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SPECIFICATION: **G-8100-16a**

TITLE: **GENERAL SPECIFICATION FOR THE INSTALLATION OF GAS DISTRIBUTION SERVICES**

VOLUME: **2 (Section 12.0), 10 and Yellow Book**

COURSE ID: **GAS0119**

CORE GROUP: **Gas Construction**

TARGET AUDIENCE: **Gas Construction, Emergency Response Force (ERF), Gas Development Lab, Construction, Per Diem, and Gas Contractors**

REV 16a (1/20/2020)
Section 4.1: Revised section to clarify intent that applicability is limited to Gas Operations company employees.
Section 11.6: Restored 1st sentence of 2nd paragraph, which was inadvertently deleted.

REVISIONS: (See ★)

1)	Section 3.19	-	New definition.
2)	Section 4.1	-	New section. Renumbered subsequent sections.
3)	Section 4.2	-	Reworded for clarity.
4)	Section 5.4	-	Added reference to Bulletin.
5)	Section 5.11	-	Changed minimum clearance from 4” to 6”.
6)	Section 5.11 (D)	-	Changed minimum clearance from 4” to 6”.
7)	Section 5.11 (E)	-	Changed minimum clearance from 4” to 6”.
8)	Section 5.30	-	Removed Class/Stock number for ASG Kit.
9)	Section 5.43	-	New section. Renumbered subsequent sections.

10	Section 5.47	-	Added IP-46
11)	Section 6.14	-	Section rewritten in its entirety.
12)	Section 7.2 (D)	-	Reworded for clarity.
13)	Section 8.3	-	Added reference to spec G-8205.
14)	Section 9.6	-	Updated chart with smaller diameters.
15)	Section 9.8	-	Removed Class/Stock number for ASG Kits.
16)	Section 9.10	-	New section. Renumbered subsequent sections.
17)	Section 9.16	-	Added verbiage on appearance of molded fittings.
18)	Section 10.5	-	New section.
19)	Section 11.15 (I)	-	Added requirement for MetFit couplings.
20)	Section 14.0	-	Added IP-46

Gas Operations Standards

TITLE: GENERAL SPECIFICATION FOR THE INSTALLATION OF GAS DISTRIBUTION SERVICES

TABLE OF CONTENTS

1.0 SCOPE

This specification details the construction requirements for the installation of new and replacement gas services designed to operate at pressures less than 125 psig.

2.0 LEGAL REQUIREMENTS

Federal: 49 CFR Part 192, Sections 123, 125, 143, 151, 159, 273, 279, 301-327, 351-383, 451-475, 479, 627, 751

State: 16 NYCRR Part 255, Sections 123, 125, 143, 151, 159, 273, 279, 301-327, 351-383, 451-475, 479, 627, 751

New York City: NYC Fuel Gas Code

3.0 DEFINITIONS

3.1 **Asbestos Containing Material (ACM)** – Asbestos or any material containing more than one percent asbestos.

3.2 **Autoseal** – a material that was used to seal cast iron main joints. This material may contain PCBs, benzene, and cresol.

3.3 **Distribution Piping** – all piping, tubing, and fittings that transport the gas to the customer's equipment/appliances *from*:

- for inside meter(s) - the meter outlet
- for outside meter(s) – outside the building wall.

3.4 **Epi-Seal** – a material that was used in the past to line gas services. This material may be ACM.

3.5 **Hazardous Material** – a material containing oil, sludge, benzene, PCBs,etc.

3.6 **Hole** – an opening in the main that is drilled only (not threaded).

3.0 **DEFINITIONS** (Continued)

3.7 **Maximum Allowable Operating Pressure (MAOP)** - the maximum pressure at which a main/service may be operated.

3.8 **Meter Piping** - If the meter(s) is/are in the building, then the meter piping is the piping from the first fitting inside the building to the outlet side of the meter(s). Meter piping does not apply to locations with outside meter(s).

3.9 **Multi-residential** – a building that contains 4 or more dwelling units.

3.10 **Operator Qualified** - An individual who has been evaluated and can perform assigned covered tasks and can recognize and react to abnormal operating conditions.

3.11 **Point of Entry (POE)** – the point of entry for the gas service into a building.

3.12 **Pressure**

Low	-	Pressure up to and including 12” WC.
Intermediate Ossining System	-	Pressure greater than 1 psig and up to and including 5 psig.
Medium	-	Pressure greater than 2 psig and up to and including 15 psig.
High	-	Pressure greater than 15 psig and up to but less than 125 psig.

