

Installation Guide

Service Line Installation Standards



March 3, 2015

Preface

The information presented in this manual is provided as a guide to those installing, inspecting, and testing plastic natural gas service lines within the Peoples Natural Gas' service territory.

The most current version of this manual can be found on the Peoples website at the following addresses:

www.peoples-gas.com

www.peoplestwp.com

www.equitablegas.com

The requirements set forth in this manual are intended to ensure compliance with Title 49 of the Code of Federal Regulations (CFR) Department of Transportation Part 192, "Transportation of Natural Gas and Other Gas by Pipeline: Minimum Federal Safety Standards" (49 CFR 192), Peoples' Policies and procedures, and local building codes. However, it should be noted that the information presented is not intended to address all local code requirements.

Failure to adhere to the following guidelines may result in forfeiture of installation privileges in Peoples service territories.

Revision History

This most current version of this manual replaces all prior installation instructions.

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1. SERVICE LINE INSTALLER REQUIREMENTS

a) OPERATOR QUALIFICATION

i) Federal Pipeline Regulations, 49 CFR Part 192, require that ALL individuals conducting replacement, renewal, maintenance, and repair activities on pipeline facilities, to include the customer service line, be "Qualified" to perform the tasks. To be "Qualified," the individual must be evaluated to assure they are capable of performing the tasks properly and safely, in accordance with Peoples' procedures, utilizing approved materials. Further, they must be able to properly recognize and react to any abnormal operating condition they may encounter while performing these tasks. The qualifications associated with service line work include a variety of covered tasks, for which Peoples has determined three years is the appropriate re-qualification interval. However, Federal Pipeline Safety Regulations dictate a one-year interval for joining of plastic pipe. Therefore:

(1) SLI's must qualify in all covered tasks initially and at least every three years.

(2) Peoples' natural gas service line qualification program includes a qualification to join plastic pipe using mechanical (stab and compression) fittings. 49 CFR 192.281 - .287 addresses plastic pipe joining and requires each operator to establish a method to determine "that each person making joints in the operators system is qualified in accordance with this section." This task has an annual re-qualification requirement. SLI's will need to re-qualify annually and remain in good standing with this requirement or they will be removed from the approved SLI's listing.

ii) Currently, Peoples has authorized the following third parties to perform qualification evaluations for work in its service territory:

(1) Utilities Technology International (UTI)

Phone: 1-614-879-7316

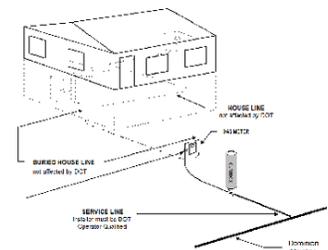
www.uti-corp.com/training.html

(2) Professional Utility Resources (PUR)

Phone: 1-216-870-2707

www.pur-co.com

To schedule for an evaluation, please contact one of the above listed evaluators for information regarding their next session in your area. iii) The DOT Federal Pipeline Safety Regulations governing Operator Qualification apply to work upstream of the meter. Plumbers and contractors performing work on customer-owned houseline downstream of the meter are not covered by the Operator Qualification requirements, though they are subject to the requirements of the National or International Fuel Gas Code (see drawing).



b) DRUG AND ALCOHOL PROGRAMS

i) Department of Transportation - Pipeline and Hazardous Materials Safety Administration's (DOT-

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PHMSA), 49 CFR Part 199 regulations also require all persons performing pipeline related work to be enrolled in an approved Drug and Alcohol Testing Program.

ii) There are several components required in order to comply with the regulations regarding Drug and Alcohol Programs. Some examples are:

- (1) A DOT-PHMSA Anti-Drug and Alcohol Misuse Prevention Plan,
- (2) pre-employment and random testing for prohibited substances,
- (3) post accident and reasonable cause testing for alcohol and prohibited substances,
- (4) training,
- (5) recording keeping,
- (6) Employee Assistance Program.

iii) While some contractors are known to self-administer their company's drug and alcohol program, the majority joins a consortium in order to comply with these Drug and Alcohol testing requirements. There are several available to provide the administration of these regulatory requirements. Although we do not endorse one consortium, below is a listing of several national consortia. Please contact them by phone or mail, if interested.

Pipeline Testing Consortium, Inc.
9 Compound Drive
Hutchinson, KS 67502
Phone: 1-800-294-8758

Spectrum Medical Services, Inc.
6505 Mars Road
Cranberry Township, PA 16066
Phone: 1-800-253-5077

Bem Enterprises, Inc.
145 Eagle Avenue
Indiana, PA 15701
Phone: 1-800-862-2191

I.E.B.T. Corporation
P.O. Box 266
Mogadore, OH 44260
Phone: 1-800-628-5106

D.D.T.A. Services, Inc.
P.O. Box 461
East Palestine, OH 44413
Phone: 1-800-488-3382

Integrity Verifications, Inc.
7515 Pearl Road
Cleveland, OH 44130
Phone: 1-800-914-2659

D.D.T.A. Services, Inc.
P.O. Box 461
East Palestine, OH 44413
Phone: 1-800-488-3382

Substance Abuse Management, Inc.
500 North 19th Street
Milwaukee, WI 53233
Phone: 1-800-247-7264

Advantage Resources
Route 30 East
10 Oakley Park
Greensburg, PA 15601
Phone: 1-724-600-0180

Ameritest
1221 Granville Pike
Lancaster, OH 43130
Phone: 800-782-8378

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- iv) Peoples has contracted with Veriforce to provide oversight of contractor operator qualification and SLI Drug & Alcohol programs. Whether you self-administer or join a consortium, your plans and testing data must be reviewed and approved by Veriforce.
- (1) Steps to Getting Started in a DOT-PHMSA Anti-Drug and Alcohol Misuse Program:
- (a) Make the decision to self-administer or join a consortium.
 - (b) Obtain written PHMSA Anti-Drug and Alcohol Misuse Plans.
 - (c) Forward copies of your company's PHMSA Anti-Drug and Alcohol Misuse Plans to Veriforce (Peoples Natural Gas' Drug and Alcohol Monitoring Service) for review.
 - (d) Veriforce will review the program documents and notify Peoples Natural Gas of your status when satisfactory.
- (2) If you have questions or need additional information contact:

Veriforce
Drug and Alcohol Division
1776 Woodstead Court, Suite 119
The Woodlands, TX 77380
Toll Free: 800.426.1604 x32
Email: drugalc@veriforce.com

2. APPROVED MATERIALS

Please note that Peoples prefers and recommends that services are constructed of plastic materials when possible. Peoples approved materials are available from McJunkin Corporation, as well as other plumbing suppliers. Please refer to pipe sizing charts (pages 19-30) prior to service installation to ensure adequate gas capacity.

A) PLASTIC PIPE FOR SYSTEMS OPERATING AT 500 SCFH OR LESS

i) New Services

- (1) Systems Operating at 5-100 psig:
 - (a) 1/2" CTS .090W PE3408/4710 Coiled
- (2) Systems Operating at 0 – 60 psig:
 - (a) 1" CTS .099W PE2406/2708 Coiled
 - (b) 1-1/4" IPS DR 10 PE2406/2708 Coiled
 - (c) 2" IPS DR11 PE 2406/2708 Coiled or Stick
- (3) Systems Operating at 0 – 100 psig:
 - (a) 1" CTS .101W PE3408/4710 Coiled
 - (b) 1-1/4" CTS .121W PE3408/4710 Coiled
 - (c) 2" IPS DR 11 PE 3408/4710 Coiled or Stick
- (4) Larger pipe sizes installed per Peoples Gas main line requirements.

ii) Renewed Services

- (1) Systems Operating at 5 – 100 psig:
 - (a) 1/2" CTS .090W PE3408/4710 Coiled
- (2) Systems Operating at 0 – 60 psig:
 - (a) 1" CTS .099W PE2406/2708 Coiled
 - (b) 1-1/4" IPS DR 10 PE2406/2708 Coiled
 - (c) 2" IPS DR11 PE 2406/2708 Coiled or Stick
- (3) Systems Operating at 0 – 100 psig:
 - (a) 1" CTS .101W PE3408/4710 Coiled
 - (b) 1-1/4" CTS .121W PE3408/4710 Coiled
 - (c) 2" IPS DR 11 PE 3408/4710 Coiled or Stick
- (4) Larger pipe sizes installed per Peoples Gas' main line requirements.

iii) Peoples Natural Gas approved plastic pipe manufacturers:

Performance Pipe DriscoPlex® – All standards
US Poly Company (Uponor) – All standards
Polypipe by Dura-Line – All standards
Charter Plastics – All standards
Oil Creek Plastics – 1-1/4" IPS and below

Note: Polyethylene plastic pipe over two years old from date of manufacture, is not suitable for use in the Peoples Gas pipeline system.

b) RISER SPECIFICATIONS

- i) Anodeless Meter Riser
 - (1) 1" MPT OR 1-1/4" MPT, Outlet to match meter set, Inlet to match plastic service line standard
 - (a) Use bracket for support
- ii) The following are the names of manufacturers whose materials meet Peoples' riser specifications:
 - (1) Elster/Perfection Corporation – All sizes (both factory and field fit)
 - (2) Continental – Anodeless (Rigid) Meter Risers only - All sizes (factory fit only)
 - (3) Energy Control Systems –All sizes Anodeless Flexible and Rigid Meter Risers (factory fit only)

c) TRACER WIRE AND WARNING TAPE

Peoples Natural Gas' current tracer wire installation requirements can be found using the following link: www.peoples-gas.com

- i) Tracer Wire
 - (1) Use continuous lengths of approved tracer wire.
 - (a) #12 AWG (or larger diameter) solid copper wire with yellow thermoplastic coating.
 - (i) Peoples Natural Gas Peoples Part # 42066689
 - (ii) McJunkin Part # 6431-3013
- ii) Wire Connectors
 - (1) Must be manufactured for use below ground and in wet locations and be appropriate for the size and number of wires being connected.
 - (a) Wire Nuts
 - (i) Connector, Tracer Wire, 12AWG w/ Corr Inhibitor for Underground and Wet Locations, Yellow, DryConn P/N 31556
 - (ii) Peoples Part # 42111954
 - (iii) McJunkin Part # 8816-4750
 - (b) Bonding Lugs
 - (i) Connector, Tracer Wire, Direct Bury Lug, #14-10 AWG, 50V max, For Underground Use, Waterproof / Corrosion Proof, Yellow, DryConn P/N 90120, Peoples Part # 42106730
- iii) Bonding Pipe Clamps
 - (1) To be used to attach tracer wire to end of casing on replacement installations
 - (a) Clamp, Service line, w/ Wire Attachment and Pin, For Use w/ Tracer Wire, 1- 4" Pipe Diameter
 - (i) Peoples Part # 42111955
 - (ii) McJunkin Part # 6196-6675
- iv) Wax Wrap, Corrosion Resistant Coating
 - (1) Used to wrap tracer wire bonding clamps attached to casing to prevent corrosion.
 - (a) Primer, Trenton Wax, Brown, Surface conditioner for underground metal surfaces.
 - (i) Peoples Part # C0180884
 - (ii) McJunkin Part # 6269-4040

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- (b) Wax Wrap, Trenton #1, Brown, For Underground Use
- (i) Peoples Part # C0958677
- (ii) McJunkin Part # 6269-4029

- v) Warning Tape
 - (1) 6 inch Plastic, Yellow, Warning, "CAUTION – GAS PIPE BELOW"
 - (a) Peoples Part # C0727800

d) SERVICE HEAD ADAPTERS

- i) Used when replacing a service line to an inside meter by insertion methods.
 - (1) Adapter, 1-1/4" FPT x 1" CTS, 0.99W COMP x 1-1/2" MPT, Service Head
 - (a) Peoples Part # C0043527
 - (b) Elster/Perfection Part # 71162
 - (2) Adapter, 1-1/2" FPT x 1" CTS, 0.99W COMP x 1-1/2" MPT, Service Head
 - (a) Peoples Part # C0043529
 - (b) Elster/Perfection Part # 71183

Please consult with local office regarding use of adapters not listed.

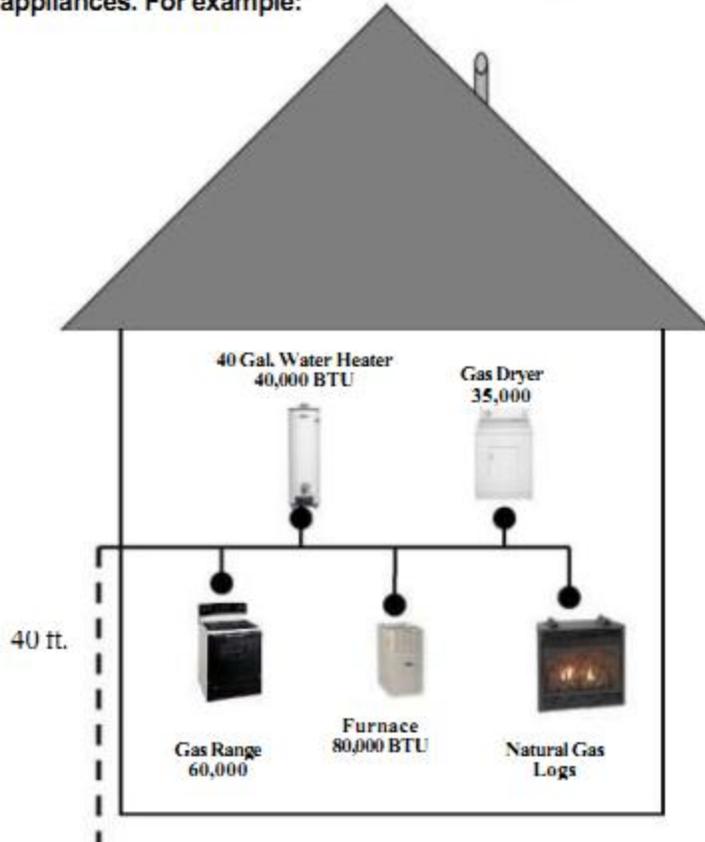
e) HOUSELINES

Natural gas houseline piping materials and components shall be acceptable to the authority having jurisdiction. Peoples is not a testing or approval agency. Peoples accepts houseline piping materials listed and installed according to the National or International Fuel Gas Codes.

3. PLASTIC PIPE SIZING REQUIREMENTS

Proper sizing of the pipe is important to ensure that each gas appliance receives enough gas to perform properly. An SLI must know the inlet pressure from the main (confirm with Peoples Natural Gas' Engineering Department where necessary), current and future anticipated load in cubic feet of gas per hour (cu. ft./ hr), and the length of the service in order to determine which diameter plastic pipe to install. The sizing charts in Appendix 1 can be used to determine the appropriate diameter piping for service lines a) up to 200 feet in length, b) up to 2 inches in diameter, and c) with up to 60 pounds inlet pressure. Please refer to the International or National Fuel Gas Codes for sizing lines in excess of these limits. a) DETERMINING LOAD 40,000 + 35,000 + 60,000 + 80,000 + 30,000 = 245,000 BTU's To convert from BTUs to cu. ft. / hr, divide BTU by 1,000: 245,000 BTU's / 1,000 = 245 cu. ft. / hr Once the load is known, determine the inlet service pressure (assume low pressure - 7 inches WC or 4 ounces – for this example) and the length of the service (assume i)

i) In order to determine the “load”, the SLI must determine the total BTU’s of all natural gas appliances. For example:



$$40,000 + 35,000 + 60,000 + 80,000 + 30,000 = 245,000 \text{ BTU's}$$

To convert from BTUs to cu. ft. / hr, divide BTU by 1,000:

$$245,000 \text{ BTU's} / 1,000 = 245 \text{ cu. ft. / hr}$$

Once the load is known, determine the inlet service pressure (assume low pressure - 7 inches WC or 4 ounces – for this example) and the length of the service (assume 40 feet for this example). Refer to the Pipe Sizing Charts in Appendix 1 to determine the appropriate plastic pipe size.

b) USING THE CHARTS

i) From our example above, we determined a 245 cu. ft. / hr load on a low pressure (4 ounce system), with a 40 foot service line length. The chart indicates that 0.121 wall 1-1/4" CTS tubing is capable of delivering 414 cu. ft. / hr with a 4 ounce inlet pressure, and is able to accommodate the 245 cu. ft. / hr load.

Inlet Pressure 0.25 psig (= 4 oz. per in² = 7 inches of water column)
Pressure Drop 0.5 inch water column

CTS Size (inches)	Nominal Size (inches)	Nominal OD (inches)	Inside Diameter (inches)	Length						
				10	20	30	40	50	60	70
.062 wall CTS Tubing PE3408										
3/8	3/8	0.375	0.251	15	10	8	7	6	5	5
.090 wall CTS Tubing PE3408										
1/2	5/8	0.625	0.445	72	48	38	32	29	26	24
.099 wall CTS Tubing PE2406										
1	1 1/8	1.125	0.927	532	357	283	240	211	190	177
.121 wall CTS Tubing PE3408										
1 1/4	1 3/8	1.375	1.133	918	617	488	414	364	328	303
SDR 11 IPS Pipe (6800 Series)										
2	2 3/8	2.375	1.943	3,994	2,681	2,123	1,800	1,583	1,425	1,303

c) CHART CALCULATIONS

i) Peoples Natural Gas' pipe sizing charts were prepared using the Mueller Equation and the following constants:

Atmospheric Pressure 14.7 psia
Standard condition temperature 60⁰ F
Gas specific gravity 0.6
Gas viscosity 7.39 x 10⁻⁶ lb/ft sec.
1 cu. ft. gas = 1,000 BTU's
Pressure Drop = 10%

d) Peoples will not provide 2 psig gas service for a single-family dwelling.

