be kept separate from the general excavation material.

H. Manner of Piling Excavated Material

All excavated material shall be piled in a manner that will not endanger the Work and that will avoid obstructing sidewalks and driveways. Gutters shall be kept clear or other satisfactory provisions made for street drainage. Also storm drains shall be kept clear.

I. Trenching By Machine or By Hand

The use of trench digging machinery will be permitted, except in places where operation of same will cause damage to trees, buildings, or existing structures above or below ground; in which case hand methods shall be employed.

J. Barricades, Guards, and Safety Provisions

To protect persons from injury and to avoid property damage, adequate barricades, construction signs, torches, red lanterns, and guards as required shall be placed and maintained during the progress of the construction work and until it is safe for traffic to use the trenched highway. Rules and regulations of the local authorities respecting safety provisions shall be observed.

K. Traffic and Utility Controls

Excavations for pipe laying operations shall be conducted in a manner to cause the least interruption to traffic. Where traffic must cross open trenches, suitable bridges shall be provided at street intersections and driveways. Valve pit covers, valve boxes, curb stop boxes, fire or police call boxes, or other utility controls shall be left unobstructed and accessible during the construction period.

L. Flow of Drains and Sewers Maintained

Adequate provisions shall be made for the flow of sewers, drains, and water courses encountered during construction, and any structures which may have been disturbed shall be satisfactorily restored upon completion of the Work.

M. Property Protection

Trees, fences, poles, and all other property shall be protected unless their removal is authorized; and any property damage shall be satisfactorily restored.

N. Interruption of Gas Service

No valve or other control on the existing system shall be operated for any purpose without approval of the Utilities Board, and all consumers affected by such operation shall be notified at least 1 hour before the operation and advised of the probable time when the service will be restored.

O. Protection From Hazards

1. The operator must take all practicable steps to protect each transmission line or main from washouts, floods, unstable soil, landslides, or other hazards that may cause the pipeline to move or to sustain abnormal loads.
2. Each aboveground transmission line or main, not located offshore or in inland navigable water areas, must be protected from accidental damage by vehicular traffic or other similar causes, either by being placed at a safe distance from the traffic or by installing barricades.
3. Pipelines, including pipe risers, on each platform located offshore or in inland navigable waters must be protected from accidental damage by vessels.

8.08 PIPE LAYING

A. Manner of Handling Pipe and Accessories into Trench

Proper implements, tools and facilities shall be provided and used for the safe and convenient prosecution of the Work. All pipe, fittings, valves, and accessories shall be carefully lowered into the trench, piece by piece, by means of derrick, ropes or other suitable tools or equipment, in such manner as to prevent damage to pipe or pipe coating. Under no circumstances shall pipe or accessories be dropped or dumped into the trench.

B. Pipe Kept Clean

All foreign matter or dirt shall be removed from the inside of the pipe before it is lowered into its position in the trench, and it shall be kept clean by approved means during and after laying.

C. Preventing Trench Water from Entering Pipe

At all times when pipe laying is not in progress, the open ends of pipe shall be closed by approved means, and no trench water shall be permitted to enter the pipe.

D. Highway Crossing

When any highway is crossed all precautionary construction measures required by the highway officials shall be followed.

E. Unsuitable Conditions for Laying Pipe

No pipe shall be laid in water, or when the trench conditions or weather is unsuitable for such work.

8.09 BACKFILL

See section entitled "Backfilling".

8.10 WELDING

A. Steel pipe shall be handled, welded and lowered in a first class workmanlike manner in accordance with best modern pipeline construction methods. Pipe shall be handled and strung to prevent damage to the coating. Immediately prior to lining up the pipe, each length of pipe shall be carefully examined for defects and swabbed clean with a steel wire brush or approved swab, pulled through the pipe.

B. Each welder shall be certified for type work specified in accordance with Appendix C of Minimum Safety Standards for Transportation of Natural Gas Pipelines, or Other Gas By Pipelines of the U.S. Department of Transportation of Natural and Other Gas By Pipelines of the U.S. Department of Transportation. Certificates of welders shall be furnished for the Utilities Board's files.

C. Each welder must be qualified in accordance with Section 6 of API 1104 or Section IX of the ASME Boiler and Pressure Vessel Code. No welder whose qualification is based on nondestructive testing may weld compressor station pipe and components. No welder may weld with a particular welding process unless, within the preceding 6 calendar months, he has engaged in welding with that process.

D. The pipe shall be aligned and welded in strict conformance with the applicable provisions of the Minimum Safety Standards for Transportation of Natural and Other Gas By Pipelines of the U.S. Department of Transportation.

E. The Utilities Board reserves the right to require test pieces cut from the Work and tested for destruction.

F. All welding shall be done in strict accordance with ANSI Specification B31.8, latest edition.

- G. All valves, connections, caps, and other appurtenances shall be tested concurrent with pipeline. In special cases where this is not possible, these items shall be checked by soaping or other approved means after the new line is in service and prior to backfilling.

8.11 TESTING OF DISTRIBUTION LINE

- A. All tests shall be conducted in the presence of the Utilities Board's authorized representative.
- B. Upon completion of each section of the distribution system, but prior to connecting any services, an air pressure of 1-1/2 times the design pressure (a minimum of 125 pounds per square inch) shall be maintained for a minimum of 24 hours without any drop in pressure. An Engineer/Owner approved recording pressure gauge shall be used to measure the pressure.
- C. All two-inch and four-inch diameter mains shall be "pigged" prior to testing in accordance with pigging manufacturer recommendations. Pigging equipment and appurtenances shall be approved by the Owner/Engineer prior to performing task.
- D. All lines four inches and larger shall be pigged.