See Gas Specification G-8051, “Gas System Design Criteria”

3.13 **Residential** – a building that contains 1-3 dwelling units.

3.14 **Standard Dimension Ratio (SDR)** – the ratio of the pipe outside diameter to the pipe minimum wall thickness for Polyethylene (PE) plastic pipe.

3.15 **Service Head Valve (SHV)** – service head valve is the valve located at the head of service.

3.0 **DEFINITIONS** (Continued)

3.16 **Service Line/Piping** – all piping, tubing and fittings that transport the gas from the main *to*:

- for inside meter(s) – the outlet of the meter
- for outside meter(s) – outside the building wall

3.17 **Service Regulator** – a mechanical device that reduces gas pressure from main pressure to customer utilization pressure. This may be located on the service or meter piping.

3.18 **Taphole** – an opening in the main that is drilled and threaded.

★ 3.19 **Weak Link** – a device or method used when pulling polyethylene (PE) pipe, typically through methods such as horizontal directional drilling, to ensure that damage will not occur to the pipeline exceeding the maximum tensile stresses allowed.

4.0 **ENVIRONMENT, HEALTH, AND SAFETY (EHS) REQUIREMENTS**

★ 4.1 Prior to starting a task, the Job Safety Analysis (JSA) library shall be reviewed to determine if there is a JSA for this task. Any relevant JSA found in the library shall be used in conjunction with the job briefing. This is applicable to Gas Operations Company employees only.

★ 4.2 Notify the EH&S Control Desk (212-580-8383) immediately if you discover a spill as per GEHSI E02.01 “Spill Reporting”. Contact Gas EH&S for guidance on clean-up.

4.3 11.03 checklist must be completed prior to beginning work on any planned project work, as defined in CEHSP A11.03 “Environment, Health and Safety Considerations in Project Engineering and Planning” that requires engineering design support and are being implemented by employees and/or third party contractors/developers working on present or future Con Edison property or working on Con Edison infrastructure.

4.4 All non-hazardous pipe, tubing, fittings, and/or shavings that cannot be reused, shall be brought back to the workout location for proper disposal/recycling.

4.0 **ENVIRONMENT, HEALTH, AND SAFETY (EHS) REQUIREMENTS** (Continued)

4.5 Materials for capping open ended services shall be on location. Services shall be capped when work is not in progress.

4.6 An appropriate environmental site setup shall be installed:

A) Prior to cutting a properly supported existing service, **AND**

B) Prior to disconnecting the service head piping.

The environmental site setup is dependent on the substances and quantity of material found in the main. At a minimum, the environmental site setup in the excavation and under the service head piping shall include non-skid matting, absorbent pads and catch basin.

The determination of the type of hazardous materials within the main can be made by:

A) Visual inspection of main interior via plugs/tap holes on the main.

B) Review of the M&S plate.

C) Inspection of the existing condition in the excavation or building.

D) Internal inspection of the pipe with a camera.

4.7 The removal of service regulators is covered in GEHSI E06.06, “Mercury-Containing Equipment” and **must only** be completed by trained company and/or Contractor (which includes Per Diem) personnel.

4.8 Prior to a service insertion, abandonment or “relay” replacement (full or partial), the old service pipe shall be checked for hazardous substances.

If any hazardous substances (oil, sludge, etc.), other than drip water, are found in distribution mains, immediately contact EHS Operations.

- **Free flowing liquids (non-oily)** shall be treated as drip water and handled in accordance with GEHSI E06.08, "Gas Drip Water, Drip Pots and Drip Pot Liquids.” Drip water is any accumulation of water from outside sources (i.e., water infiltration due to corrosion, cracks, condensation or water main breaks) found inside gas distribution pipes and is hazardous for benzene.

4.0 **ENVIRONMENT, HEALTH, AND SAFETY (EHS) REQUIREMENTS** (Continued)

- **Solid non-oily sludge and oily sludge** shall be handled in accordance with GEHSI E06.11, "Liquids and Solids during Main Cut-Outs."

- **Autoseal** shall be handled in accordance with Gas Operations EH&S Instruction GAS0025, "Handling Auto Seal in Gas Mains." Autoseal (A.S.) or Never Leak (N.L) were materials sprayed into cast iron mains to seal joints and may be hazardous for PCBs, benzene, and cresol.