4. INSTALLATION REQUIREMENTS

a) GENERAL REQUIREMENTS

i) Service Lines

- (1) Service lines shall be buried with a minimum of 12 inches of cover in private property and a minimum of 18 inches of cover in streets and roads. However, where an underground structure prevents installation at those depths, the service line shall be able to withstand any anticipated external load.
- (2) Where cover requirements cannot be met due to existing substructures, the portion of the service line that could be subjected to superimposed loads shall be cased or bridged, or the pipe shall be appropriately strengthened.
- (3) Service lines shall be installed in a manner that will minimize anticipated piping strain and external loading.
- (4) Service lines installed through walls shall be encased in a protective pipe and shall be sealed at the wall to prevent gas or water leakage into the building.
- (5) Service lines shall not be installed under a building.
- (6) The transition from plastic pipe to more rigid piping at the building wall or meter set assembly shall be protected from shear and bending.
- (7) Plastic pipe installed in a vault or any other below-grade enclosure must be completely encased in gas-tight metal pipe and fittings that are adequately protected from corrosion.
- (8) Plastic pipe shall be installed with sufficient clearance and shall be insulated from any heat source that may impair serviceability of the pipe.
- (9) No person may make a plastic pipe joint unless that person has been qualified in plastic pipe joining utilizing qualified plastic pipe joining procedures.
- (10) Take precautions when plastic pipe is dragged along hard surfaces such as concrete, asphalt and stone.
- (11) Inspect all plastic pipe and tubing for cuts, gouges, deep scratches and other imperfections during and after installation. Inspections would include direct burial, insertion, directional boring installations, wherever the plastic pipe is exposed (i.e., exposed services and tie-in holes). Defects in plastic pipe that penetrate the pipe wall by more than 10 percent of the pipe wall thickness shall be removed.
- (12) When installing a new service line or replacing an existing service line, a minimum distance of 12 inches must be maintained from existing conduits, ducts, sewer lines and similar structures, including abandoned structures.
- (13) Consideration shall be given to not installing service lines in close proximity trees or shrubs.

ii) Tracer Wire and Warning Tape

In order to accurately locate plastic pipe and minimize future damage, plastic service line installations must include the use of electrically conductive locating, or “tracer”, wire and warning tape. The traceability of the service and/or the continuity of the tracer wire will be verified prior to accepting the installed service line into the system.

(1) Specific Installation Requirements

(a) Direct Bury Installations

- (i) A continuous piece of approved tracer wire is to be installed few inches below

the plastic pipe.

- (ii) One end is to terminate with the plastic, coiled up at the main, while the other shall follow the riser up to the wall bracket.

(b) Insertion (Replacements)

- (i) When inserting plastic through old steel service lines, tracer wire and approved bonding clamps must be installed to the exposed ends of the old steel, which will now act as casing and allow for locating the service.
- (ii) The tracer wire shall then follow the plastic as in direct bury installations.
- (iii) Exposed ends of tracer wire and the approved bonding clamps are to be coated with approved wax wrap to prevent corrosion.
- (iv) The casing surface and the bonding clamp must be coated with an approved primer, then completely wrapped with wax tape.

(c) Plow-In

- (i) Plastic warning tape and tracer wire shall be installed with the plastic.

(d) Directional Bore

- (1) Before boring with plastic pipe, a thorough investigation of the area, to include pot-holing where necessary, shall be made to determine the location of all underground utilities or structures.
- (2) Boring installations should not be attempted in the areas of sanitary sewer laterals if the exact locations and depths of the facilities are unknown. Damage to sewer laterals by boring equipment could result in explosive amounts of natural gas in a structure. Installers are encouraged to verify sewer laterals were unharmed during installation with a post-construction inspection using a camera if the sewer lateral was not exposed during boring.
- (3) If plastic pipe is pulled by directional boring, a weak link shall be used that would limit the pulling forces on the plastic pipe.
- (4) Three pieces of 8 gauge locator (tracer) wire shall be pulled with the plastic pipe to facilitate location of the pipe after installation. Prior to the pulling of plastic pipe, tracer wire shall be attached to the outside of the pipe in the 3 o'clock, 6 o'clock and 9 o'clock positions.
- (2) In an effort to minimize below ground splices, wherever practical, use a continuous piece of approved tracer wire.
- (3) Tracer wire may not be wrapped around the pipe.
- (4) Plastic warning tape shall be installed over all direct buried service lines at approximately 6 inches below ground surface.
- (5) Tracer wire shall be installed as shown in the application specific diagrams found in Appendix 2.

iii) Meter Manifolds

Meter manifolds for all new installations shall be located outside.

b) INSTALLATION TECHNIQUES

i.) Direct Burial

- (1) The ditch bottom shall be as smooth as possible, free of rocks, debris and any sharp protrusions.
- (2) Plastic pipe shall always be laid into the ditch allowing slack for thermal contractions and expansions.

- (3) Changes in direction shall be made with a fitting if the change in direction exceeds the minimum bending radius of the pipe.
- (4) The backfill shall be placed and compacted in layers. The fill around the pipe and first layer over the pipe shall be select backfill material.
- (5) Backfilling of service lines shall only be performed or supervised by operator qualified personnel.
- (6) The use of blocking to support the pipe is prohibited.
- (7) There shall be a minimum of 12 inches of cover on private property and 18 inches in streets and roads
- (8) The material used for backfill shall be free of materials that could damage the pipe.
- (9) Plastic pipe must be installed so as to minimize shear or tensile stresses resulting from construction, backfill, thermal contraction or external loading. Plastic pipe shall be laid and continuously supported on undisturbed or well compacted earth rather than on blocking to minimize shear stresses. When rock, ledge, hard pan or boulders are encountered, the trench shall be padded with at least six inches of select backfill and filled with at least six inches over the plastic pipe.
- (10) When installing new direct buried plastic gas service lines in a common trench (joint trench with other utilities), a minimum of 12 inch radial separation shall be maintained between supply facilities such as steam lines, plastic gas lines, other fuel lines, and direct buried electrical supply lines. If 12 inches separation cannot be feasibly attained at the time of installation, then mitigating measures shall be taken to protect lines against damage that might result from proximity to other structures. Examples may include the use of insulators, casing, shields or spacers. This does not apply to services crossing one another at 90 degrees.

ii) Insertion

Plastic pipe may be inserted into existing service lines in lieu of replacement by trenching. The SLI must verify that the internal diameter of the existing pipe, which will become casing, will accommodate plastic pipe sized according to the Pipe Sizing Charts in Appendix 1.

- (1) The old pipe shall be cleaned or reamed to the extent necessary to remove sharp edges and care shall be taken when guiding the plastic pipe into the casing to prevent damaging the plastic pipe on the casing edge.
- (2) Pushing the pipe in, or a combination of pushing and pulling it in, is preferable to pulling it in to prevent excessive tensile loading.
- (3) Wherever possible, the plastic shall be pushed from the street to the meter. The excavation at the street shall be at least 4 ft. by 4 ft.
- (4) The leading face of the plastic pipe shall be closed during insertion.
- (5) Exposed plastic pipe or tubing entering or exiting casing must be of sufficient length and properly supported to withstand the anticipated external loading or it must be protected using a suitable bridging piece capable of withstanding the anticipated external loading.
- (6) To prevent damage to the plastic pipe during insertion, the casing openings shall be cleaned to remove sharp edges and shielded.
- (7) To prevent shearing type forces, protective sleeves or bridging of sufficient length shall be installed at shear points.

iii) Plow In

- (1) Plastic pipe may be installed by a pull-in or plant-in method if soil conditions, location, and survey of underground obstructions are found satisfactory.
- (2) Pipe will be placed in the ground in a manner that will minimize longitudinal tensile stresses.
- (3) Plastic warning tape and locator (tracer) wire shall also be installed while plowing-in the plastic in accordance with the direct burial method.

iv) Directional Bore

- (1) Before boring with plastic pipe, a thorough investigation of the area, to include pot-holing where necessary, shall be made to determine the location of all underground utilities or structures.
- (2) If plastic pipe is pulled by directional boring, a weak link shall be used that would limit the pulling forces on the plastic pipe.
- (3) Boring installations should not be attempted in the areas of sanitary sewer laterals if the exact locations and depths of the facilities are unknown. Damage to sewer laterals by boring equipment could result in explosive amounts of natural gas in a structure. Installers are encouraged to verify sewer laterals were unharmed during installation with a post-construction inspection using a camera if the sewer lateral was not exposed during boring.
- (3) Locator (tracer) wire shall be installed to facilitate location of the pipe after installation.

c) APPLICATION SPECIFIC INSTALLATION REQUIREMENTS

i) Low Pressure Systems

All low pressure customers will have a “curb valve” on the customer’s side of the street.

(1) Specific Requirements

Refer to the drawings in Appendix 2 for specific installation requirements for each scenario below:

- (a) New Service – Direct Bury
- (b) Replaced Service – Sleeved - Inside Meter
- (c) Replaced Service – Sleeved – Outside Meter

ii) Regulated Pressure

Existing medium and intermediate pressure systems may not have a curb valve installed on the service line; therefore, it is necessary to contact the local Peoples office for the location of a pre-installed service tap prior to installation of new service line piping.

(1) Specific Requirements

Refer to the drawings in Appendix 2 for specific installation requirements for each scenario below:

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- (a) New Service - Medium Pressure - Direct Bury
- (b) Replaced Service – Medium Pressure – Sleeved

d) METERS AND REGULATORS

i) General Requirements:

- (1) New meters installations must be located outside.
- (2) When selecting a meter location, consideration shall be given to potential damage by outside forces such as vehicles, construction equipment, tools or materials which could be placed on the meter and falling objects. When such potential is evident, the meter shall be protected or an alternative location selected.
- (3) Meters and service regulators shall be accessible for reading, inspection, repairs, testing, changing and operation of the gas shutoff valve.
- (4) When more than one meter is set at a structure, the meters shall be set at one location when practical.
- (5) When more than one meter is set at a structure, each meter must be marked by a metal tag (or other permanent means) attached by the SLI, designating the part of the building being supplied by that meter.
- (6) When practical, no building shall have more than one service line or more than one meter location.
- (7) If a meter cannot be installed outside because an acceptable outside location is not available or protection from ambient temperatures is necessary to avoid meter freeze-ups, approval by an Operations Manager is required.
- (8) Installers must consult with a Company representative for a meter location when unusual circumstances exist.

ii) Outside Meter and Regulator Locations:

- (1) Meters and service regulators shall not be installed in contact with the soil or other potentially corrosive materials. The potential for shorting out the insulated fitting shall also be considered.
- (2) The meter, regulator and exposed connected piping must be protected from atmospheric corrosion by coating with approved materials.
- (3) Outside meters shall be installed aboveground in a protected location adjacent to the building served.
- (4) Service regulators shall be installed where gas released through the regulator relief can escape freely into the atmosphere and away from openings into buildings.
Note: The service regulator vent opening has a threaded fitting that allows the vent to be piped away from opening into buildings and potential sources of ignition.
- (5) Maintain 3 feet from ignition sources, such as exhaust from clothes dryers, furnace intake and exhausts, etc. Note: Electric utility meters are not considered a source of ignition.

iii) Inside Meter and Regulator Locations:

- (1) Approval must be granted by Peoples before a meter on an existing

- medium and intermediate pressure system can be installed inside a structure.
- (2) Each service regulator installed within a building shall be located as near as practical to the point of service line entrance.
 - (3) If a regulator is installed within a building, a separate vent shall be run to the outside for each regulator.
 - (4) Each meter installed within a building shall be located in a ventilated place and shall not be less than 3 feet from any source of ignition or any source of heat which might damage the meter.
 - (5) Where practical, meters shall not be located in confined spaces such as engine rooms, boiler rooms, furnace rooms or electrical equipment rooms, nor living quarters, closets, restrooms, bathrooms or similar locations. In general, the meter must be accessible.
 - (6) Meters shall not be installed in a crawl space.
 - (7) A readily accessible shutoff valve shall be located outside the building.
Contact a local supervisor with questions regarding this issue.

e) HOUSE LINES

- i) The installation of a customer valve is recommended for safety considerations.
This valve should be installed between the outlet of the meter and the building wall (as shown on the Appendix 2 Installation drawings).

5. PRESSURE TESTING PROCEDURES

A) SERVICE LINE PRESSURE TESTING PROCEDURES

Peoples Natural Gas requires that all service line installations be pressure tested prior to connection to the distribution system. For builder / developer installed lines, the installer must leave the pressure test and gauge on the installed line, at the required test pressure, for inspection by a Peoples representative at the time of connection (tie-in).

i) Low Pressure: (Less than 1 PSIG)

- (1) Install the gauge assembly on service line.
- (2) Install the appropriate blank or dead-end stab fitting at the end of the service line (at the curb)
- (3) Pressurize the service line to 90 pounds
- (4) If the line is smaller than 2 inches the test must hold for a minimum of 10 minutes
- (5) If the line is 2 inches or larger, the test must hold for a minimum of 1 hour.

ii) Medium Pressure: (1 to 60 PSIG)

- (1) Install the gauge assembly on service line.
- (2) Install the appropriate blank or dead-end stab fitting at the end of the service line (at the curb)
- (3) Pressurize the service line to 90 pounds
- (4) If the line is smaller than 2 inches the test must hold for a minimum of 10 minutes
- (5) If the line is 2 inches or larger, the test must hold for a minimum of 1 hour

iii) Intermediate Pressure: (61 to 100 PSIG)

- (1) Contact a Peoples representative when these pressure conditions exist.
- (2) Meter will be installed at mainline to allow adequate space for required regulation devices; therefore, a service line most likely will not exist.

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Service Line Installation Standards

- (3) Location of meter will be determined by a Peoples employee under these conditions. Testing requirements will also be determined by the Peoples representative.
- iv) Recommended Materials
 - (1) The following is a list of the recommended materials:
 - (a) A calibrated gauge/Kuhlman gauge with a mid-range of approximately 90 pounds.
 - (b) A calibrated gauge/Kuhlman gauge with a mid-range of approximately 150 pounds (if required).
 - (c) A tee assembly to accept a 1/8" male thread, a 1/4" gauge, and a Schrader valve (tire valve) for the introduction of air into the system.
 - (d) 3/4" threaded steel plug (if required)
 - (e) 1" threaded steel plug (if required)
 - (f) 3/4" X 1/8" reducing plug (if required)
 - (g) 1" X 1/8" reducing plug (if required)
 - (h) A blank or dead-end stub to fit the appropriate service line size.
 - (i) An air compressor, pump, or compressed gas cylinder capable of pressurizing the service line to a minimum of 150 pounds pressure.

Gauges used for service line pressure testing shall meet the requirements of ASME B40.1, Grade B, 3-2-3% accuracy. While other gauges may be used, the gauge below meets these requirements and is available from McJunkin Corporation locations in Ohio, Pennsylvania, and West Virginia.

McDaniel Gauge (0-160 PSIG)
J8E, Utility Style 2 1/2"
Dial Size 1/4" NPT Bottom
Connected
Black Enameled Steel Case
Brass Internals



6. REQUESTING CONNECTION (TIE-IN) TO THE PEOPLES DISTRIBUTION SYSTEM

a) For PNG and PTWP territories: SERVICE INSTALLATION RECORD (SIR FORM)

Once the installation is complete and has been successfully pressure tested, a completed Service Installation Record Form (Peoples Form No. 700116, see Appendix 3) must be faxed to the following number: 1-888-846-3259

i) Completing the Service Installation Record:

- (1) Complete all required items on the form
- (2) Provide your Operator Qualification Universal ID #
- (3) Ensure that you complete the "Installing Firm" section accurately. Use the same company name used for your approved DOT Drug and Alcohol Plan
- (4) Ensure that all information is legible and can be read by a Peoples Natural Gas representative
- (5) The qualified SLI must sign and date the form

ii) Upon receipt of the completed form, a Peoples representative will verify that the Operator Qualification credentials of the SLI are valid, and will verify that the employer has a DOT-PHMSA compliant Drug and Alcohol testing program that has been verified and approved by Veriforce (Peoples Natural Gas' representative).

b) For Peoples Equitable Territories:

i) Reestablished Gas Service

A request for service must be made by the customer as soon as the need for service is established.

Applications for service can be found online at the Company's Web Site or by calling the Company (800-654-6335).

ii) Express Service- New Gas Service Request

A request for new service must be made by the customer as soon as the need is established.

Applications for service can be found online at the Company's Web Site or by calling the Company (412-395-2085).

7. INSPECTION AND TIE-IN

I. FOR PNG and PTWP TERRITORIES:

a) Upon receipt of a completed SIR form (for new construction services installed by the builder/developer) and successful verification of the installer's credentials, Peoples will dispatch representatives to process the tie-in request.

i) Repaired and replaced service lines (existing customers) will be scheduled for tie-in as soon as possible, generally the same day (depending on when the request is received), but no later than 24 hours after requested.

ii) New construction service line tie-in requests will be scheduled to be completed within 10 business days.

Peoples
Service Line Installation Standards

- b) Upon arrival, a Peoples representative will inspect the installation against the requirements outlined in this manual, including, but not limited to:
 - i) Verification that Peoples approved materials were used;
 - ii) Verification of valid pressure test;
 - iii) Verification that the service line can be located accurately and/or that the tracer wire is continuous;
 - iv) Verification that the meter manifold is supported properly;
 - v) Verification that exposed houseline is adequately coated to prevent atmospheric corrosion;
- c) For new construction, the installer or customer must schedule an appointment for the connection of the service line and the installation of the meter. Access to the inside of the building must be provided during this appointment to activate the gas service.
 - i) Prior to service activation, Peoples' personnel will verify that there is no leakage.
 - (1) If no leak is found, Peoples personnel will complete the turn-on.
 - (2) If a leak is discovered and can be isolated, Peoples will set the meter, and turn on the service, utilizing a houseline valve upstream of the leak to isolate the leaking section of houseline. Peoples will "Red Tag" the leaking portion of the houseline.
 - (3) If the houseline leaks, but the leak cannot be isolated, Peoples will set the meter, but will lock the meter stop and leave a red tag. A "Live Gas to this Point" tag will also be attached to the locked meter. The customer will be responsible to have the repairs made by a qualified plumber. After the repairs are made, the customer will call Peoples to schedule a turn-on. Another SIR form is not required in this situation as the service line has already been properly tested and activated.
 - ii) If no access is provided, Peoples will cancel the appointment and the customer will be responsible to call Peoples Natural Gas to reschedule the turn-on.
- d) If a customer or their representative schedules a non-emergency field visit and fails to prepare of the Company's arrival, a fee of \$30 may be charged. This fee will be charged if it is necessary for the Company to make a second visit or incur unusual expense as the result. Reasons to charge this fee include, but are not limited to: leaks, material defects or other unsatisfactory conditions which result in the Company's inability to connect the lines. of installers' errors, a service fee may be charged.

II. FOR PEOPLES EQUITABLE TERRITORIES:

a.) General

The Customer's service line must be installed, visually inspected and tested by an Operator Qualified plumber/installer, before gas service is established to a new customer or to a customer whose service has been discontinued for repair, renewal, modification or extension of Customer's service line. The owner or his representative must make known in writing to the Company's inspector at the time of inspection, any hidden, known or suspected defects in violation of or in conflict with the Company's specifications for the piping or Customer's service line trench. Application to the Company for inspection and witnessing of test must be made by the owner of the premises, or his authorized agent, through the Company's appropriate office. The applicant

must specify the time and place where the inspection is desired, and notification must be made sufficiently in advance to permit scheduling by the Company.

- i) Repaired and replaced service lines (existing customers) will be scheduled for tie-in as soon as possible, generally the same day (depending on when the request is received), but no later than 24 hours after requested.
- ii) New construction service line tie-in requests will be scheduled to be completed within 10 business days.

b.) New, Renewed, Reinstated, Temporarily Disconnected or Partially Replaced Service Lines, One and One Half (1 ½") inches in Diameter or Less. (Not for new single meter residential service lines)

1. Before the Customer service line can be placed into service a Company representative must witness a pressure test with air or inert gas. Gas piping, must be free of leaks before being placed in service. All tests must be performed using an approved gauge and method as specified by the Company.