8.12 HOLIDAY DETECTOR TESTS

Immediately prior to lowering of the pipe into the trench the entire section of completed pipeline shall be tested for continuity by means of an approved holiday detector and final repairs made as specified herein before.

8.13 TESTING OF SERVICE LINES

High pressure service lines shall be tested to 500 psi and low pressure service lines shall be tested to 100 psi for a period of 60 minutes each.

8.14 MAINTENANCE OF SURFACES

Following the certification of completion by the Utilities Board, the surface of the unpaved trenches, adjacent curb, sidewalks, gutters, shrubbery, fences, sod and other surfaces disturbed shall be maintained for a period of 3 months thereafter; and the repaved areas and adjacent curbs, gutters and sidewalks shall be maintained for 1 year after said certification.

8.15 PIPELINE MARKERS

- A. Pipeline markers shall be furnished and installed along the transmission and distribution lines and where directed by the Utilities Board. In general, two line markers shall be erected at highway and road crossings, and also along the mains to mark the pipe location.
- B. Line markers shall be of the type, size, dimensions, and markings as detailed on the attached detail. Markers shall be erected plumb and the earth around each completed marker tamped securely.

8.16 INSTALLATION OF SERVICE CONNECTIONS

After connection of the service pipe, the connection shall be coated and wrapped in accordance with these Specifications.

Service connections shall be routed to a point 2 feet from the property line, or as directed by the Utilities Board. Service lines shall be installed with a minimum of 30 inches of cover. The line shall be terminated 1 foot above grade, or as directed by the Utility, with a Mueller Company, No-BLO forged steel curb valve tee, or equal.

Service connections shall be made to the top or side of the main and shall be graded so as to drain into the main or to drip at the low points in the service line.

Underground service line valves shall be located in a cast iron curb box.

8.17 STANDARD DETAILS

The following standard details are furnished to indicate the Utilities Board's methods for fabrication/installation of certain equipment and materials under "Normal" conditions. Deviations from the standards are strictly forbidden without the consent of the Utilities Board.

Conditions may exist which require modification to the "Standard." Modification may be done only after contacting the Utilities Board and receiving new sketches or instruction for procedure.

Additional standard details may be developed and shall be kept on file by the Utilities Board. Any condition encountered or perceived that is not covered herein shall be called to the attention of the Utilities Board for its dispensation. See Appendix E for gas line construction details.

8.18 ABANDONMENT OF EXISTING MAINS

Existing mains and services, which are replaced by new lines and taken out of service, shall be abandoned in place. The Installer shall advise the Utilities Board as each main or segment of main is abandoned and the limits of the abandoned main. The Utilities Board reserves the right to salvage any material which is abandoned.

All gas lines to be abandoned shall be disconnected from all sources of supplies of gas, purged of gas, filled and capped with water, and ends shall be capped. Water is used for

8.19 CATHODIC PROTECTION SYSTEMS

A. Testing posts shall be located directly over the double wire connections, or as near to this location as possible.

1. The Installer shall submit corrosion protection engineer's qualifications to Utilities Board for approval prior to authorizing him to work.

2. The corrosion protection engineer shall be selected by the Installer subject to approval by the Utilities Board. The corrosion protection engineer shall be a professional engineer registered in the State of Alabama and shall be qualified corrosion control technician with at least 5 years experience in the design of cathodic protection systems for pipelines. The corrosion protection engineer may be Cathodic Protection Services, 110 Phlox Avenue, Suite B, Metairie, Louisiana; Allied Corrosion Industries, Inc., 1550 Cobb Industrial Drive, N.E., Marietta, Georgia; or an approved equal.
 3. After the pipeline has been constructed, disinfected and placed into service, the Installer shall provide the services of a corrosion protection engineer to conduct a survey of the test station and to design a cathodic protection system for the pipeline. The engineer will be required to gather data from each test station and to design ground beds and rectifier assembly sufficient to protect the new pipeline for a period of at least 20 years.
 4. Details for any cathodic test stations shall be furnished to the Utilities Board.
 5. Details for the rectifier assembly shall be provided to the Utilities Board for approval.
 6. Anode beds shall be placed by the Installer as recommended by the corrosion protection engineer and approved by the Utilities Board. An estimated quantity of deep well graphite anodes will be included in the Proposal for bidding purposes with the actual quantity to be determined in accordance with these Specifications.
- B. Testing leads shall be stranded copper wire as shown on the Plans with type TW moisture-proof insulation. Insulation shall be color coded. Accidental damage to insulation shall be wrapped with two lapped layers of Scotch Electrical Tape Number 22.

These leads shall be attached to the pipeline by the Cadweld process, using a special mold and an ignitable thermite mixture. A circle roll area 3 inches in diameter should be exposed on the top surface of the pipe and thoroughly cleaned to the raw metal. Molds, copper brazing sleeves, ignitable power, etc., shall be as furnished by Erico Products, Inc., 2070 East 61st Place, Cleveland, Ohio 44103. A Type TB-3 welder shall be used.

- C. The completed brazed connection shall be thoroughly coated and wrapped in accordance with the requirements of these Specifications.

8.20 CONTRACTOR

Any Contractor performing work on the gas system or installing a portion of the gas system to be accepted by the Utilities Board of the City of Daphne shall comply with the Utilities Board of the City of Daphne Drug and Alcohol Policy. The Contractor's policy shall be submitted to the Utilities Board of the City of Daphne or a written statement that

the Contractor's policy either meets or exceeds the Utilities Board of the City of Daphne's policy shall be provided.

END OF SECTION