4.9 If the existing service (that is to be replaced) is suspected to have been treated with Epi-Seal, perform the necessary steps in GAS0027, "Handling Gas Services Containing Epi-Seal" to confirm if the Epi-Seal contains asbestos.

4.10 For existing steel mains and services coated with coal tar wrap, follow the established environmental procedure in the Asbestos Management Manual (AMM), Chapter 6.04.

4.11 **If** contaminated soil is discovered **off** Con Edison property, follow EH&S GEHSI E5.11 "Excavated Soils on Property Not company owned" and contact your supervisor.

4.12 Prior to excavating/operating a curb valve, check the curb valve box for oily water and, if found, follow the established environmental procedure in GEHSI E02.10, "Valve Test Boxes."

4.13 Check for "Clear Access" to the head of service piping and meter(s) location/room and other immediate areas (e.g. equipment/appliances) needed to be accessed as per Asbestos Management Manual, Chapter 6.02.

4.14 Assume that paint on inside service piping is lead paint with PCBs and handle as per GEHSI E06.04.

4.15 Check for grey duct seal at the head of service piping and handle as per Asbestos Management Manual, Chapter 6.03.

4.16 Treat meter gaskets as asbestos containing material (ACM) as per Asbestos Management Manual, Chapter 6.10.

4.0 **ENVIRONMENT, HEALTH, AND SAFETY (EHS) REQUIREMENTS** (Continued)

4.17 Personnel shall not use personal electronic devices (PEDs) (e.g. cell phones) while performing tasks, or working with someone performing tasks described in this specification, or while in other situations in which they may be distracted and pose a safety risk to oneself or others.

EXCEPTIONS:

- It is acceptable to use Company-issued intrinsically safe radios or cell phones to communicate with the GERC, Gas Control or supervision to request assistance or to report findings.
- It is acceptable to use cell phones or cameras to document existing or new gas main or service installations only after confirming there are no gas readings using a calibrated combustible gas indicator.

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS**

OPERATOR QUALIFICATION

5.1 **Installers who tap an energized pipeline, weld steel, and join PE plastic pipe by butt fusion, branch saddle fusion, electrofusion, or with mechanical fittings must be Operator Qualified**.

All other “covered tasks” shall be completed by either Operator Qualified individuals or individuals under the direct observation of one who is Operator Qualified. “Direct observation” means that the Operator Qualified individual remains in direct visual and verbal contact at all times with the individual performing the task.

5.2 Installers who join PE plastic pipe/ tubing and fittings by butt fusion, branch saddle fusion, electrofusion, or with mechanical fittings must be Operator Qualified **and** in compliance with the annual requalification requirements of Gas Specification G-8121, "Qualification of Installers Joining Polyethylene (PE) Plastic Pipe/Tubing and Fittings for Gas Mains and Services."

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

OPERATOR QUALIFICATION (Continued)

All butt fusion, branch saddle fusion, and electrofusion joints must be fabricated in accordance with the fusion procedures outlined in Gas Specifications G-8123, "Heat Fusion Joining of Polyethylene Plastic Pipe/Tubing and Fittings for Gas Mains and Services" and IP-27, "Installation of Electrofusion Fittings on Plastic Pipe/ Tubing and Molded Fittings Using a Universal Electrofusion Processor."

All mechanical joints must be fabricated in accordance with the installation procedures outlined in Gas Specification IP-20, "Installation of Mechanical Fittings for Plastic Pipe and Tubing."

5.3 Welders shall be Operator Qualified in accordance with the requirements in Gas Specification G-1065, "Qualification of Welders and Welding Procedures".

Welding shall be performed in accordance with Gas Specification G-1064, "Shielded Metal Arc Welding Procedures for Welding Steel Pipe and Fittings."

★ 5.4 Any pre-existing plastic joints exposed during the installation of a service and/or main shall be inspected by an Operator Qualified Individual. See Bulletin.

COVER/PROTECTION

5.5 Where possible, direct burial of new/replacement services and any exposed (unsleeved) portion of an inserted service shall be installed with a minimum cover of 24 inches. For cover less than 24 inches, adequate protection (e.g. protection plates) shall be provided only when subsurface obstruction prevents obtaining 24 inches (See Gas Drawing EO-6799-C, "Protective Covers for Gas Main and Service Installations")

NOTE:	If a minimum of 18 inches of cover cannot be maintained, consult with the Gas Distribution Engineering Department.