2. When the Company representative arrives, the Customer's service line to be tested must be securely capped, adequately restrained, and have an approved test connection. At the termination of the test, the installer must relieve pressure in the tested line. The tested lines must remain capped, plugged or valved by the installer to prevent entry of water or debris, prior to final connection to Company facilities.

3. The first visit by the Company to inspect the Customer's service line will be without a charge. Leaks, material defects or other unsatisfactory conditions which result in the Company's inability to connect the lines must be corrected by the installer at the owner's expense. If it is necessary for the Company to make a second visit or incur unusual expense as the result of installers' errors, a service fee may be charged.

4. Final connection between the Company's service connection and the Customer's Service Line must be made by a representative of the Company or supervised by Company representative after it has been determined that the Company's specifications have been fully complied with. If a Customer's service line is not in compliance with the Company specifications, the line will not be connected. An additional inspection must be rescheduled subsequent to correction of the faulty condition.

5. Testing Requirements

i) New, renewed, reinstated, temporarily disconnected or partially replaced Customer's service lines operating at 60 psig or less, must be tested at 90 psig for a minimum of 10 minutes. For service lines operating in excess of 60 psig, consult the Company.

ii) Reinstated Customer owned service lines that are connected at the Company curb stop and main line, shall be tested at operating pressure by Company personnel.

c.) Express Service. (For new single residential and small commercial meters only)

1. New construction Customer service line testing, for residential customers, (does not include multi-meter sets or remote sets) does not require a test to be witnessed by a Company representative. The contractor/plumber is required to install the Customer's service line, house line and prefab meter bar. Express Service may only be used for single small commercial meters with loads of 500,000 btu or less.

2. Testing Requirements

New Customer's service lines operating at 60 psig or less must be tested at 90 psig for a minimum of 10 minutes. The contractor/plumber must complete the Equitable Gas Company (Express Service and New Construction Warning Tag) tag, insert the tag into a weatherproof pouch, and attach it to the prefab meter bar.

8. RE-ESTABLISHING GAS SERVICE AFTER A BURIED HOUSE LINE LEAK

The following procedure applies to re-establishing gas service after house line repairs or replacement in all Peoples service territories (Peoples Natural Gas, Peoples EGC and Peoples TWP).

1. If the customer's meter has been locked at the meter valve after discovery of a leak that poses an immediate danger (Grade 1 Leak), the plumber/customer's representative may begin house line repairs without prior notice to Peoples.
2. If the customer's meter has been left on after discovery of a leak that does not pose an immediate danger (Grade 2 Leak), the plumber/customer's representative shall request a meter turn-off prior to the start of house line repairs. Only a Peoples employee shall close the meter valve for house line repairs.
3. Pressure testing for new, renewed, previously abandoned and partially replaced buried house lines from the Company's meter set through the Customer's building shall be performed by a qualified person according to the International and/or National Fuel Gas Codes.
4. The house line pressure test mentioned in Step 3 does not require witnessing or inspection by Peoples personnel.
5. After a successful houseline pressure test has been performed, the plumber/customer representative will notify Peoples that the premise is ready to have gas service reinstated.
6. After Peoples has been notified that the premise is ready for the gas service a qualified Peoples employee will be scheduled to reinstate the gas service according to the following timeframes:
 - a. During heating season (beginning October 15 and ending May 1), a Peoples employee will be dispatched to reinstate the gas service on the same day that the call is received.
 - b. Outside of heating season (beginning May 1 and ending October 14), a Peoples employee will be dispatched to reinstate the gas service during the next business day if the call is received after 2:30 pm.
 - c. Outside of heating season, a Peoples employee will be dispatched to reinstate the gas service on the same day if the call is received prior to 2:30 pm.
 - d. If the call is received on a Friday or the day before a holiday recognized by Peoples, a Peoples employee will be dispatched to reinstate the gas service on the same day that the call is received.
7. Access to the inside of the structure by the Peoples employee is required during the meter turn-on process.

Appendix 1.

Pipe Sizing Charts

**Refer to International Fuel Gas Code for
sizing in excess of the chart limits**

Variables	Units
Atmospheric Pressure	14.7 psia
Gas Specific Gravity	0.6 lb/ft sec
Gas Viscosity	7.39E-06

Inlet Pressure 0.25 psig (7 inches of water column)
Pressure Drop 0.5 inch water column

STEEL PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

Nominal Diameter (inches)	Inside Diameter (inches)	Length of Pipe, (feet)																					
		10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	600	700	800	900	1,000
1/2	0.622	179	120	95	81	71	64	59	54	51	48	42	38	35	32	25	21	19	17	16	14	13	13
3/4	0.824	386	259	205	174	153	138	126	117	109	103	90	81	74	69	55	46	41	37	34	31	29	27
1	1.049	745	500	396	336	295	266	243	225	210	198	174	157	144	133	105	89	79	71	65	60	56	53
1 1/4	1.380	1,572	1,055	836	708	623	561	513	476	444	418	368	331	303	281	222	188	166	149	137	127	118	111
1 1/2	1.610	2,393	1,606	1,272	1,078	948	854	782	724	676	637	560	504	461	427	338	287	252	227	208	193	180	169
2	2.067	4,727	3,173	2,513	2,130	1,874	1,687	1,544	1,430	1,336	1,258	1,106	996	912	844	669	567	499	449	411	380	356	335

Variables	Units
Atmospheric Pressure	14.7 psia
Gas Specific Gravity	0.6 lb/ft sec
Gas Viscosity	7.39E-06

Inlet Pressure 0.25 psig (7 inches of water column)
Pressure Drop 0.5 inch water column

PLASTIC PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

CTS Size (inches)	Nominal Size (inches)	Nominal OD (inches)	Inside Diameter (inches)	Length of Tubing, (feet)																				
				10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	600	700	800	900
3/8 .090 wall CTS Tubing	3/8	0.375	0.251	15	10	8	7	6	5	5	5	4	4	4	3	3	3	2	2	2	1	1	1	1
1/2 .099 wall CTS Tubing	5/8	0.625	0.445	72	48	38	32	29	26	24	22	20	19	17	15	14	13	10	9	8	7	6	6	5
1 .121 wall CTS Tubing	1 1/8	1.125	0.927	532	357	283	240	211	190	174	161	150	141	124	112	103	95	75	64	56	50	46	43	
1 1/4 SDR 11 IPS Pipe (6800 Series)	1 3/8	1.375	1.133	918	617	488	414	364	328	300	278	260	244	215	194	177	164	130	110	97	87	80	74	
2	2 3/8	2.375	1.943	3,994	2,681	2,123	1,800	1,583	1,425	1,304	1,208	1,129	1,063	935	842	770	713	565	479	421	379	347	321	
3	3 1/2	3.500	2.864	11,495	7,717	6,112	5,180	4,556	4,103	3,755	3,477	3,250	3,059	2,690	2,423	2,217	2,053	1,626	1,378	1,212	1,092	999	925	
4	4 1/2	4.500	3.682	22,795	15,302	12,120	10,272	9,035	8,136	7,446	6,896	6,444	6,065	5,335	4,804	4,396	4,072	3,225	2,733	2,404	2,165	1,981	1,835	
6	6 5/8	6.625	5.421	65,409	43,908	34,777	29,475	25,926	23,345	21,365	19,786	18,490	17,404	15,308	13,784	12,615	11,683	9,253	7,842	6,898	6,212	5,685	5,265	
8	8 5/8	8.625	7.057	134,203	90,088	71,354	60,475	53,193	47,899	43,836	40,596	37,938	35,708	31,408	28,282	25,883	23,970	18,985	16,091	14,153	12,745	11,664	10,801	

Flow Rates Calculated using the Mueller Equation

Variables

Units

Variables	Units
Atmospheric Pressure	14.7 psia
Gas Specific Gravity	0.8
Gas Viscosity	7.39E-06 (lb/ft sec)

Inlet Pressure 2 psig

Pressure Drop 0.2 psi

STEEL PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

Nominal Diameter (inches)	Inside Diameter (inches)	Length of Pipe, (feet)																						
		10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000	2,500	3,000
1/2	0.822	759	510	404	342	301	271	248	230	215	202	178	160	148	138	107	91	80	63	54	43	36	32	29
3/4	0.924	1,833	1,098	888	738	647	583	534	494	462	435	382	344	315	292	231	198	172	138	118	92	78	68	61
1	1.049	3,154	2,117	1,677	1,421	1,250	1,128	1,030	954	891	839	738	665	608	563	448	378	333	263	223	177	150	132	119
1 1/4	1.380	6,858	4,470	3,540	3,000	2,639	2,376	2,175	2,014	1,882	1,772	1,558	1,403	1,284	1,189	942	798	702	556	471	373	318	278	251
1 1/2	1.610	10,194	6,803	5,388	4,587	4,017	3,617	3,310	3,088	2,885	2,698	2,372	2,158	1,985	1,810	1,434	1,215	1,089	848	717	568	482	424	381
2	2.067	20,021	13,440	10,848	9,022	7,938	7,148	6,540	6,058	5,680	5,327	4,688	4,219	3,881	3,576	2,832	2,400	2,111	1,672	1,417	1,123	951	837	754

PLASTIC PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

CTS Size (inches) .062 wall	Nominal Size (inches) CTS Tubing	Nominal OD (inches) PE 3408	Inside Diameter (inches)	Length of Pipe, (feet)																				
				10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000
3/8	3/8	0.375	0.251	64	43	34	29	25	23	21	19	18	17	15	13	12	11	9	8	7	5	5	4	3
.090 wall	CTS Tubing	PE 3408																						
1/2	5/8	0.625	0.445	305	205	162	137	121	109	100	92	88	81	71	64	59	54	43	37	32	25	22	17	14
.099 wall	CTS Tubing	PE 2406																						
1	1 1/8	1.125	0.929	2,252	1,511	1,197	1,015	892	804	735	681	638	599	527	474	434	402	319	270	237	188	159	128	107
.121 wall	CTS Tubing	PE 3408																						
1 1/4	1 3/8	1.375	1.133	3,890	2,611	2,068	1,783	1,542	1,388	1,271	1,177	1,100	1,038	910	820	750	695	550	488	410	325	275	218	185
SDR 11	IPS Pipe PE	3408/2406																						
2	2 3/8	2.375	1.943	16,918	11,388	8,993	7,822	6,704	6,097	5,625	5,117	4,782	4,501	3,959	3,585	3,262	3,021	2,393	2,028	1,784	1,413	1,197	948	804
SDR 11	IPS Pipe PE	3408																						
3	3 1/2	3.500	2.884	48,889	32,888	25,887	21,941	19,299	17,378	15,904	14,728	13,784	12,955	11,395	10,281	9,390	8,698	6,888	5,838	5,135	4,087	3,447	2,750	2,314
4	4 1/2	4.500	3.652	98,552	64,814	51,338	43,509	38,270	34,481	31,338	29,207	27,294	25,690	22,598	20,347	18,821	17,248	13,880	11,878	10,182	8,088	6,838	5,414	4,588
5	5 1/8	5.625	5.421	277,044	185,078	147,301	124,843	109,810	98,981	90,494	83,808	78,318	73,714	64,837	58,384	53,432	49,483	39,193	33,217	29,217	23,141	19,813	15,894	13,188
6	6 1/8	6.625	7.057	588,424	381,378	302,223	258,148	225,302	202,878	185,870	171,948	160,888	151,242	133,030	119,790	109,829	101,827	80,413	68,154	59,947	47,480	40,241	31,873	27,013
SDR 11.8	IPS Pipe PE	2406																						
3	3 1/2	3.500	2.888	49,715	33,373	26,433	22,403	19,705	17,744	16,299	15,039	14,084	13,228	11,695	10,477	9,588	8,880	7,033	5,981	5,243	4,153	3,520	2,788	2,363
SDR 13.6	IPS Pipe PE	2406																						
4	4 1/2	4.500	3.834	107,804	72,387	57,318	48,579	42,729	38,477	35,213	32,811	30,475	28,884	25,230	22,719	20,792	19,258	15,281	12,928	11,389	9,008	7,832	6,048	5,123
5	5 1/8	5.625	5.843	309,084	207,470	164,325	139,272	122,501	110,309	100,982	93,481	87,389	82,233	72,331	65,132	59,808	55,202	43,722	37,058	32,594	25,818	21,880	17,330	14,888
6	6 1/8	6.625	7.347	634,386	425,834	337,278	288,587	251,435	228,410	207,208	191,892	179,328	168,788	148,480	133,884	122,348	113,303	90,740	78,059	68,900	52,987	44,909	35,970	30,147

Peoples

Service Line Installation Standards

Atmospheric Pressure	14.7 psia
Gas Specific Gravity	0.8
Gas Viscosity	7.39E-08 lbft sec

Inlet Pressure 5 psig
 Pressure Drop 0.5 psi

STEEL PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

Nominal Diameter (Inches)	Inside Diameter (Inches)	Length of Pipe, (feet)																						
		10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000	2,500	3,000
1/2	0.822	1,408	945	749	655	558	503	460	426	398	375	330	297	272	252	199	169	149	118	100	79	67	59	53
3/4	0.934	3,030	2,034	1,611	1,385	1,201	1,082	990	917	857	808	709	639	584	541	429	363	320	253	215	170	144	127	114
1	1.049	5,350	3,927	3,111	2,636	2,319	2,088	1,911	1,770	1,654	1,557	1,389	1,233	1,128	1,048	828	701	617	489	414	328	278	245	220
1 1/4	1.380	12,352	8,292	6,587	5,588	4,898	4,409	4,035	3,738	3,492	3,287	2,891	2,603	2,382	2,208	1,747	1,481	1,303	1,032	874	693	587	518	465
1 1/2	1.610	18,800	12,820	9,998	8,472	7,452	6,710	6,141	5,687	5,315	5,002	4,400	3,982	3,626	3,358	2,680	2,254	1,983	1,570	1,331	1,054	893	788	708
2	2.067	37,142	24,933	19,748	16,737	14,722	13,257	12,132	11,238	10,500	9,883	8,692	7,827	7,183	6,634	5,254	4,453	3,917	3,102	2,629	2,083	1,765	1,553	1,398

PLASTIC PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

CTS Size (Inches)	Nominal Size (Inches)	Nominal OD (Inches)	Inside Diameter (Inches)	Length of Pipe, (feet)																				
				10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000
3/8	3/8	0.375	0.251	119	80	63	54	47	42	39	36	34	32	28	25	23	21	17	14	13	10	8	7	6
1/2	5/8	0.625	0.445	565	380	301	255	224	202	185	171	160	150	132	119	109	101	80	68	60	47	40	32	27
1	1 1/8	1.125	0.922	4,177	2,804	2,221	1,882	1,658	1,491	1,384	1,284	1,181	1,111	975	880	808	748	591	501	441	349	298	234	199
1 1/4	1 3/8	1.375	1.133	7,217	4,845	3,837	3,252	2,880	2,576	2,357	2,183	2,040	1,920	1,689	1,521	1,392	1,289	1,021	885	761	603	511	405	343
2	2 3/8	2.375	1.943	31,380	21,085	16,884	14,141	12,438	11,200	10,250	9,492	8,871	8,349	7,344	6,613	6,082	5,805	4,439	3,782	3,309	2,821	2,322	1,780	1,491
3	3 1/2	3.500	2.884	90,327	60,838	48,028	40,704	35,802	32,239	29,504	27,334	25,534	24,033	21,139	19,035	17,421	16,133	12,778	10,930	9,526	7,545	6,395	5,085	4,293
4	4 1/2	4.500	3.682	179,120	120,241	95,235	80,718	70,998	63,930	58,508	54,183	50,835	47,859	41,920	37,748	34,548	31,995	25,340	21,478	18,890	14,982	12,881	10,044	8,572
6	6 5/8	6.625	5.421	513,982	348,078	273,287	231,804	203,715	183,440	167,380	155,473	145,292	138,751	120,284	108,313	99,125	91,799	72,709	61,824	54,203	42,931	36,386	28,819	24,425
8	8 5/8	8.625	7.057	1,084,820	707,885	560,874	475,193	417,972	378,373	344,448	318,991	298,102	280,879	248,792	222,230	203,380	188,349	149,180	128,438	111,211	88,084	74,884	59,129	50,114
10	10 1/2	10.500	8.886	2,223,000	1,481,313	1,160,037	975,581	858,557	762,918	701,128	657,899	620,073	584,340	508,585	454,437	417,788	387,473	308,048	264,558	229,727	181,704	153,529	119,172	100,383
12	12 1/2	12.500	10.334	3,999,994	2,666,253	2,108,334	1,770,122	1,552,970	1,391,381	1,285,328	1,204,498	1,138,538	1,072,573	918,805	824,147	767,572	717,221	562,293	483,079	419,092	330,705	281,158	219,214	185,904
16	16 5/8	16.625	13.843	8,793,363	5,861,891	4,608,849	3,928,372	3,427,280	3,048,841	2,801,283	2,634,442	2,500,084	2,382,084	2,048,884	1,852,831	1,724,409	1,611,112	1,268,748	1,084,488	938,893	753,591	631,150	507,248	
20	20 5/8	20.625	17.347	15,176,833	10,119,992	7,958,708	6,703,311	5,888,482	5,200,028	4,744,400	4,455,990	4,202,879	3,975,123	3,418,418	3,068,008	2,802,970	2,601,195	1,998,483	1,711,101	1,471,110	1,218,300	1,003,313	793,988	669,227

Peoples

Service Line Installation Standards

Variable	Units
Atmospheric Pressure	14.7 psia
Gas Specific Gravity	0.8
Gas Viscosity	7.39E-06 (cft sec)

Inlet Pressure 10 psig
 Pressure Drop 1 psi

STEEL PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

Nominal Diameter (Inches)	Inside Diameter (Inches)	Length of Pipe (feet)																						
		10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000	2,500	3,000
1/2	0.822	2,378	1,897	1,265	1,072	943	849	777	719	672	633	557	501	459	425	338	285	251	199	168	133	113	99	90
3/4	0.824	5,118	3,438	2,721	2,308	2,029	1,827	1,672	1,548	1,447	1,362	1,198	1,079	987	914	724	614	540	428	362	287	243	214	193
1	1.049	9,882	6,534	5,254	4,453	3,917	3,527	3,228	2,989	2,793	2,629	2,313	2,082	1,908	1,765	1,395	1,185	1,042	825	700	554	470	413	372
1 1/4	1.380	20,884	14,008	11,093	9,402	8,270	7,447	6,815	6,311	5,898	5,551	4,883	4,397	4,024	3,728	2,952	2,502	2,200	1,743	1,477	1,170	992	872	785
1 1/2	1.610	31,758	21,317	16,884	14,310	12,587	11,334	10,373	9,605	8,977	8,449	7,432	6,692	6,125	5,672	4,492	3,807	3,349	2,853	2,248	1,751	1,509	1,327	1,195
2	2.067	62,737	42,113	33,356	28,271	24,887	22,392	20,492	18,978	17,735	16,693	14,653	13,221	12,100	11,208	8,875	7,522	6,518	5,240	4,441	3,518	2,981	2,622	2,361