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

COVER/PROTECTION (Continued)

5.6 Install "WARNING BURIED GAS LINES BELOW" TAPE (Class/Stock #024-6660) approximately 12" above the top of the direct buried new/replacement service where 24” minimum cover is able to be maintained. In areas where 24” cover is NOT able to be maintained, Warning Tape may be installed closer to the steel protective plate to avoid installing Warning Tape in the road bed. When new/replacement services are inserted, the tape is to be installed in all excavations, such as the curb valve and other excavations.

5.7 Electronic markers (EMs) (for e.g. electronic marker balls, electronic marker tapes, or equivalent) shall be installed as per Gas Drawing 502664, "Installation of Electronic Markers on Gas Mains and Services" and noted on the emergency sketch or signed off layout. EMs shall be installed in addition to warning tape and tracer wire, when required for PE pipe.

5.8 Each new/replacement service line must be properly supported on undisturbed or well-compacted soil. All installations of new/replacement direct buried (or on the exposed portion of inserted services) services shall be backfilled with a minimum of 12” above the top of the service line with sand, 3/8” clean fill or recycled screening backfill. All material used for backfill and pipe support must be free of materials that could damage the pipe or its coating. Install properly compacted suitable backfill on top of the 12” minimum backfill described above. See Gas Drawing 309495, “Trench Excavation for Gas Mains and Services up to 350 psig.

NOTE:	If a service is installed in a "rock area", a 4"- 6" bedding of sand, 3/8” clean fill or recycled screening backfill shall be used.

5.9 Adequate protection devices shall be installed in areas where the service head valve, service regulator (if required), meter(s), and associated valves are subject to vehicular damage. See Gas Drawing 502163, "Bumper Installation.”

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

COVER/PROTECTION (Continued)

5.10 All pipe which is installed in a navigable river, stream, or harbor must have a minimum cover of 48 inches in soil or 24 inches in consolidated rock between the top of the pipe and the underwater natural bottom (as determined by recognized and generally accepted practices). However, less than the minimum cover is permitted if it is installed with additional protection (e.g. protection plates) to withstand anticipated external loads.

Corporate Environmental, Health and Safety Procedures (CEHSPs) must be followed for any project, including both planned and emergency work that could potentially impact the environment. See CEHSP E09.01 "Protection of Natural Resources", GEHSI 13.01 "Wetlands and Protected Open Waters", GEHSI E13.02 "Managing Wildlife" and GEHSI 13.03 "Working Near City Owned Trees and or Within NYC Department of Parks and Recreation (NYCDPR).

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

CLEARANCES (Continued)

★ 5.11 Where possible, the direct burial of new/replacement services shall be installed with the following minimum required clearances between gas facilities and electric facilities, steam facilities, water and sewer facilities, and other facilities (e.g., telephone, cable, petroleum):

Subsurface Facility	Gas Service	Minimum Clearance with Protection
Electric Conduit or structure	6 inches**	2 inches
Electric Underground Residential Distribution System (URD) (direct buried) Cable	12 inches	2 inches
Electric Oil-o-static (Electric Transmission) *	12 inches	6 inches
Steam	6 inches** (metallic gas pipe) 35 feet (PE plastic gas pipe)	2 inches (metallic gas pipe) 35 feet (PE plastic gas pipe)
Water & Sewer	6 inches**	2 inches
Other Facility (e.g., telephone, cable, petroleum)	6 inches**	2 inches

** Where gas mains/services run parallel to electric transmission lines for significant distances contact electric transmission for guidance.*

*** It is recommended that where practicable, a minimum of 12" clearance be maintained.*

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

CLEARANCES (Continued)

A) For instances where the proximity of the electric facility is less than the minimum required clearance from a gas facility, either facility shall be relocated or phenolic board (Class/Stock #596-4473, 1'x2' or #596-4432, 1'x4') shall be installed between the two facilities. These locations must be entered into the Gas & Electric Clearance Mitigation Report located in the hot sites drop down menu on the @conEdison intranet site. (Reference EO-6224 "Trenching Requirements for Conduit and Equipment Structure for Underground Residential Distribution (URD) Electric System".)