PLASTIC PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

CTS Size (Inches) 0.62 wall	Nominal Size (Inches) CTS Tubing	Nominal OD (Inches) PE 3408	Inside Diameter (Inches)	Length of Pipe (feet)																				
				10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000
3/8	3/8	0.375	0.251	201	138	107	90	80	72	66	61	57	53	47	42	39	36	28	24	21	17	14	11	10
.090 wall	CTS Tubing	PE 3408																						
1/2	5/8	0.592	0.445	955	641	508	430	379	341	312	289	270	254	224	201	184	171	135	115	101	80	68	54	48
.099 wall	CTS Tubing	PE 2406																						
1	1 1/8	1.125	0.923	7,055	4,738	3,751	3,179	2,798	2,518	2,305	2,134	1,994	1,877	1,651	1,487	1,381	1,280	998	848	744	589	499	398	335
.121 wall	CTS Tubing	PE 3408																						
1 1/4	1 3/8	1.375	1.133	12,190	8,183	6,481	5,493	4,832	4,351	3,982	3,687	3,448	3,243	2,853	2,589	2,381	2,177	1,724	1,482	1,288	1,018	883	694	579
SDR 11	IPS Pipe PE	360/240																						
2	2 3/8	2.375	1.943	53,004	35,681	28,182	23,885	21,009	18,918	17,313	16,084	14,984	14,103	12,408	11,170	10,223	9,487	7,498	6,355	5,590	4,427	3,752	2,972	2,519
SDR 11	IPS Pipe PE	3408																						
3	3 1/2	3.500	2.884	182,572	122,419	91,120	76,753	68,474	64,455	49,838	46,153	43,130	40,595	36,707	32,153	29,428	27,251	21,584	18,293	16,090	12,744	10,801	8,555	7,251
4	4 1/2	4.500	3.682	302,552	203,099	150,883	128,338	119,920	107,085	98,828	91,522	85,529	80,501	70,807	63,760	58,352	54,039	42,801	36,278	31,908	25,272	21,419	16,985	14,378
5	5 1/8	5.525	5.421	688,138	452,769	341,577	291,205	244,097	209,680	193,868	182,810	165,414	150,958	133,173	122,982	107,433	100,089	72,513	60,089	51,555	39,515	31,459	24,978	21,257
SDR 11.5	IPS Pipe PE	2406																						
5	5 5/8	6.525	7.057	1,751,198	1,128,894	847,035	702,853	608,000	535,734	481,809	438,810	403,527	375,928	318,559	275,370	243,530	218,141	161,281	133,584	107,847	88,783	69,878	54,849	
SDR 13.5	IPS Pipe PE	2406																						
5	3 1/2	3.500	2.888	185,787	124,577	92,830	79,201	67,748	66,802	50,888	47,125	44,039	41,481	36,459	32,830	30,048	27,825	22,039	18,879	16,429	13,013	11,029	8,735	7,404
SDR 13.5	IPS Pipe PE	2406																						
6	4 1/2	4.500	3.834	337,811	228,768	179,810	152,228	133,898	120,589	110,343	102,187	95,498	89,882	79,059	71,190	65,152	60,337	47,789	40,503	35,828	28,217	23,915	18,942	16,084
6	5 1/8	6.525	5.643	988,472	650,122	514,923	438,478	383,888	348,681	318,341	292,981	273,775	257,884	228,854	204,098	188,764	172,980	137,007	118,119	102,138	80,898	68,583	54,304	46,023
6	5 5/8	6.925	7.347	1,287,728	834,381	658,884	565,752	487,888	429,472	389,293	351,306	321,931	298,898	258,210	228,009	203,375	188,042	141,208	120,535	103,835	80,040	68,725	54,480	

Peoples

Service Line Installation Standards

Atmospheric Pressure	14.7 psia
Gas Specific Gravity	0.8
Gas Viscosity	7.39E-08 lb/ft sec

Inlet Pressure 20 psig
Pressure Drop 2 psi

STEEL PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

Nominal Diameter (Inches)	Inside Diameter (Inches)											Length of Pipe, (feet)												
		10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000	2,500	3,000
1/2	0.622	4,288	2,877	2,279	1,932	1,699	1,530	1,400	1,297	1,212	1,140	1,003	903	827	768	808	514	452	358	303	240	204	179	161
3/4	0.824	9,224	6,192	4,904	4,156	3,658	3,292	3,013	2,790	2,607	2,454	2,159	1,944	1,779	1,647	1,305	1,106	973	770	653	517	438	386	347
1	1.049	17,808	11,954	9,468	8,025	7,059	6,358	5,817	5,387	5,034	4,738	4,168	3,753	3,435	3,181	2,519	2,135	1,878	1,488	1,261	999	848	744	670
1 1/4	1.380	37,599	25,240	19,991	16,943	14,903	13,420	12,281	11,374	10,629	10,004	8,799	7,924	7,252	6,716	5,319	4,508	3,965	3,141	2,662	2,108	1,787	1,572	1,415
1 1/2	1.610	57,229	38,416	30,427	25,788	22,683	20,425	18,893	17,311	16,178	15,227	13,399	12,080	11,037	10,222	8,098	6,862	6,035	4,780	4,051	3,209	2,720	2,392	2,154
2	2.087	113,080	75,898	60,113	50,948	44,813	40,353	36,930	34,201	31,981	30,082	26,480	23,826	21,805	20,194	15,994	13,568	11,923	9,444	8,004	6,340	5,373	4,728	4,258

PLASTIC PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

CTS Size (Inches) <i>.062 wall</i>	Nominal Size (Inches) <i>CTS Tubing</i>	Nominal OD (Inches) <i>PE 3408</i>	Inside Diameter (Inches)	Length of Pipe, (feet)																				
				10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000
3/8	3/8	0.375	0.251	362	243	192	163	143	129	118	109	102	96	85	76	70	65	51	43	38	30	26	20	17
.090 wall	CTS Tubing	PE 3408																						
1/2	5/8	0.625	0.445	1,721	1,155	915	776	682	614	562	521	487	458	403	363	332	307	243	206	182	144	122	97	82
.099 wall	CTS Tubing	PE 2406																						
1	1 1/8	1.125	0.927	12,715	8,535	6,780	5,729	5,040	4,538	4,153	3,846	3,594	3,383	2,978	2,679	2,452	2,271	1,799	1,524	1,341	1,062	900	713	604
.121 wall	CTS Tubing	PE 3408																						
1 1/4	1 3/8	1.375	1.133	21,968	14,747	11,680	9,899	8,707	7,841	7,178	6,645	6,210	5,845	5,141	4,629	4,237	3,924	3,108	2,634	2,317	1,835	1,555	1,232	1,044
SDR 11	IPS Pipe	PE 3408/2406																						
2	2 3/8	2.375	1.943	95,520	64,122	50,787	43,044	37,861	34,093	31,201	28,895	27,003	25,415	22,355	20,130	18,423	17,061	13,513	11,453	10,074	7,979	6,762	5,356	4,539
SDR 11	IPS Pipe	PE 3408																						
3	3 1/2	3.500	2.864	274,954	184,573	148,189	123,901	108,981	98,135	89,811	83,173	77,727	73,158	64,348	57,944	53,029	49,110	38,897	32,967	28,997	22,967	19,485	15,417	13,067
4	4 1/2	4.500	3.682	545,238	366,011	289,898	245,698	216,112	194,803	178,096	164,934	154,133	145,073	127,604	114,904	105,157	97,385	77,133	65,374	57,501	45,543	38,600	30,573	25,912
6	6 5/8	6.625	5.421	1,584,496	1,050,224	831,820	705,001	620,107	558,390	511,028	473,258	442,267	416,269	366,143	329,702	301,738	279,436	221,325	187,581	164,993	130,682	110,758	87,725	74,350
8	8 5/8	8.625	7.057	3,209,946	2,154,793	1,706,684	1,446,483	1,272,301	1,145,673	1,048,495	971,004	907,420	854,078	751,233	676,465	619,086	573,331	454,102	384,869	338,524	268,125	227,247	179,989	152,548
SDR 11.5	IPS Pipe	PE 2406																						
3	3 1/2	3.500	2.866	280,747	188,462	149,269	126,512	111,278	100,202	91,703	84,926	79,364	74,899	65,704	59,165	54,148	50,144	39,716	33,681	29,608	23,451	19,875	15,742	13,342
SDR 13.5	IPS Pipe	PE 2406																						
4	4 1/2	4.500	3.834	608,779	408,665	323,680	274,331	241,297	217,282	198,851	184,155	172,096	161,979	142,474	128,294	117,412	108,735	86,122	72,992	64,203	50,851	43,098	34,136	28,931
6	6 5/8	6.625	5.643	1,745,311	1,171,603	927,958	788,481	691,775	622,925	570,087	527,954	493,362	464,379	408,460	367,807	336,609	311,731	246,904	209,261	184,062	145,785	123,559	97,863	82,943
8	8 5/8	8.625	7.347	3,582,266	2,404,726	1,904,641	1,614,259	1,419,875	1,278,559	1,170,109	1,083,630	1,012,671	953,142	838,368	754,928	690,893	639,831	506,773	429,510	377,790	299,225	253,605	200,865	170,242

Peoples

Service Line Installation Standards

Variables	Units
Atmospheric Pressure	14.7 psia
Gas Specific Gravity	0.8
Gas Viscosity	7.39E-06 lb/ft sec

Inlet Pressure 30 psig
Pressure Drop 3 psi

STEEL PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

Nominal Diameter (Inches)	Inside Diameter (Inches)	Length of Pipe, (feet)																							
		10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000	2,500	3,000	
1/2	0.622	8,242	4,190	3,319	2,813	2,474	2,228	2,039	1,888	1,765	1,661	1,481	1,316	1,204	1,115	883	748	658	521	442	350	297	261	235	
3/4	0.824	13,433	9,017	7,142	6,053	5,324	4,794	4,388	4,064	3,797	3,574	3,144	2,831	2,591	2,399	1,900	1,611	1,417	1,122	951	753	638	562	506	
1	1.049	25,935	17,410	13,789	11,687	10,280	9,257	8,471	7,845	7,332	6,901	6,070	5,468	5,002	4,632	3,689	3,110	2,735	2,168	1,836	1,454	1,233	1,084	978	
1 1/4	1.380	54,758	36,758	29,114	24,675	21,704	19,544	17,886	16,564	15,480	14,570	12,815	11,540	10,561	9,780	7,746	6,565	5,775	4,574	3,877	3,070	2,602	2,289	2,061	
1 1/2	1.610	83,344	55,948	44,313	37,557	33,035	29,747	27,224	25,212	23,661	22,178	19,505	17,564	16,074	14,888	11,790	9,993	8,790	6,962	5,900	4,873	3,961	3,484	3,137	
2	2.067	184,657	110,532	87,546	74,198	65,264	58,768	53,783	49,808	46,547	43,811	38,535	34,700	31,756	29,409	23,293	19,742	17,365	13,754	11,657	9,233	7,825	6,883	6,198	

PLASTIC PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

CTS Size (Inches)	Nominal Size (Inches)	Nominal OD (Inches)	Inside Diameter (Inches)	Length of Pipe, (feet)																				
				10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000
.062 wall	CTS Tubing	PE 3408																						
3/8	3/8	0.375	0.251	526	353	280	237	209	188	172	159	149	140	123	111	102	94	74	63	56	44	37	30	25
.090 wall	CTS Tubing	PE 3408																						
1/2	5/8	0.625	0.445	2,508	1,683	1,333	1,129	993	895	819	758	709	667	587	528	483	448	355	301	264	209	177	141	119
.099 wall	CTS Tubing	PE 2406																						
1	1 1/8	1.125	0.927	18,517	12,430	9,845	8,344	7,339	6,609	6,048	5,601	5,235	4,927	4,334	3,902	3,571	3,307	2,620	2,220	1,953	1,547	1,311	1,038	880
.121 wall	CTS Tubing	PE 3408																						
1 1/4	1 3/8	1.375	1.133	31,993	21,478	17,010	14,417	12,681	11,419	10,450	9,678	9,044	8,512	7,487	6,742	6,170	5,714	4,528	3,836	3,374	2,872	2,285	1,794	1,520
SDR 11	IPS Pipe PE	3408/2406																						
2	2 3/8	2.375	1.943	139,112	93,384	73,984	62,687	55,139	49,851	45,439	42,081	39,328	37,014	32,557	29,317	26,830	24,847	19,880	16,679	14,871	11,820	9,848	7,800	6,611
SDR 11	IPS Pipe PE	3408																						
3	3 1/2	3.500	2.884	400,431	268,804	212,904	180,444	158,718	142,919	130,797	121,130	113,198	106,544	93,714	84,387	77,229	71,521	56,848	48,011	42,230	33,448	28,348	22,453	19,030
4	4 1/2	4.500	3.682	794,063	533,043	422,192	357,825	314,736	283,412	259,372	240,203	224,474	211,278	185,837	167,341	153,147	141,828	112,334	95,207	83,743	66,328	56,215	44,525	37,737
6	6 5/8	6.625	5.421	2,278,467	1,529,504	1,211,429	1,026,736	903,098	813,216	744,237	689,233	644,100	606,237	533,236	480,165	439,436	406,959	322,328	273,188	240,290	190,319	161,303	127,759	108,281
8	8 5/8	8.625	7.057	4,674,834	3,138,152	2,485,544	2,108,598	1,852,928	1,668,512	1,528,985	1,414,130	1,321,529	1,243,845	1,094,085	985,176	901,611	834,976	661,335	560,508	493,013	390,486	330,953	262,128	222,164
SDR 11.5	IPS Pipe PE	2406																						
3	3 1/2	3.500	2.886	408,869	274,468	217,390	184,247	162,060	145,931	133,553	123,682	115,583	108,789	95,689	86,165	78,856	73,028	57,841	49,023	43,120	34,153	28,946	22,926	19,431
SDR 13.5	IPS Pipe PE	2406																						
4	4 1/2	4.500	3.834	886,601	595,163	471,394	399,525	351,415	316,440	289,599	268,196	250,833	235,900	207,494	186,843	170,994	158,357	125,425	106,303	93,502	74,057	62,767	49,714	42,134
6	6 5/8	6.625	5.843	2,541,799	1,706,275	1,351,439	1,145,399	1,007,473	907,203	830,252	768,891	718,541	676,303	594,864	535,659	490,224	453,993	359,581	304,759	268,081	212,315	179,946	142,524	120,795
8	8 5/8	8.625	7.347	5,217,065	3,502,144	2,773,841	2,350,941	2,087,847	1,862,041	1,704,099	1,578,154	1,474,812	1,388,118	1,220,984	1,099,446	1,006,189	931,824	738,043	625,521	550,197	435,779	369,340	292,532	247,933

Peoples

Service Line Installation Standards

Atmospheric Pressure	14.7 psia
Gas Specific Gravity	0.8
Gas Viscosity	7.39E-06 lb/ft sec

Inlet Pressure 40 psig
Pressure Drop 4 psi

STEEL PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

Nominal Diameter (Inches)	Inside Diameter (Inches)	Length of Pipe, (feet)																						
		10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000	2,500	3,000
1/2	0.822	8,257	5,543	4,390	3,721	3,273	2,947	2,697	2,498	2,334	2,197	1,932	1,740	1,593	1,475	1,168	990	871	690	585	483	392	345	311
3/4	0.824	17,769	11,928	9,447	8,007	7,043	6,342	5,804	5,375	5,023	4,728	4,158	3,745	3,427	3,174	2,514	2,130	1,874	1,484	1,258	998	844	743	689
1	1.049	34,306	23,029	18,240	15,459	13,598	12,244	11,208	10,377	9,698	9,128	8,029	7,230	6,616	6,127	4,853	4,113	3,618	2,868	2,429	1,924	1,630	1,434	1,291
1 1/4	1.380	72,431	48,622	38,511	32,639	28,709	25,852	23,659	21,910	20,476	19,272	16,951	15,264	13,969	12,937	10,247	8,684	7,639	6,050	5,128	4,081	3,442	3,028	2,726
1 1/2	1.610	110,244	74,005	58,615	49,879	43,697	39,348	36,010	33,349	31,165	29,333	25,801	23,233	21,262	19,691	15,998	13,218	11,626	9,209	7,805	6,182	5,239	4,608	4,150
2	2.067	217,800	146,206	115,901	98,146	86,327	77,736	71,142	65,984	61,570	57,950	50,972	45,899	42,006	38,901	30,811	26,114	22,989	18,193	15,419	12,212	10,351	9,104	8,198

PLASTIC PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

CTS Size (Inches)	Nominal Size (Inches)	Nominal OD (Inches)	Inside Diameter (Inches)	Length of Pipe, (feet)																				
				10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000
.062 wall	CTS Tubing	PE 3408	0.251	696	467	370	314	276	249	227	211	197	185	163	147	134	124	99	83	73	58	49	39	33
.090 wall	CTS Tubing	PE 3408	0.445	3,315	2,226	1,763	1,494	1,314	1,183	1,083	1,003	937	882	776	699	639	592	469	398	350	277	235	186	158
.099 wall	CTS Tubing	PE 2406	0.927	24,493	16,442	13,023	11,037	9,708	8,742	8,000	7,409	6,924	6,517	5,732	5,162	4,724	4,375	3,465	2,937	2,583	2,046	1,734	1,373	1,164
.121 wall	CTS Tubing	PE 3408	1.133	42,319	28,408	22,500	19,070	16,773	15,104	13,823	12,801	11,983	11,260	9,904	8,918	8,162	7,559	5,987	5,074	4,463	3,535	2,996	2,373	2,011
SDR 11	IPS Pipe	PE 3408/2406	1.943	184,010	123,624	97,836	82,920	72,935	65,676	60,105	55,663	52,018	48,960	43,064	38,778	35,489	32,866	26,031	22,063	19,408	15,370	13,027	10,318	8,745
SDR 11	IPS Pipe	PE 3408	2.864	529,670	355,560	281,618	238,683	209,941	189,048	173,011	160,224	149,733	140,931	123,960	111,623	102,155	94,605	74,931	63,507	55,860	44,243	37,498	29,700	25,172
4	4 1/2	4.500	3.682	1,050,346	705,083	558,454	473,312	416,318	374,883	343,084	317,728	296,922	279,468	245,815	221,350	202,575	187,603	148,589	125,935	110,771	87,735	74,359	58,895	49,916
6	6 5/8	6.625	5.421	3,013,842	2,023,151	1,602,418	1,358,113	1,194,573	1,075,881	984,440	911,683	851,983	801,901	705,338	635,138	581,284	538,305	426,369	361,357	317,843	251,745	213,364	168,993	143,228
8	8 5/8	8.625	7.057	6,183,636	4,150,990	3,287,753	2,786,503	2,450,960	2,207,024	2,019,819	1,870,541	1,748,053	1,645,296	1,447,174	1,303,141	1,192,608	1,104,464	874,781	741,412	652,133	516,518	437,768	346,730	293,868
SDR 11.5	IPS Pipe	PE 2406	2.888	540,831	363,052	287,552	243,712	214,365	193,030	176,657	163,601	152,888	143,900	126,572	113,975	104,307	96,598	76,510	64,845	57,037	45,175	38,288	30,326	25,702
SDR 13.5	IPS Pipe	PE 2406	3.834	1,172,752	787,252	623,536	528,472	464,835	418,571	383,067	354,758	331,525	312,037	274,462	247,146	226,183	209,468	165,906	140,612	123,680	97,959	83,024	65,759	55,733
8	8 5/8	8.625	5.643	3,362,165	2,266,975	1,787,616	1,515,076	1,332,635	1,200,002	1,098,216	1,017,050	950,451	894,580	786,857	708,544	648,443	600,519	475,636	403,120	354,578	280,840	238,023	188,524	159,782
8	8 5/8	8.625	7.347	6,900,872	4,632,480	3,669,097	3,109,707	2,735,245	2,483,015	2,264,097	2,087,504	1,950,808	1,836,132	1,615,030	1,454,292	1,330,936	1,232,570	976,248	827,408	727,773	576,428	488,544	388,947	327,953

Peoples

Service Line Installation Standards

Variables	Units
Atmospheric Pressure	14.7 psia
Gas Specific Gravity	0.8
Gas Viscosity	7.39E-06 lb/ft sec

Inlet Pressure 50 psig
Pressure Drop 5 psi

STEEL PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

Nominal Diameter (Inches)	Inside Diameter (Inches)	Length of Pipe (feet)																						
		10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000	2,500	3,000
1/2	0.622	10,326	6,932	5,490	4,653	4,093	3,686	3,373	3,124	2,919	2,748	2,417	2,176	1,992	1,844	1,461	1,238	1,069	863	731	579	491	432	389
3/4	0.824	22,221	14,917	11,815	10,013	8,808	7,931	7,258	6,722	6,282	5,912	5,200	4,683	4,286	3,969	3,144	2,684	2,343	1,856	1,573	1,248	1,056	929	836
1	1.049	42,902	28,800	22,810	19,333	17,005	15,312	14,014	12,978	12,128	11,415	10,041	9,041	8,274	7,663	6,069	5,144	4,525	3,584	3,037	2,406	2,039	1,793	1,615
1 1/4	1.380	90,581	60,806	48,181	40,818	35,903	32,330	29,587	27,401	25,806	24,101	21,199	19,089	17,470	16,179	12,814	10,861	9,553	7,566	6,413	5,079	4,305	3,786	3,410
1 1/2	1.610	137,869	92,549	73,303	62,127	54,646	49,207	45,033	41,705	38,974	36,683	32,266	29,055	26,590	24,625	19,504	16,530	14,540	11,516	9,760	7,731	6,552	5,763	5,189
2	2.067	272,376	182,842	144,818	122,739	107,959	97,215	88,969	82,393	76,998	72,472	63,745	57,401	52,532	48,649	38,632	32,658	28,725	22,751	19,283	15,273	12,944	11,386	10,252

PLASTIC PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

CTS Size (Inches)	Nominal Size (Inches)	Nominal OD (Inches)	Inside Diameter (Inches)	Length of Pipe (feet)																				
				10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000
.062 wall	CTS Tubing	PE 3406																						
3/8	3/8	0.375	0.251	871	585	463	392	345	311	284	263	246	232	204	184	168	156	123	104	92	73	62	49	41
.090 wall	CTS Tubing	PE 3406																						
1/2	5/8	0.625	0.445	4,146	2,783	2,204	1,868	1,643	1,480	1,354	1,254	1,172	1,103	970	874	800	741	587	497	437	348	294	232	197
.099 wall	CTS Tubing	PE 2406																						
1	1 1/8	1.125	0.927	30,631	20,662	16,286	13,803	12,141	10,933	10,006	9,266	8,659	8,150	7,169	6,455	5,908	5,471	4,333	3,673	3,230	2,559	2,168	1,718	1,466
.121 wall	CTS Tubing	PE 3406																						
1 1/4	1 3/8	1.375	1.133	52,923	35,526	28,138	23,848	20,977	18,889	17,287	16,009	14,961	14,081	12,386	11,153	10,207	9,453	7,487	6,345	5,581	4,421	3,747	2,967	2,515
SDR 11	IPS Pipe PE	3408/2406																						
2	2 3/8	2.375	1.943	230,120	154,476	122,352	103,698	91,211	82,133	76,166	69,611	65,063	61,229	53,856	48,496	44,382	41,102	32,554	27,591	24,269	19,222	16,291	12,903	10,936
SDR 11	IPS Pipe PE	3408																						
3	3 1/2	3.500	2.884	662,395	444,657	352,166	298,492	262,548	238,418	216,364	200,374	187,263	176,245	155,022	139,593	127,753	118,311	93,707	79,421	69,657	55,330	46,894	37,142	31,479
4	4 1/2	4.500	3.682	1,313,542	881,763	698,392	591,915	520,639	468,821	429,055	397,345	371,325	349,497	307,412	276,816	253,336	234,613	185,823	157,492	138,528	109,720	92,992	73,653	62,424
6	6 5/8	6.625	5.421	3,789,052	2,530,113	2,003,952	1,698,430	1,493,910	1,345,226	1,231,121	1,140,133	1,065,474	1,002,841	882,082	794,291	726,918	673,193	533,197	451,908	397,488	314,827	266,828	211,339	179,118
8	8 5/8	8.625	7.057	7,733,134	5,191,147	4,111,600	3,484,745	3,065,122	2,780,060	2,525,947	2,339,262	2,186,080	2,057,574	1,809,807	1,629,683	1,491,450	1,381,221	1,093,984	927,195	815,545	645,945	547,484	433,614	367,505
SDR 11.5	IPS Pipe PE	2406																						
3	3 1/2	3.500	2.886	676,353	454,026	359,807	304,782	268,081	241,399	220,923	204,596	191,198	179,959	158,289	142,535	130,445	120,804	95,682	81,094	71,329	56,495	47,882	37,925	32,143
SDR 13.5	IPS Pipe PE	2406																						
4	4 1/2	4.500	3.934	1,466,620	984,622	779,782	660,898	581,313	523,457	479,056	443,651	414,599	390,227	343,237	309,076	282,860	261,954	207,478	175,846	154,671	122,506	103,829	82,237	69,699
6	6 5/8	6.625	5.643	4,204,667	2,822,529	2,235,558	1,894,725	1,666,567	1,500,699	1,373,407	1,271,903	1,188,615	1,118,744	984,028	886,091	810,931	750,997	594,820	504,134	443,428	351,213	297,667	235,764	199,820
8	8 5/8	6.625	7.347	8,630,095	5,793,264	4,588,501	3,888,939	3,420,644	3,080,198	2,818,930	2,610,591	2,439,642	2,296,231	2,019,725	1,818,709	1,664,442	1,541,428	1,220,874	1,034,740	910,139	720,867	610,964	483,908	410,132

Peoples

Service Line Installation Standards

Atmospheric Pressure	14.7 psia
Gas Specific Gravity	0.6
Gas Viscosity	7.39E-06 lb/ft sec

Inlet Pressure 60 psig
Pressure Drop 6 psi

STEEL PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

Nominal Diameter (inches)	Inside Diameter (inches)	Length of Pipe, (feet)										Length of Pipe, (feet)												
		10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000	2,500	3,000
1/2	0.622	12,444	8,354	6,618	5,808	4,932	4,442	4,065	3,764	3,518	3,311	2,912	2,622	2,400	2,223	1,780	1,492	1,312	1,039	881	698	591	520	488
3/4	0.824	28,779	17,978	14,238	12,087	10,614	9,558	8,747	8,101	7,570	7,125	6,287	5,643	5,185	4,783	3,788	3,211	2,824	2,237	1,898	1,502	1,273	1,119	1,008
1	1.049	51,701	34,708	27,489	23,298	20,492	18,453	16,888	15,840	14,815	13,758	12,100	10,896	9,971	9,234	7,314	6,199	5,452	4,319	3,660	2,899	2,457	2,161	1,948
1 1/4	1.380	109,159	73,277	58,038	49,190	43,268	38,980	36,656	33,020	30,858	29,044	25,547	23,004	21,053	19,497	15,442	13,088	11,512	9,118	7,728	6,121	5,188	4,563	4,109
1 1/2	1.610	168,148	111,531	88,337	74,870	65,854	59,300	54,270	50,259	46,968	44,207	38,884	35,014	32,044	29,675	23,504	19,921	17,522	13,878	11,762	9,318	7,898	6,945	6,254
2	2.067	328,240	220,343	174,521	147,913	130,102	117,153	107,218	99,292	92,790	87,336	76,819	69,173	63,308	58,627	46,435	39,356	34,617	27,418	23,238	18,405	15,699	13,721	12,355

PLASTIC PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

CTS Size (inches)	Nominal Size (inches)	Nominal OD (inches)	Inside Diameter (inches)	Length of Pipe, (feet)																				
				10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000
.062 wall	CTS Tubing	PE 3408																						
3/8	3/8	0.375	0.251	1,050	705	558	473	418	375	343	317	297	279	248	221	202	187	148	126	111	88	74	59	50
.090 wall	CTS Tubing	PE 3408																						
1/2	5/8	0.625	0.445	4,997	3,354	2,657	2,252	1,980	1,783	1,632	1,511	1,412	1,329	1,169	1,053	964	892	707	599	527	417	354	280	237
.099 wall	CTS Tubing	PE 2406																						
1	1 1/8	1.125	0.927	36,913	24,779	19,626	16,634	14,631	13,175	12,057	11,168	10,435	9,822	8,639	7,779	7,119	6,593	5,222	4,426	3,893	3,083	2,613	2,070	1,754
.121 wall	CTS Tubing	PE 3408																						
1 1/4	1 3/8	1.375	1.133	63,777	42,813	33,909	28,740	25,279	22,783	20,832	19,293	18,029	16,969	14,926	13,440	12,300	11,391	9,022	7,647	6,728	5,327	4,515	3,578	3,031
SDR 11	IPS Pipe	PE 3408/2406																						
2	2 3/8	2.375	1.943	277,318	186,159	147,448	124,968	109,918	98,978	90,583	83,888	78,395	73,787	64,901	58,442	53,485	49,532	39,231	33,260	29,248	23,184	19,633	15,550	13,179
SDR 11	IPS Pipe	PE 3408																						
3	3 1/2	3.500	2.864	798,253	535,858	424,420	359,713	316,397	284,907	260,741	241,470	225,658	212,393	186,817	168,224	153,955	142,577	112,926	95,710	84,185	68,678	56,512	44,760	37,936
4	4 1/2	4.500	3.682	1,582,960	1,062,613	841,633	713,317	627,422	564,976	517,064	478,840	447,484	421,180	370,462	333,591	305,296	282,732	223,935	189,794	166,940	132,223	112,084	88,759	75,227
6	6 5/8	6.625	5.421	4,542,088	3,049,040	2,414,964	2,046,779	1,800,311	1,621,132	1,483,625	1,373,974	1,284,003	1,208,624	1,082,997	957,200	876,009	811,268	642,556	544,592	479,013	379,398	321,555	254,685	215,856
8	8 5/8	8.625	7.057	9,319,204	6,255,853	4,954,891	4,199,468	3,693,780	3,326,150	3,044,020	2,819,045	2,634,448	2,479,584	2,180,999	1,963,932	1,797,347	1,664,511	1,318,360	1,117,363	982,813	778,428	659,749	522,548	442,881
SDR 11.5	IPS Pipe	PE 2406																						
3	3 1/2	3.500	2.886	815,073	547,147	433,363	367,292	323,084	290,911	266,235	246,558	230,413	216,869	190,754	171,769	157,199	145,581	115,306	97,728	85,958	68,083	57,703	45,703	38,735
SDR 13.5	IPS Pipe	PE 2406																						
4	4 1/2	4.500	3.834	1,767,425	1,186,448	939,715	798,446	700,540	630,818	577,311	534,643	499,834	470,263	413,635	372,468	340,874	315,681	250,032	211,912	186,395	147,632	125,124	99,103	83,994
6	6 5/8	6.625	5.643	5,067,035	3,401,431	2,694,072	2,283,334	2,008,381	1,808,493	1,655,093	1,532,771	1,432,400	1,348,199	1,185,852	1,067,828	977,253	905,027	716,818	607,532	534,375	423,247	358,719	284,120	240,803
8	8 5/8	8.625	7.347	10,400,132	6,981,466	5,529,805	4,686,562	4,122,219	3,711,948	3,397,093	3,146,025	2,940,014	2,767,189	2,433,972	2,191,727	2,005,820	1,857,578	1,471,276	1,246,965	1,096,809	888,718	736,273	583,158	494,250

Peoples

Service Line Installation Standards

Variables	Units
Atmospheric Pressure	14.7 psia
Gas Specific Gravity	0.8
Gas Viscosity	7.39E-06 lb/ft sec

Inlet Pressure 70 psig
Pressure Drop 7 psi

STEEL PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

Nominal Diameter (Inches)	Inside Diameter (Inches)	Length of Pipe (feet)																							
		10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000	2,500	3,000	
1/2	0.622	14,806	9,805	7,766	6,562	5,789	5,213	4,771	4,418	4,129	3,886	3,418	3,078	2,817	2,609	2,068	1,751	1,540	1,220	1,034	819	694	611	550	
3/4	0.824	31,431	21,099	16,711	14,164	12,458	11,218	10,267	9,508	8,885	8,363	7,356	6,624	6,062	5,614	4,446	3,769	3,315	2,625	2,225	1,762	1,494	1,314	1,183	
1	1.049	60,683	40,736	32,264	27,345	24,052	21,859	19,821	18,357	17,155	16,148	14,202	12,788	11,704	10,839	8,585	7,278	6,400	5,069	4,296	3,403	2,884	2,537	2,284	
1 1/4	1.380	128,122	86,007	68,121	57,735	50,783	45,729	41,850	38,757	36,219	34,090	29,985	27,001	24,710	22,884	18,125	15,382	13,512	10,702	9,070	7,184	6,089	5,356	4,823	
1 1/2	1.610	195,009	130,907	103,684	87,876	77,294	69,601	63,698	58,990	55,127	51,887	45,639	41,096	37,610	34,831	27,587	23,381	20,566	16,289	13,808	10,935	9,268	8,152	7,340	
2	2.067	385,283	258,622	204,839	173,609	152,704	137,506	125,842	116,542	108,910	102,508	90,164	81,190	74,304	68,812	54,602	46,193	40,630	32,181	27,275	21,603	18,309	16,104	14,501	

PLASTIC PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

CTS Size (Inches)	Nominal Size (Inches)	Nominal OD (Inches)	Inside Diameter (Inches)	Length of Pipe (feet)																				
				10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000
.062 wall	CTS Tubing	PE 3408																						
3/8	3/8	0.375	0.251	1,232	827	655	555	488	440	402	373	348	328	288	280	238	220	174	148	130	103	87	69	59
.090 wall	CTS Tubing	PE 3408																						
1/2	5/8	0.625	0.445	5,865	3,937	3,118	2,643	2,324	2,093	1,916	1,774	1,658	1,560	1,373	1,236	1,131	1,047	830	703	618	490	415	329	279
.099 wall	CTS Tubing	PE 2406																						
1	1 1/8	1.125	0.927	43,326	29,084	23,036	19,524	17,173	15,484	14,152	13,108	12,248	11,528	10,140	9,130	8,356	7,738	6,129	5,195	4,569	3,619	3,067	2,429	2,059
.121 wall	CTS Tubing	PE 3408																						
1 1/4	1 3/8	1.375	1.133	74,857	50,250	39,800	33,732	29,670	26,717	24,451	22,644	21,161	19,917	17,519	15,775	14,437	13,370	10,590	8,975	7,894	6,253	5,299	4,197	3,557
SDR 11	IPS Pipe PE	3408/2406																						
2	2 3/8	2.375	1.943	325,494	218,500	173,061	148,678	129,014	116,173	106,319	98,461	92,014	86,605	76,176	68,595	62,776	58,137	46,047	39,026	34,327	27,188	23,043	18,251	15,469
SDR 11	IPS Pipe PE	3408																						
3	3 1/2	3.500	2.884	936,928	628,947	498,151	422,203	371,363	334,402	306,038	283,419	264,860	249,291	219,272	197,448	180,700	167,345	132,544	112,337	98,609	78,261	66,329	52,536	44,526
4	4 1/2	4.500	3.682	1,857,945	1,247,213	987,844	837,237	736,419	663,126	606,878	562,026	525,223	494,348	434,820	391,544	358,332	331,849	262,838	222,766	195,941	155,193	131,532	104,179	88,296
6	6 5/8	6.625	5.421	5,331,151	3,579,728	2,834,499	2,402,351	2,113,067	1,902,760	1,741,364	1,612,665	1,507,063	1,418,473	1,247,664	1,123,488	1,026,192	952,201	754,182	639,200	562,229	445,308	377,417	298,929	253,355
8	8 5/8	8.625	7.057	10,938,164	7,342,639	5,815,669	4,929,013	4,335,475	3,903,979	3,572,836	3,308,778	3,092,110	2,910,345	2,559,889	2,305,112	2,109,588	1,953,674	1,547,390	1,311,475	1,153,551	913,659	774,363	613,327	519,819
SDR 11.5	IPS Pipe PE	2406																						
3	3 1/2	3.500	2.888	956,670	642,199	508,648	431,100	379,188	341,448	312,486	289,391	270,441	254,544	223,892	201,609	184,508	170,872	135,337	114,704	100,891	79,910	67,727	53,643	45,464
SDR 13.5	IPS Pipe PE	2406																						
4	4 1/2	4.500	3.934	2,074,467	1,392,561	1,102,968	934,807	822,240	740,405	677,603	627,523	586,431	551,959	485,493	437,174	400,092	370,522	293,469	248,727	218,776	173,279	146,861	116,320	99,586
6	6 5/8	6.625	5.643	5,947,295	3,992,337	3,162,094	2,680,001	2,357,283	2,122,670	1,942,621	1,799,048	1,681,241	1,582,412	1,391,862	1,253,335	1,147,024	1,062,251	841,346	713,075	627,208	496,774	421,036	333,478	282,636
8	8 5/8	8.625	7.347	12,206,874	8,194,307	6,490,225	5,500,725	4,838,344	4,356,799	3,987,247	3,692,561	3,450,762	3,247,914	2,856,809	2,672,480	2,354,277	2,180,280	1,726,870	1,463,592	1,287,350	1,019,634	864,180	684,466	580,112