B) For instances where exposed electric conduits in close proximity to gas facilities are found to be deteriorated to the extent that cable is visible, the deteriorated conduits shall be removed. If it can be ascertained that the cable installation is visibly damaged or further guidance is required to repair the damaged conduits, contact the applicable Electric Operations' Control Center to coordinate the replacement of the damaged cable prior to any repair. (See Corporate Instruction CI-920-1 "Gas Facilities – Clearances, Encroachments, Interference, and Corrosion")

NOTE:	Report locations where phenolic board has been installed or where conduit repair has been made as per Corporate Instruction CI-920-1

C) For instances where 6 inches cannot be maintained between a water or sewer facility and the gas service, either facility shall be relocated or water impingement rubber mat(s) (Class/Stock #059-5306, 2' x 2' x ½" mat) shall be installed between the two facilities for protection. The rubber matting shall be installed either horizontally over/under the gas service or vertically alongside the gas service (DO NOT wrap the rubber mat around the gas service). The rubber matting shall be installed a minimum of 2" from the gas service and shall **not** be installed "edge to edge". When more than one rubber mat is installed to protect the gas service, the mats shall *overlap* a minimum of 6".

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

CLEARANCES (Continued)

★ D) For instances where 35 feet cannot be maintained between a steam facility and the PE plastic gas service, the PE plastic gas service shall be relocated or the gas service shall be replaced with metallic (e.g., steel or copper) gas pipe. For instances where the proximity of the steam facility is less than 6 inches from a metallic gas service, the metallic gas service shall be relocated or a steam blanket (Class/Stock #415-0108) shall be installed.

★ E) For instances where 6 inches cannot be maintained between a facility other than electric, steam, water, or sewer (e.g., telephone, cable, petroleum) and the gas service, either facility shall be relocated or phenolic board (Class/Stock # 596-4473 or # 596-4432) shall be installed between the two facilities for protection.

PIPING

5.12 Plastic pipe shall be installed so as to minimize shear or tensile stresses. Care shall be taken to prevent kinking and buckling.

5.13 All piping and associated fittings shall be checked for obstructions (e.g. end caps, dirt, debris) prior to tie-in.

5.14 For gas services installed in a casing or conduit, the casing or conduit shall be designed to withstand the superimposed loads.

5.15 Any portion of plastic piping exposed due to the removal of a section of casing or which spans disturbed earth shall be of sufficient strength to withstand the external loading and shearing forces or it shall be protected with a suitable bridging piece.

5.16 Gas services that enter a building from beneath (i.e. through the floor, rather than through the foundation/vaulted wall) the building shall be encased in a gas tight conduit that is vented to the outside atmosphere. (See Gas Drawing EO-16546-B, “Installation of Flexible Sleeve Elbow Unit Where Service Enters From Beneath Building Not Exceeding 99 PSIG”)

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

PIPING (Continued)

5.17 Gas services inserted/installed under an enclosed living space (e.g. an enclosed porch) shall be encased in a gas tight conduit, which is sealed at both ends and vented above ground to the outside atmosphere. If the existing service pipe is to be reused as the conduit, then it must be pressure tested at 3 psig for 5 minutes and documented on the As-Constructed/Emergency Sketch form. It shall also be sealed at both ends and vented to the outside atmosphere. All below ground vent piping shall be coated per applicable Company specifications.

(See Specification G-8096, "Sealing the Annular Space Between a Gas Pipe and a Wall, Casing Pipe, or Sleeve" and Gas Drawing EO-4890-A, "Service Pipe/Tubing And Service Sleeve Through Vault, Open Areaway, Open Area Under Stairs, Under Enclosed Area, And Into Vaulted Basement")

The recommended method to seal and vent the end of the conduit that is in the ground (under an enclosed living space) outside the building is to:

A. Install the appropriate "Renu" coupling from the list below for 1", 1 ½" and 2" pipe sizes with taphole to seal and vent (with vent cap) the end of the conduit (which could be the old service pipe **provided** it passes a 3 psig pressure test for 5 minutes) to the new service pipe/tubing.

1. 1" IPS x ½" CTS with 3/8" vent (Class/Stock # 341-5817)

2. 1 ½" IPS x 1 ¼" CTS with ¾" vent (Class/Stock # 341-5825)

3. 2" IPS x 1 ¼" CTS with ¾" vent (Class/Stock # 341-5833)

OR

B. Tap a hole in the conduit to vent (with vent cap) and install a 3M coldshrink to seal the end of the conduit (which could be the old service pipe provided it passes a 3 psig pressure test for 5 minutes) to the new service pipe/tubing.

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

PIPING (Continued)

5.18 Steel service pipe that is inside a sleeve for more than 10 feet shall be supported by insulating skids. (See Gas Specification G-100,280, "Pipeline Casing Insulating Skids")

5.19 Gas services installed through a subsurface vault or open areaway shall be sleeved (with **only** *steel* pipe as the sleeve) and the ends sealed as per Gas Drawing EO-4890-A.

5.20 Gas service piping installed in an open area underneath an outside staircase shall be installed as per EO-4890-A.

Compression fittings are **not** permitted, except as indicated below:

A) **If** the gas service meter is **also** located in an open area **under** an outside staircase, **then** one compression fitting is permitted to be installed.

B) **If** there is a service regulator **and** meter located in an open area **under** an outside staircase, **then** the one permissible compression fitting shall only be installed on the (*low-pressure*) piping between the regulator outlet and meter inlet.

5.21 All above ground outdoor service piping **shall** be metallic.

5.22 New service installations and replacements should be installed perpendicular to the main and should not run at angles.

5.23 Threaded pipe and fittings for gas service piping shall **not** be installed underground **except** for the **first** service connection *fitting* to the main/strap saddle (when required). (See Gas Drawing EO-16645, "Steel/Copper Service Connections to Metallic Mains")

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

PIPING (Continued)

5.24 New and replacement (relayed) services that enter a building (either above ground or underground) through the building's concrete/masonry foundation/vaulted wall, shall enter via a continuous steel or PVC sleeve for a new service or relay or the old service pipe for an insertion. The annular space at each end (between the service pipe and the sleeve or old service pipe) shall be sealed with link-type seals. (See Gas Specification G-8096 and Gas Drawing EO-4890-A for requirements and methods to seal the annular space between the service pipe and the sleeve).

NOTES:	For up to 2" PE service, seal the annular space inside the building with a service head adapter. For a 2" service through a 3" sleeve or a 3" service through a 4" sleeve, use a 2" or 3" gasket accordingly with waterproof caulking material to seal the annular space. (These gaskets are available from Dresser)

5.25 New and replacement services that enter a building aboveground through the building's non-concrete/masonry foundation wall, do **not** require a wall sleeve. Seal the annular space (between the service pipe and the non-concrete/masonry wall) with waterproof caulking material.

5.26 For a service replacement, a compression coupling with a 1/8" threaded plug shall be installed on low-pressure piping at the head of service for possible future use in testing the service pressure.

NOTE:	For compression couplings greater than (>) 2" diameter, then a 1/8" hole shall be drilled, tapped and plugged into the barrel of the coupling.

5.27 Bolts or stud-bolts used shall extend completely through the nuts.

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

PIPING (Continued)

5.28 Transition fittings shall **only** be used when:

A) transitioning a plastic service (when a service head adapter is not used) outside the building wall and through the wall sleeve. The steel end of the transition fitting shall be a threaded/beveled end at the point of entry.

B) making coupled pipe connections and the plastic pipe diameter is 10" (only PE to CI connections) or 16" and above, for which restraining couplings are currently not manufactured.

NOTE: There are restraining couplings for:

- 12" PE to ST
- 12" PE to CI
- 10" PE to ST

(See Gas Specification G-8153, "Reinforcing Compression Fittings")

C) connecting to a tapping tee (weld end) or bottom out fitting at the main.

NOTE: The threaded end of steel pipe or nipples shall not be placed in compression style couplings

5.29 A #10 bonding cable (Class/Stock #563-1361) shall be installed across all steel/copper service piping cut-out sections prior to making the cuts to maintain electrical continuity and eliminate arcing. The bonding cable shall be attached either across the service piping or from service piping to metallic main by thermit weld (on steel piping only), clamp or magnetic connectors.

NOTE: Prior to thermit welding, check the condition of the pipe and also check for the presence of gas.

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

PIPING (Continued)

★ 5.30 Use the Arcless Static Ground (ASG) kits or wet rags/burlap to wrap and ground all plastic pipe/tubing in the excavation prior to disconnecting/cutting the plastic service piping to eliminate static electricity arcing.

VALVES

5.31 All valves shall be checked for proper operation (i.e. opened and closed) prior to installation.

5.32 All services shall have an accessible curb valve. Whenever possible, curb valves shall be installed in the sidewalk.

NOTE:	In Westchester, the curb valves shall be installed in the sidewalk (or unpaved area adjacent to the street).

5.33 Whenever possible, meters and meter/regulator sets shall be installed outdoors.

When meters and meter/regulator sets are installed indoors, they should be installed as close as practical to the POE.