Peoples

Service Line Installation Standards

Atmospheric Pressure	14.7 psia
Gas Specific Gravity	0.8
Gas Viscosity	7.39E-06 lb/ft sec

Inlet Pressure 80 psig
Pressure Drop 8 psi

STEEL PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

Nominal Diameter (Inches)	Inside Diameter (Inches)	Length of Pipe, (feet)																						
		10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000	2,500	3,000
1/2	0.622	16,808	11,283	8,936	7,574	6,662	5,999	5,490	5,084	4,751	4,472	3,934	3,542	3,242	3,002	2,378	2,015	1,773	1,404	1,190	942	799	703	633
3/4	0.824	36,169	24,279	19,230	16,298	14,336	12,909	11,814	10,941	10,224	9,623	8,465	7,622	6,976	6,460	5,117	4,337	3,814	3,021	2,561	2,028	1,719	1,512	1,361
1	1.049	69,630	46,876	37,128	31,467	27,678	24,923	22,809	21,124	19,740	18,580	16,343	14,716	13,468	12,472	9,879	8,373	7,364	5,833	4,944	3,916	3,319	2,919	2,628
1 1/4	1.380	147,435	98,971	78,389	66,438	58,438	52,621	48,158	44,599	41,678	39,228	34,505	31,070	28,435	26,333	20,857	17,677	15,549	12,315	10,438	8,267	7,007	6,163	5,550
1 1/2	1.610	224,404	150,839	119,312	101,122	88,945	80,093	73,299	67,882	63,437	59,708	52,518	47,291	43,280	40,081	31,748	26,908	23,668	18,744	15,887	12,583	10,884	9,380	8,447
2	2.067	443,335	297,605	235,715	199,778	175,721	158,232	144,811	134,108	125,326	117,959	103,755	93,429	85,504	79,184	62,717	53,155	46,755	37,032	31,386	24,859	21,069	18,532	16,887

PLASTIC PIPE - Cubic Feet of Gas per Hour, Maximum Capacities

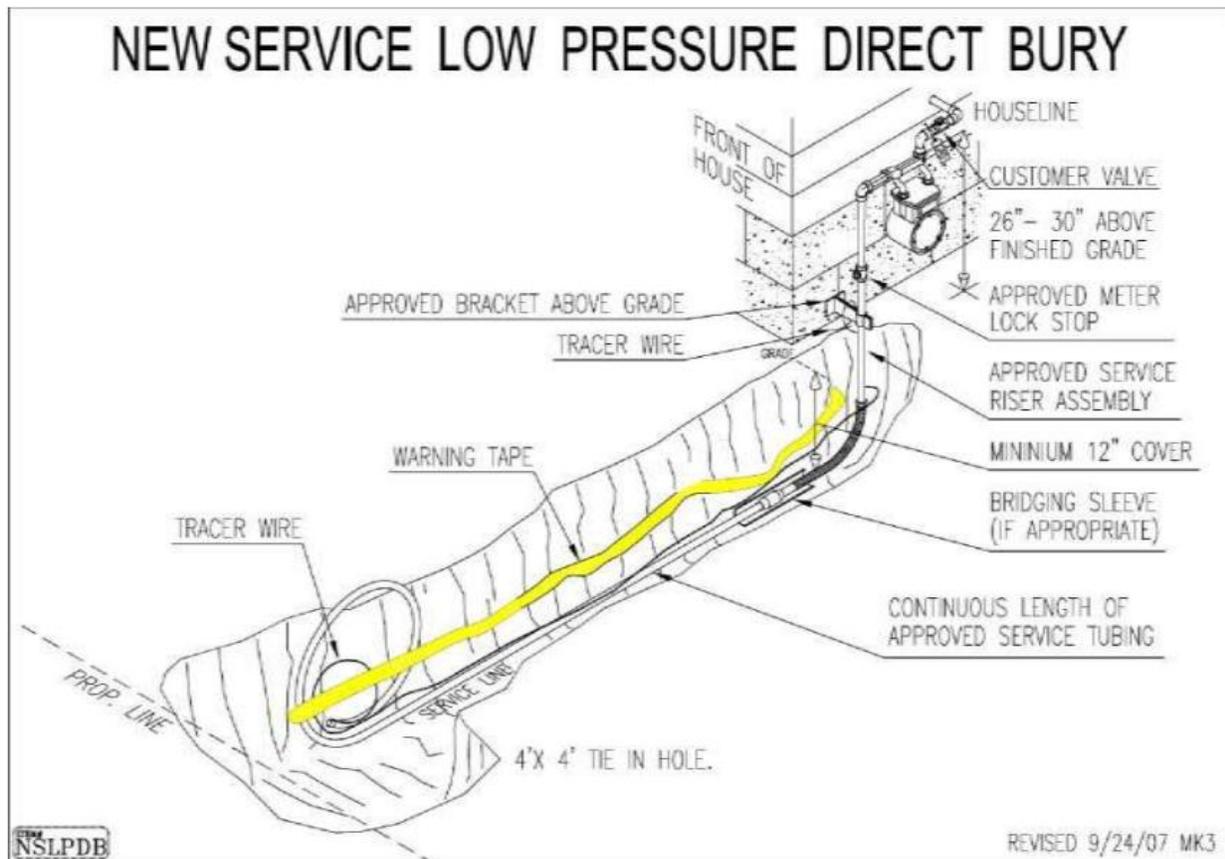
CTS Size (Inches)	Nominal Size (Inches)	Nominal OD (Inches)	Inside Diameter (Inches)	Length of Pipe, (feet)																				
				10	20	30	40	50	60	70	80	90	100	125	150	175	200	300	400	500	750	1,000	1,500	2,000
.062 wall	CTS Tubing	PE 3406																						
3/8	3/8	0.375	0.251	1,418	952	754	639	562	506	463	429	401	377	332	299	273	253	201	170	149	118	100	79	67
.090 wall	CTS Tubing	PE 3406																						
1/2	5/8	0.625	0.445	6,749	4,530	3,588	3,041	2,675	2,409	2,204	2,041	1,908	1,796	1,579	1,422	1,302	1,205	955	809	712	564	478	378	321
.099 wall	CTS Tubing	PE 2406																						
1	1 1/8	1.125	0.927	49,856	33,468	26,508	22,467	19,781	17,794	16,285	15,082	14,094	13,265	11,668	10,507	9,616	8,905	7,053	5,978	5,258	4,164	3,530	2,796	2,369
.121 wall	CTS Tubing	PE 3406																						
1 1/4	1 3/8	1.375	1.133	86,140	57,825	45,800	38,817	34,143	30,745	28,137	26,057	24,351	22,920	20,160	18,153	16,613	15,386	12,186	10,328	9,084	7,195	6,098	4,830	4,094
SDR 11	IPS Pipe PE	3406/2406																						
2	2 3/8	2.375	1.943	374,557	251,435	199,147	168,785	148,460	133,684	122,345	113,303	105,884	99,659	87,659	78,934	72,239	66,900	52,987	44,909	39,501	31,287	26,517	21,002	17,800
SDR 11	IPS Pipe PE	3406																						
3	3 1/2	3.500	2.864	1,078,154	723,750	573,240	485,844	427,340	384,808	352,168	326,140	304,784	286,867	252,323	227,211	207,938	192,570	152,523	129,270	113,703	90,058	76,327	60,454	51,238
4	4 1/2	4.500	3.682	2,138,000	1,435,210	1,136,745	963,437	847,423	763,081	698,355	646,742	604,391	568,883	500,362	450,563	412,345	381,870	302,457	258,344	225,478	178,588	151,359	119,882	101,605
6	6 5/8	6.625	5.421	6,134,735	4,118,183	3,261,753	2,784,467	2,431,577	2,189,570	2,003,847	1,855,748	1,734,229	1,632,284	1,435,729	1,292,836	1,183,175	1,095,730	867,863	735,549	646,978	512,431	434,306	343,988	291,544
8	8 5/8	8.625	7.057	12,586,914	8,449,422	6,692,287	5,671,981	4,988,977	4,492,440	4,111,383	3,807,523	3,558,196	3,349,032	2,945,751	2,652,570	2,427,574	2,248,159	1,780,634	1,509,158	1,327,430	1,051,378	891,085	705,778	598,173
SDR 11.5	IPS Pipe PE	2406																						
3	3 1/2	3.500	2.886	1,100,872	739,000	585,318	496,081	436,344	392,916	359,588	333,012	311,206	292,912	257,640	231,998	212,320	196,628	155,737	131,993	116,099	91,955	77,936	61,728	52,317
SDR 13.5	IPS Pipe PE	2406																						
4	4 1/2	4.500	3.834	2,387,160	1,602,467	1,269,219	1,075,714	946,180	852,010	779,740	722,112	674,826	635,158	558,674	503,071	460,399	426,373	337,704	286,218	251,752	199,398	168,998	133,853	113,448
6	6 5/8	6.625	5.643	6,843,753	4,594,117	3,638,728	3,083,968	2,712,605	2,442,628	2,235,440	2,070,225	1,934,661	1,820,935	1,601,663	1,442,284	1,319,920	1,222,368	968,166	820,559	721,750	571,655	484,501	383,744	325,239
8	8 5/8	8.625	7.347	14,046,862	9,429,465	7,468,521	6,329,870	5,567,845	5,013,515	4,588,259	4,249,185	3,970,908	3,737,484	3,287,428	2,980,239	2,709,148	2,508,921	1,987,168	1,684,204	1,481,397	1,173,327	994,442	787,638	667,555

Peoples

Service Line Installation Standards

Appendix 2.

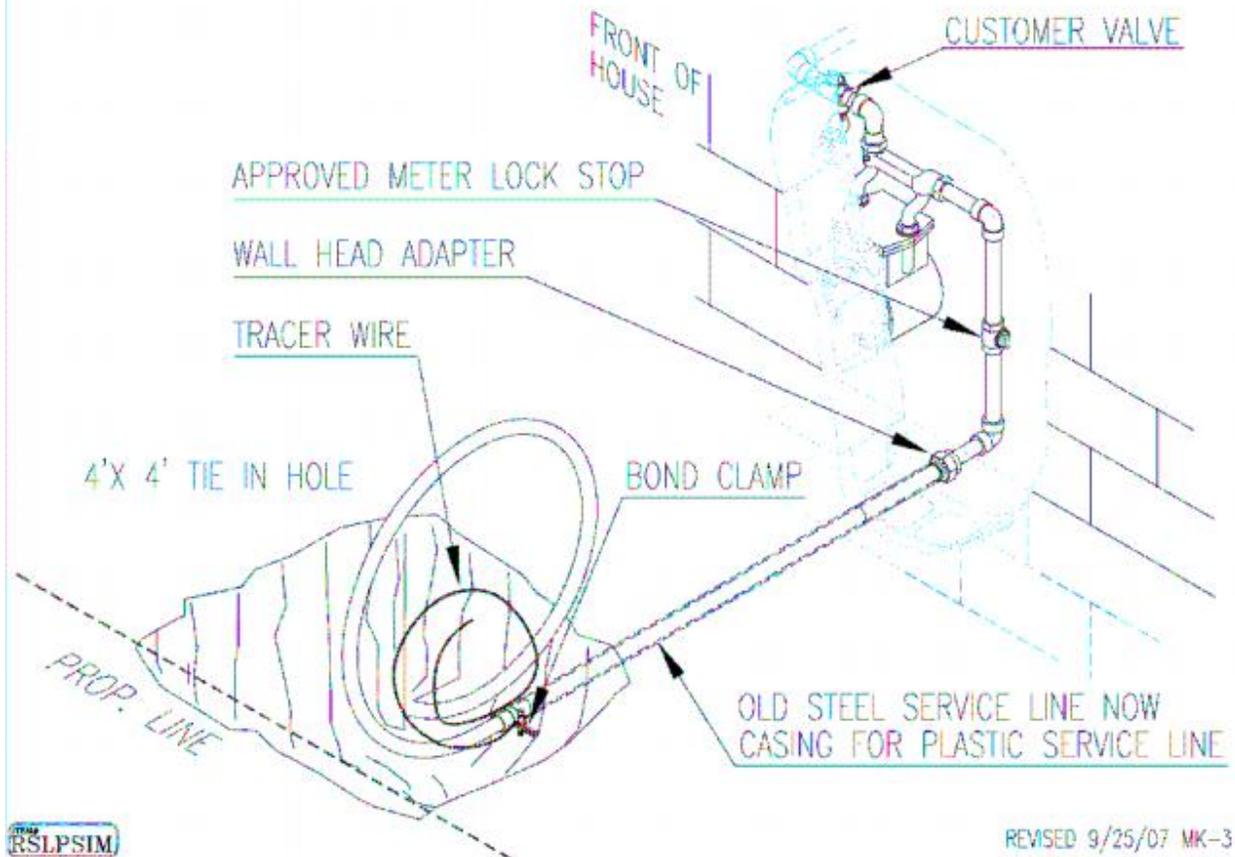
Application Specific Installation Diagrams



Peoples Requirements:

1. Use only Peoples-approved materials.
2. Install continuous lengths of service line tubing, tracer wire, and warning tape. Leave coiled with a length at least 7 feet past property line.
3. Leave a 4 foot by 4 foot excavation, of sufficient depth, to allow for tie in connection.
4. Ensure that riser, manifold, and exposed houseline are adequately coated to prevent atmospheric corrosion. (Paint and/or Wax wrap)
5. Properly install bracket to ensure adequate support for meter.
6. a.) For PNG and PTWP customers: Apply pressure test to installed service and leave for Peoples' inspection.
b.) For Peoples Equitable customers: The Customer's service line must be installed, visually inspected and tested by an Operator Qualified plumber/installer, before gas service is established to a new customer or to a customer whose service has been discontinued for repair, renewal, modification or extension of Customer's service line. The owner or his representative must make known in writing to the Company's inspector at the time of inspection, any hidden, known or suspected defects in violation of or in conflict with the Company's specifications for the piping or Customer's service line trench. Application to the Company for inspection and witnessing of test must be made by the owner of the premises, or his authorized agent, through the Company's appropriate office. The applicant must specify the time and place where the inspection is desired, and notification must be made sufficiently in advance to permit scheduling by the Company.

REPLACED SERVICE LOW PRESSURE SLEEVED INSIDE METER



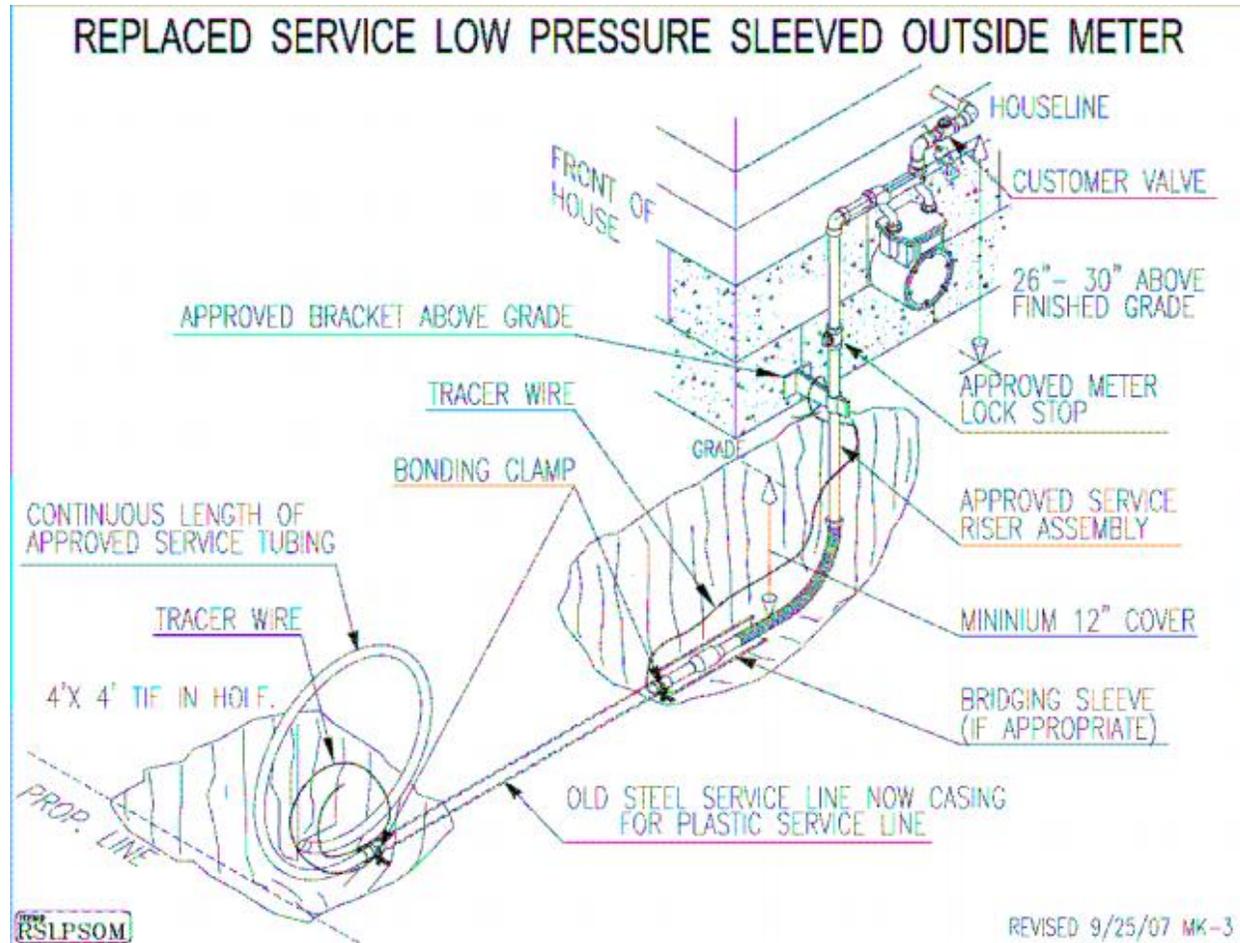
Peoples Requirements:

1. Use only Peoples-approved materials.
2. Install continuous lengths of service line tubing. Leave coiled with a length at least 7 feet past property line.
3. Leave a 4 foot by 4 foot excavation, of sufficient depth, to allow for tie in connection.
4. Ensure that interior service line, upstream of the meter, is adequately coated to prevent atmospheric corrosion. (Paint and/or Wax wrap)
5. Ensure adequate support for meter.
6. a.) For PNG and PTWP customers: Apply pressure test to installed service and leave for Peoples' inspection.
b.) For Peoples Equitable customers: The Customer's service line must be installed, visually inspected and tested by an Operator Qualified plumber/installer, before gas service is established to a new customer or to a customer whose service has been discontinued for repair, renewal, modification or extension of Customer's service line. The owner or his representative must make known in writing to the Company's inspector at the time of inspection, any hidden, known or suspected defects in violation of or in conflict with the Company's specifications for the piping or Customer's service line trench. Application to the

Peoples

Service Line Installation Standards

Company for inspection and witnessing of test must be made by the owner of the premises, or his authorized agent, through the Company's appropriate office. The applicant must specify the time and place where the inspection is desired, and notification must be made sufficiently in advance to permit scheduling by the Company.