For indoor meter and meter/regulator sets, the service head valve (SHV) must be accessible and shall be installed as follows:

A) Low Pressure Service

1) The indoor SHV shall be installed as close as possible and within 24" (of "running pipe" length) (NYC Fuel Gas Code) from the point the gas service connection enters the building.

NOTE:	This may allow the SHV to be used as a "bypass valve" (for "bypassing" the building) at a future date.

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

VALVES (Continued)

2) For buildings with a vaulted (and accessible) basement, the SHV shall be installed:

- in the vaulted area for a *PE plastic service;*
- either in the vaulted area or the basement for a steel or *copper service.*

B) Intermediate, Medium or High Pressure Service

The indoor SHV shall be **the first fitting** installed inside the building.

C) For a service insertion with a service head adapter, the indoor SHV shall be the first fitting installed onto the service head adapter. However, if a "permanent" obstruction exists, then the SHV shall be installed as close as possible to the service head adapter (provided supervision approves and documents it on 50-13R).

5.34 Where the SHV is located 6 feet or more above the floor level, an operating chain or a permanent access platform shall be installed by the customer.

5.35 The SHV shall be tamperproof (up to and including 4" diameter) and shall be:

A) screw ends for all low pressure services that are 4" or less in diameter;

B) screw ends for all services operating at greater than low pressure that are 2" or less in diameter.

C) flanged (weld neck) ends for all low pressure services that are 6" and larger in diameter;

D) flanged (weld neck) ends for all services operating at greater than low pressure that are 3" and larger in diameter.

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

VALVES (Continued)

NOTE:	The customer must install a flange insulating kit on the downstream side of all flanged end SHVs.

5.36 The curb valve and curb valve box shall be supported with a pre-cast base or bricks. The entire assembly should be placed on well compacted soil. (See Gas Drawings EO-16629-A, "Installation of Steel Gas Service Piping," EO-16641-A, "Installation of Plastic (Direct Burial or Insertion) Gas Service Piping," and EO-16532-A, "Installation of Copper Tubing Gas Service Piping")

5.37 A building bypass valve should be installed for new/replacement services to a building (large apartment, commercial, etc.) that may require future "bypassing".

5.38 Abandoning an Existing Curb Valve

A) To abandon an existing curb valve box in a concrete sidewalk, remove the top of the box or curb valve box cover, backfill up to 3" from the surface and then fill the remaining 3" with concrete. If feasible, break out and remove the top of the box.

B) To abandon an existing curb valve box in a soil area, remove the top of the box and fill with suitable material.

REGULATORS

5.39 Each service regulator for a new/replacement service (**except** for service replacements by insertion) must be installed **outside** of the building, unless it is impractical or unsafe.

When the service regulator must be installed within the building:

A) the service regulator shall be installed as close as practical to the SHV (see the below chart) and the location of the curb valve shall be indicated on a tag attached to the regulator vent cap. (See Gas Specification G-8028, "Requirements for Indicating the Location Of The Curb Valve Box On A Gas Service With An Indoor Regulator")

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

REGULATORS (Continued)

Service Pipe Diameter	Maximum Distance from SHV to Regulator "running pipe" Length
≤ 2"	4 feet
> 2" and ≤ 4"	8 feet
> 4" and ≤ 8	15 feet
> 8"	20 feet

NOTE: For footage distance in excess of the above chart, see the gas meter equipment section of the Company's "A Customer Guide to Gas Service Installation" (Yellow Book) for additional requirements that must be met to allow the excess linear footage of "running pipe" between the SHV and the regulator.

B) For regulator vent installation requirements, refer to Gas Drawing EO-17118, "Regulator Vent Installation."

5.40 For buildings in flood zones with indoor or outdoor service regulators, vent lines should be elevated so the terminus is 3 feet above the base flood elevation (BFE). If this is not feasible, a Vent Line Protector (VLP) shall be installed on the vent line to prevent water intrusion. (See Gas Specifications G-8217, "Flood-Prone Areas for the Installation of Gas Service Regulator Vent Line Protectors (VLP's)" and G-699, "Installation and Inspection of Gas Service Regulator Vent Line Protectors (VLPs)"

DOCUMENTATION AND RECORD OF WORK

5.41 Prepare and submit an as-constructed/emergency sketch (e.g. one-line sketch or red-lined layout) and associated paperwork necessary for mapping for all installations, replacements, or abandonments of gas mains and services as per CI-940-1 "Processing Gas Mapping Information."