Peoples Requirements:

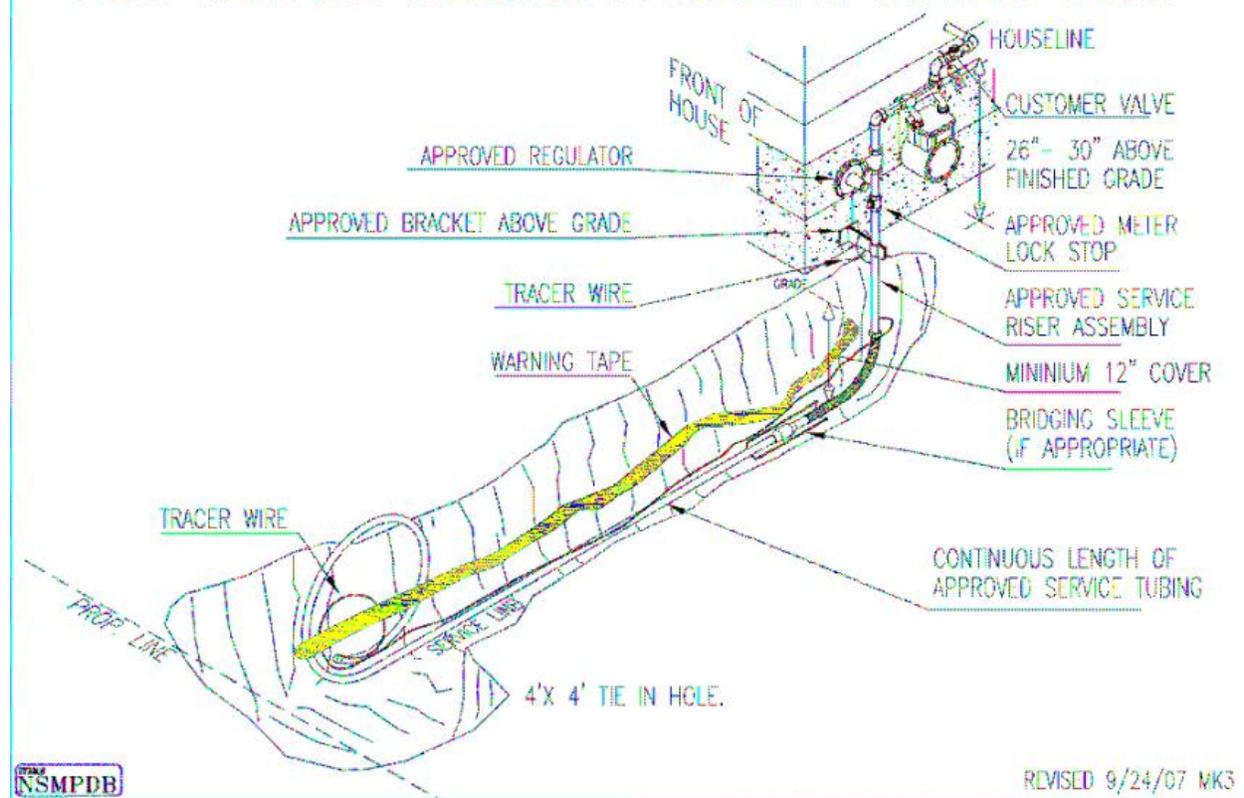
1. Use only Peoples-approved materials.
2. Install continuous length of service line tubing. Leave coiled with a length at least 7 feet past property line.
3. Leave a 4 foot by 4 foot excavation, of sufficient depth, to allow for tie in connection.
4. Ensure that riser, manifold, and exposed houseline are adequately coated to prevent atmospheric corrosion. (Paint and/or Wax wrap)
5. Properly install bracket to ensure adequate support for meter.
6. Apply pressure test to installed service and leave for Peoples' inspection.
7. a.) For PNG and PTWP customers: Apply pressure test to installed service and leave for Peoples' inspection.
- b.) For Peoples Equitable customers: The Customer's service line must be installed, visually inspected and tested by an Operator Qualified plumber/installer, before gas service is established to a new customer or to a customer whose service has been discontinued for repair, renewal, modification or extension of Customer's service line. The owner or his representative must make known in writing to the Company's inspector at the time of inspection, any hidden, known or suspected defects in violation of or in conflict with the Company's specifications for the piping or Customer's service line trench. Application to the

Peoples

Service Line Installation Standards

Company for inspection and witnessing of test must be made by the owner of the premises, or his authorized agent, through the Company's appropriate office. The applicant must specify the time and place where the inspection is desired, and notification must be made sufficiently in advance to permit scheduling by the Company.

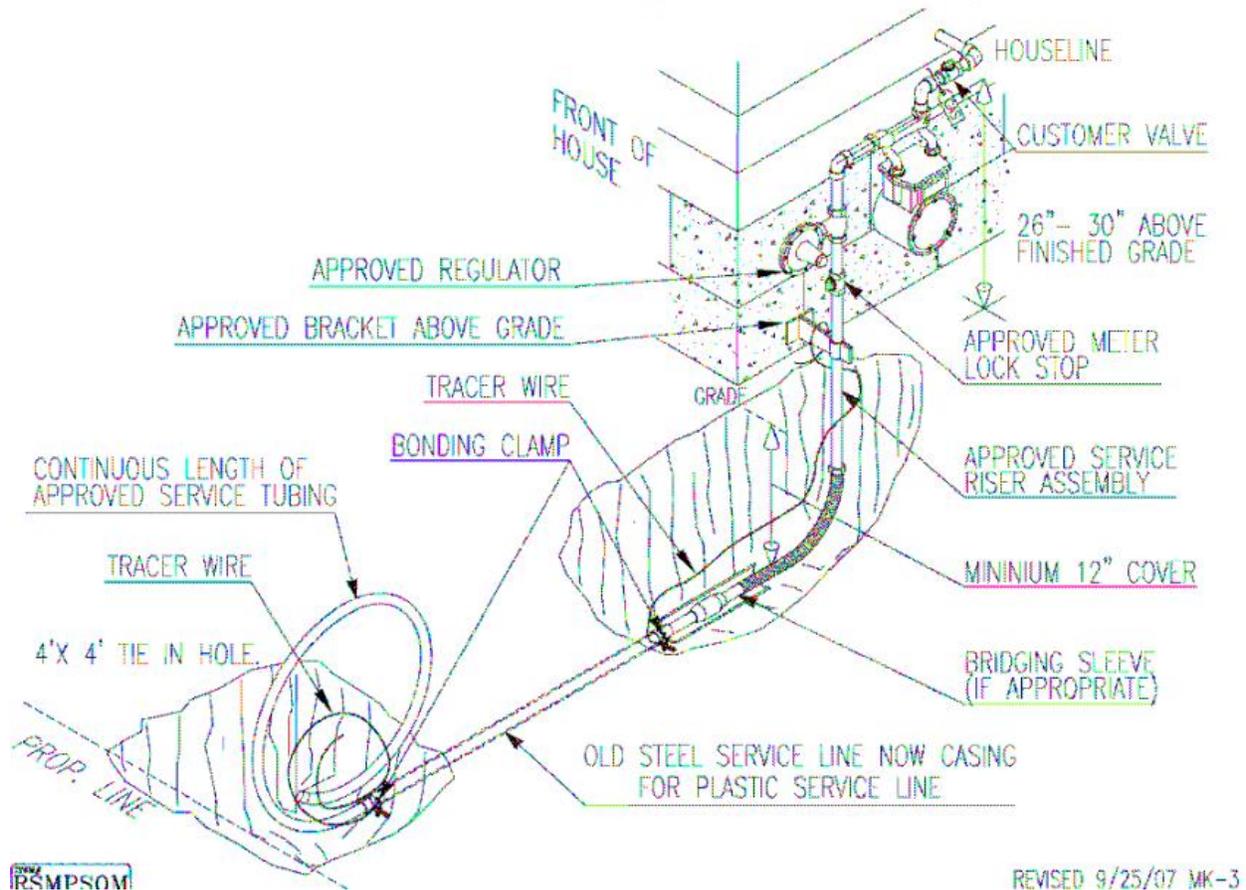
NEW SERVICE MEDIUM PRESSURE DIRECT BURY



Peoples Requirements:

1. Use only Peoples-approved materials.
2. Install continuous lengths of service line tubing, tracer wire, and warning tape. Leave coiled with a length at least 7 feet past property line.
3. Leave a 4 foot by 4 foot excavation, of sufficient depth, to allow for tie in connection.
4. Ensure that riser, manifold, and exposed houseline are adequately coated to prevent atmospheric corrosion. (Paint and/or Wax wrap)
5. Properly install bracket to ensure adequate support for meter.
6. Ensure that regulator relief is pointed downward, unobstructed, and discharges away from building openings and potential ignition sources (may be hard piped away from riser).
7. a.) For PNG and PTWP customers: Apply pressure test to installed service and leave for Peoples' inspection.
- b.) For Peoples Equitable customers: The Customer's service line must be installed, visually inspected and tested by an Operator Qualified plumber/installer, before gas service is established to a new customer or to a customer whose service has been discontinued for repair, renewal, modification or extension of Customer's service line. The owner or his representative must make known in writing to the Company's inspector at the time of inspection, any hidden, known or suspected defects in violation of or in conflict with the Company's specifications for the piping or Customer's service line trench. Application to the Company for inspection and witnessing of test must be made by the owner of the premises, or his authorized agent, through the Company's appropriate office. The applicant must specify the time and place where the inspection is desired, and notification must be made sufficiently in advance to permit scheduling by the Company.

REPLACED SERVICE MEDIUM PRESSURE SLEEVED OUTSIDE METER



Peoples Requirements:

1. Use only Peoples-approved materials.
2. Install continuous length of service line tubing. Leave coiled with a length at least 7 feet past property line.
3. Leave a 4 foot by 4 foot excavation, of sufficient depth, to allow for tie in connection.
4. Ensure that riser, manifold, and exposed houseline are adequately coated to prevent atmospheric corrosion. (Paint and/or Wax wrap)
5. Properly install bracket to ensure adequate support for meter.
6. Ensure that regulator relief is pointed downward, unobstructed, and discharges away from building openings and potential ignition sources (may be hard piped away from riser).
7. SLI to install bonding clamp on existing casing and extend tracer wire up service line riser.
8. a.) For PNG and PTWP customers: Apply pressure test to installed service and leave for Peoples' inspection.
b.) For Peoples Equitable customers: The Customer's service line must be installed, visually inspected and tested by an Operator Qualified plumber/installer, before gas service is established to a new customer or to a customer whose service has been discontinued for repair, renewal, modification or extension of Customer's service line. The owner or his representative must make known in writing to the Company's inspector at the time of

Peoples

Service Line Installation Standards

inspection, any hidden, known or suspected defects in violation of or in conflict with the Company's specifications for the piping or Customer's service line trench. Application to the Company for inspection and witnessing of test must be made by the owner of the premises, or his authorized agent, through the Company's appropriate office. The applicant must specify the time and place where the inspection is desired, and notification must be made sufficiently in advance to permit scheduling by the Company.

Peoples

Service Line Installation Standards

Appendix 3.

Peoples Natural Gas & Peoples TWP Service Installation Record



Service Installation Record

Instructions: Complete this form and fax it to 1-888-846-3259. If gas is required for the first time for this location, please call 1-888-280-2938 between 8:00 am and 5:30 pm Monday - Friday to determine if gas is available. **Forms not legibly completed in their entirety will be rejected.**

PNG USE ONLY			
Date Received	Project Number	Investment No	Tap No

NOTE: For NEW service line installations, this form will not be accepted until AFTER an application has been submitted by the responsible party and received and approved by Peoples Natural Gas.

Development/Project Name (Type or Print)		Date Service Line Installed	
Customer Name		Contact Name & Phone Number for Tie In	
Street Address			Lot Number
City	State	Zip	Municipality
Building Type <input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Mobile Home		Installation Type <input type="checkbox"/> New <input type="checkbox"/> Renewed <input type="checkbox"/> Repaired <input type="checkbox"/> Misc**	
** Misc Activity <input type="checkbox"/> Manifold Repair Only		<input type="checkbox"/> Manifold Painted <input type="checkbox"/> Other	
Riser Manufacturer: <input type="checkbox"/> Elster/Perfection Factory Fit <input type="checkbox"/> Elster/Perfection Field Fit <input type="checkbox"/> Continental Factory Fit <input type="checkbox"/> Energy Control Systems Factory Fit		Riser Connection Type: <input type="checkbox"/> Perfection Stab Style <input type="checkbox"/> Butt Fusion <input type="checkbox"/> Continental Stab Style	
Riser Size			
Customer Service Line (Curb to Meter)- Check All That Apply			
Material <input type="checkbox"/> Plastic (if plastic, check from permissible list below) <input type="checkbox"/> Steel		Minimum Test Pressure Indicate the type of test performed by checking the appropriate box:	
<input type="checkbox"/> Performance Pipe Driscoplex- All standards <input type="checkbox"/> US Poly Company (Uponor)- All Standards <input type="checkbox"/> Duraline Polypipe- All Standards <input type="checkbox"/> Charter Plastics- 1" CTS only <input type="checkbox"/> Oil Creek Plastics- 1 1/4" CTS & below		<input type="checkbox"/> 90 psig for 10 mins <input type="checkbox"/> 150 psig for 10 mins <input type="checkbox"/> 90 psig for 1 hour *** <input type="checkbox"/> 150 psig for 1 hour*** *** required for pipe diameter 2" and larger	
Plastic Manufacturer Lot/Serial # ASTM D2513 _____		<input type="checkbox"/> Low Pressure System (Ounces) <input type="checkbox"/> Regulated Pressure System	
<input type="checkbox"/> Direct Burial- Tracer Wire (Y / N) <input type="checkbox"/> Insert		Service Depth Service Length	
Installing Firm			
Firm Name			
Address		City	State Zip
Contact Name (Type or Print)		Phone Number	
Note: By signing this form, the installer attests that they installed or repaired and tested the service line and/or meter in accordance with applicable codes and standards including, but not limited to:			
INSTALLATION			
1. Material used in this installation meet Peoples Natural Gas' approved standards		8. Meter manifold is protected from vehicular damage	
2. A tracer wire that is of 12 gauge solid copper wire with a yellow thermoplastic coating was installed (All services)		9. Meter manifold is not closer than 3 feet from an ignition source	
3. Tracer wire was properly installed and checked for continuity across its entire length		10. Meter manifold service line is properly supported.	
4. Service line is installed at a minimum depth of 12 inches or encased		11. Meter is accessible and as perpendicular to the main as possible	
5. New service is not run under steps, porches or crawl spaces		12. New meter manifold valve installed	
6. Meter manifold installed does not block a fire escape		13. Service must be run to the street to which the structure is addressed, unless given permission by Peoples Natural Gas	
7. Meter manifold is properly supported		14. All exposed piping must be suitably coated to prevent corrosion	
INSTALLER			
1. He/She is Operator Qualified in accordance with the requirement set forth in 49 CFR 192, Subpart N. This means that the installer has been evaluated by a Peoples Natural Gas approved third party qualifier and has been deemed qualified to perform the various covered tasks associated with installation of natural gas service lines. (3 year re-qualification required)			
2. He/She has been evaluated and qualified by a Peoples Natural Gas approved third party qualifier to join plastic pipe utilizing mechanical couplings. (1 year re-qualification required)			
3. His/Her employer administers a Drug & Alcohol Testing Program that meets the requirements of 49 CFR 199, including random testing.			
The installer understands and agrees that by performing the inspection herein and accepting this form and stated qualifications of the installer, Peoples Natural Gas is not assuming nor accepting any responsibility or liability for the installation or repair work performed by the installer and that the installer remains solely responsible for any work performed. Further, installer agrees to indemnify, hold harmless, and, if requested, defend Peoples Natural Gas, its officers, employees and agents from and against any and all liabilities, costs, claims, demands, fines, penalties, suits (including cost of defense), proceedings, actions, and causes of action, including reasonable attorney's fees arising out of, or associated with, or related to the installation described herein.			
Visit http://www.peoples-gas.com/InformationforContractorsPlumbers.aspx for additional forms			
Installed and Tested by (Must be Legible)		Signature	
Qualified By (Name of Qualifying Agency)		Date	
		OQ ID Number	

Peoples

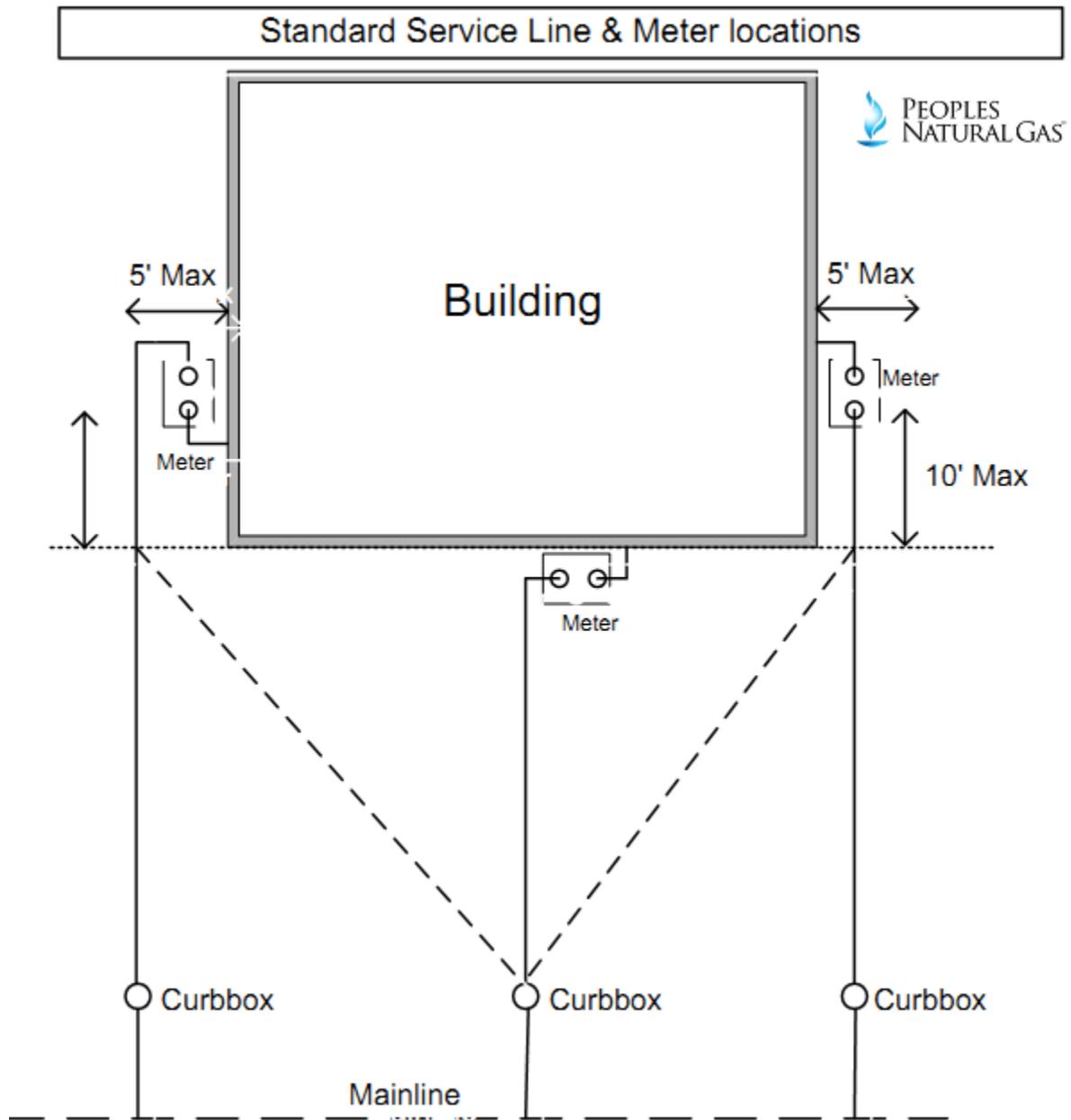
Service Line Installation Standards

Appendix 4.

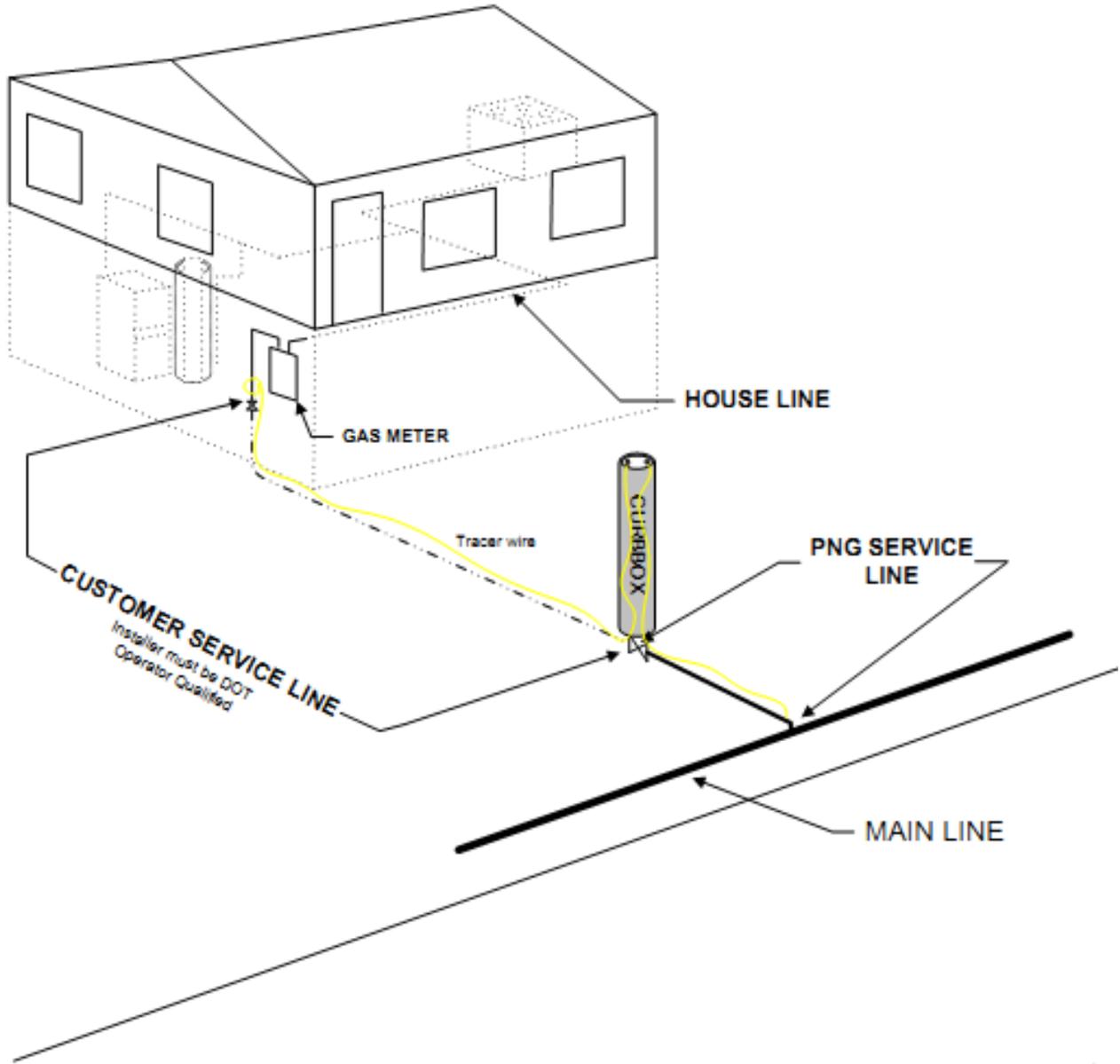
Standard Service Line Spotting Practices

- **Building Lots with Existing Gas Taps:** The installer shall communicate with the Peoples Natural Gas Engineering Department prior to service line installation to verify the existence of a pre-installed gas tap. If a tap already exists at the new construction site, the service line shall be installed in a straight line from the proposed meter location to existing tap.
- **Service Lines spotted on the front wall:** The Service Line must be perpendicular to the road from the front wall.
- **Service Lines spotted on the sidewall:** The Service Line riser must not be more than 10 feet from the front corner of the building. The Service Line must go out and parallel the foundation a distance of 3 to 5 feet off the sidewall, and then extend in a direction perpendicular to the road.
- **Meters considered to be at risk of vehicular damage:** Customer must provide bollards or barriers to protect the meter when in close proximity of vehicle traffic (parking lots, driveways, etc.)
- **Service Lines spotted Remote:** A gas meter must be located within 100 feet of the front property line of the house to be served (or the property line closest to the main line to be tapped). When the house is in excess of 100 feet of the property line, a Company representative shall be consulted prior to determine the remote location of the meter. Consideration to potential vehicular damage will be given when determining meter location.
- **Service Lines with an MAOP in excess of 60 psig:** A service line with a Maximum Allowable Operating Pressure (MAOP) in excess of 60 psig shall have a meter located in the immediate area of the mainline to allow adequate space for required regulation devices. Installers should consult with a Company representative to determine the meter location when this condition exists.
- **Buried House Lines Downstream of a Remote Meter:** The maximum combined length of the service line (main to meter) and the buried house line (meter to building) shall not exceed 1000 feet without approval by Peoples management.

Standard Service Spotting

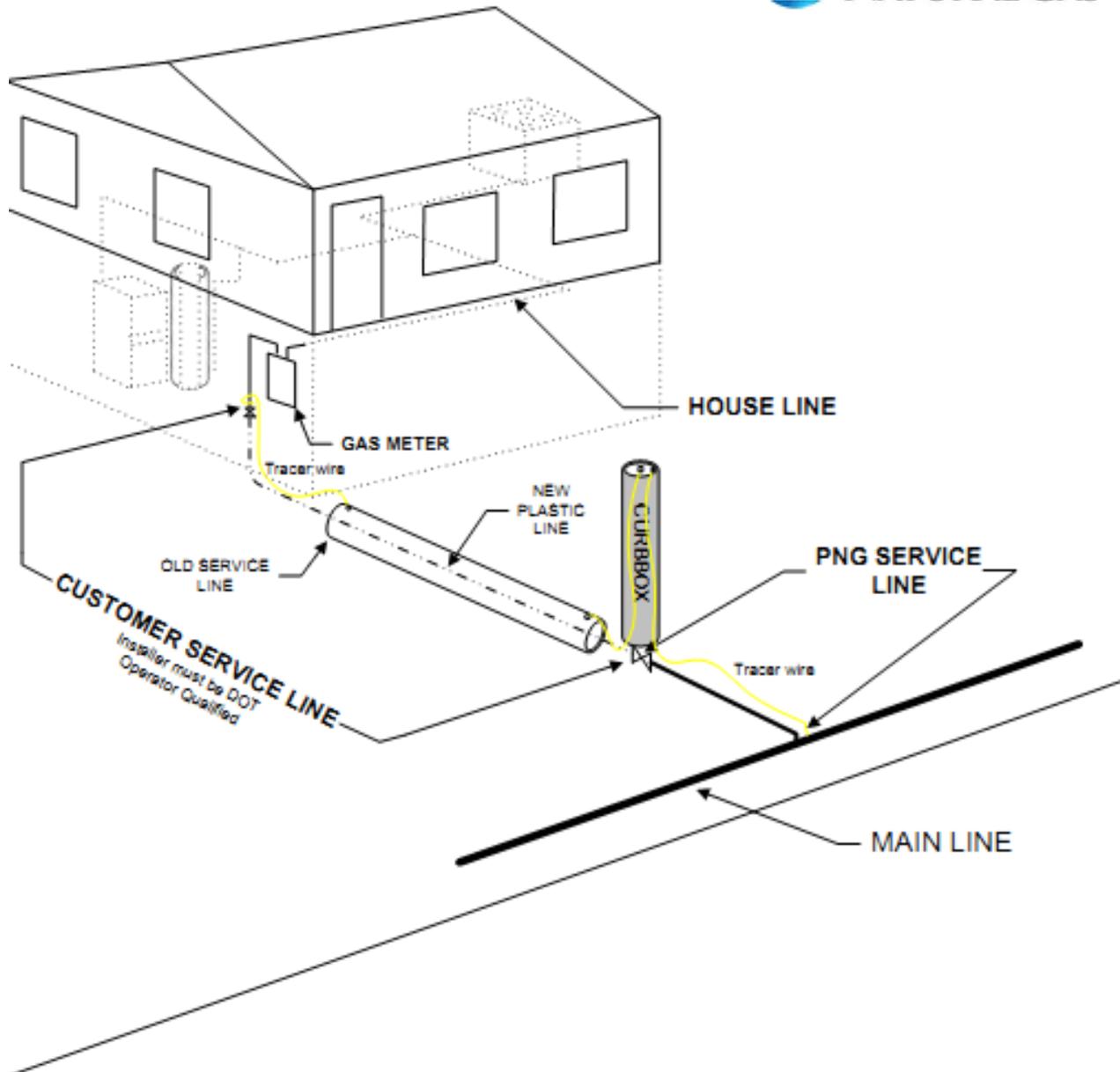


Direct Burial Service Line



Tracer wire: 12 Gauge solid copper,
Yellow thermoplastic insulation only.
Tracer wire continuity will be verified
before service is connected

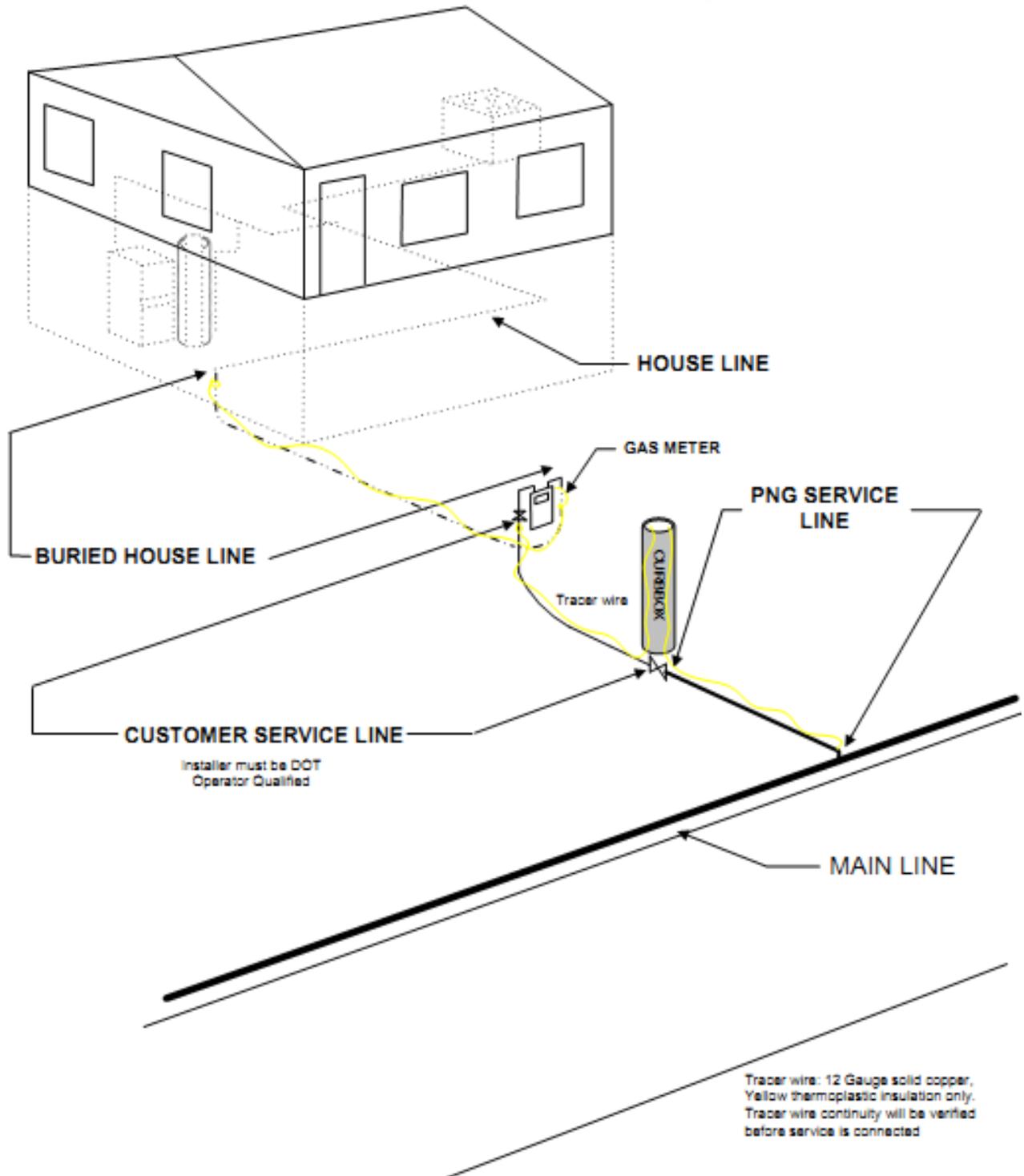
Service Renewal (Insert)



**SERVICE LINE RENEWAL
(WITH METER OUTSIDE)**

Tracer wire: 12 Gauge solid copper,
Yellow thermoplastic insulation only.
Tracer wire continuity will be verified
before service is connected

Highway Meter Set



Tracer wire: 12 Gauge solid copper,
Yellow thermoplastic insulation only.
Tracer wire continuity will be verified
before service is connected

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Service Line Installation Standards

Appendix 5.

Meter Installation Measurements

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Service Line Installation Standards

Appendix 6 Welding Guidelines

APPENDIX 6

PEOPLES' WELDER CERTIFICATION

All welded natural gas line installations must meet the requirements of the Code of Federal Regulations; Title 49, Part 192- "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards". To so comply, any welding performed as a part of such installation must be performed only by welders that are Operator Qualified in the manner set forth in Section 192.227 and subject to the limitations set forth in Section 192.229 of the above.

APPENDIX C TO PART 192—QUALIFICATION OF WELDERS FOR LOW STRESS LEVEL PIPE

I. Basic test. The test is made on pipe 12 inches (305 millimeters) or less in diameter. The test weld must be made with the pipe in a horizontal fixed position so that the test weld includes at least one section of overhead position welding. The beveling, root opening, and other details must conform to the specifications of the procedure under which the welder is being qualified. Upon completion, the test weld is cut into four coupons and subjected to a root bend test. If, as a result of this test, two or more of the four coupons develop a crack in the weld material, or between the weld material and base metal, that is more than 1/8 -inch (3.2 millimeters) long in any direction, the weld is unacceptable. Cracks that occur on the corner of the specimen during testing are not considered. A welder who successfully passes a butt-weld qualification test under this section shall be qualified to weld on all pipe diameters less than or equal to 12 inches.

If any portion of the Customer's Natural Gas Line has been joined by the welding process, the customer or installer must indicate on the Request for Service Form that the welder has been certified and Operator Qualified, prior to welding, according to the requirements set forth in this Appendix.

Prior notification is to be given before performing any kind of welding procedure on the Customer's Natural Gas Line of the work to be performed and to acknowledge the person performing the work has the proper qualifications.

All welders, welding gas lines up to 60 PSIG M.A.O.P. must be certified once per calendar year not to exceed 15 months.

However, a welder may not weld on pipe to be operated at a pressure that produces a hoop stress of 20 percent or more of SMYS unless within the preceding 6 calendar months the welder has had one weld tested and found acceptable under the sections 6 or 9 of API Standard 1104 (incorporated by reference, see §192.7). Alternatively, welders may maintain an ongoing qualification status by performing welds tested and found acceptable under the above acceptance criteria at least twice each calendar year, but at intervals not exceeding 7 1/2 months. A welder qualified under an earlier edition of a standard listed in §192.7 of this part may weld but may not re-qualify under that earlier edition.

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Service Line Installation Standards

Peoples Gas will honor all recent and up to date welding certifications that are in compliance with CFR Title 49, Part 192 Appendix C—Qualification of Welders for Low Stress Level Pipe such certification must include the following:

1. Welder's Name
2. Social Security Number
3. Testing Agency
4. Date Tested
5. Test Witness
6. Welding Process (SMAW, LH, GMAW)
7. Test Method

The welder's card or certification must show that he is qualified to weld pipe and what welding procedure he is qualified to use. These tests would be recorded on his card or certificate.

(A) The welder's card/certificate must state that he has qualified in welding steel pipe not plate.

(B) The welder's card/certificate must show what welding procedure he is qualified to use. These tests must be recorded on his card.

A card/certificate will be honored if the test given meets the requirements specified.