5.42 For additional information on the requirements, responsibilities, and timetables for updating gas maps and records refer to Corporate Instruction CI-940-1, "Processing Gas Mapping Information".

5.0 **GENERAL REQUIREMENTS FOR SERVICE INSTALLATIONS** (Continued)

DOCUMENTATION AND RECORD OF WORK (Continued)

★ 5.43 A Hold Point Inspection shall be completed and documented for any new gas distribution service installation (including partial service replacements, customer pipe installations, and GD-3 service replacements) prior to backfill. (See GAS6042).

5.44 Electrically powered equipment shall **never** be used on a gas service.

EXCEPTION:	Welding/fusion equipment and equipment approved by Corrosion Control and the Gas Development Lab.

5.45 Welding or cutting shall not be performed on pipe or pipe components that contain a combustible mixture of gas and air in the area of work. Post warning signs where appropriate.

5.46 Purging equipment and purge pipes shall be electrically bonded to the main/service or ground as required. See Specification G-8129 "Purging Gas Mains, Services and Regulator Stations."

★ 5.47 Refer to Gas Specification IP-16, “Operation, Maintenance, Handling and Storage of the Modular - Style, Compressed Natural Gas (CNG) Bypass Cart” or IP-46, “Bypassing a Gas Service from a Gas Main” for bypassing a building.

5.48 Care shall be exercised to avoid rough handling of plastic pipe and tubing. It shall not be pushed or pulled over sharp projections, dropped or have other objects dropped upon it.

5.49 Each length of pipe and each other component must be visually inspected at the site of installation to ensure that it has not sustained any visually determinable damage that could impair its serviceability. These inspections must be made:

A) prior to the coating operation for field coated pipe; and

B) as the pipe is lowered into the excavation.

6.0 SERVICE CONNECTIONS TO MAINS

6.1 For service connections to mains, see Appendix G-1 through G-3.

NOTE:	The method of service connection to the main should be documented on the paperwork for the job.

6.2 Whenever practical, all service connections to a main should be located at the top of the main. If not practical, then the service connection shall be located at the side of the main.

6.3 For all pressures, reuse existing "welded" tee if found in good condition.

6.4 When offsets are required to connect a service to the main (i.e. “looped service”), the offset should be kept as close as possible to the main to reduce the possibility of a future damage to the service-to-main connection. Note on sketch as “looped service” with measurements.

6.5 All tapping/drilling shall **only** be performed with approved tapping/drilling equipment. Under no blow conditions, only tapping/drilling equipment designed to be used for no blow shall be used.

NOTE:	The use of a hole saw and air drill to “drill a hole” (on live or dead main) **is prohibited.**

6.6 For cast iron, steel, or wrought iron pipe, the pipe must be reinforced when the diameter of the tap hole exceeds 25% of the nominal diameter of the pipe. See Table 1 for maximum tap hole size without reinforcement.

EXCEPTIONS:

A) A 1” tap hole can be drilled and threaded in a 3” steel or wrought iron main without reinforcement.

B) A 1¼” tap hole can be drilled and threaded in a 4” steel or wrought iron main without reinforcement.

C) A 1¼” tap hole in a 4” cast iron main must have a strap saddle (double strap) installed for the threaded connection.

D) A 1½” ” tap hole in a 6” cast iron main must have a strap saddle (double strap) installed for the threaded connection.

6.0 **SERVICE CONNECTIONS TO MAINS** (Continued)

6.7 Table 1, **Metallic Main Tap Hole Sizes**

Main Size	Maximum Tap Hole Size Without Reinforcement
3”	1”
4”	1 ¼ ” *
6”	1 ½” *
8”	2”
10”	2 ½”
12”	3”
16"	4"
18"	4"
20"	5"
24"	5"
30"	5"
36"	5"

** See EXCEPTIONS for cast iron in Section 6.6*

6.8 Where the maximum “tap hole” size indicated in Section 6.7 will be exceeded, the main shall be reinforced as follows, and an anode bag shall be installed on the strap saddle or sleeve as per Gas Specification G-8205, “Corrosion Control of Buried Steel Gas Distribution Mains and Services.”

A) Installed with either a strap saddle or clamp for a 1½” drilled only hole in a 4” cast iron, steel or wrought iron main.

B) Installed with either a strap saddle or clamp for a 2” drilled only hole in a 4” or 6” cast iron, steel, or wrought iron main.

C) Reinforced with a Style 50, Style 80 or “approved special order fitting” (i.e., green sleeve) for cast iron mains.

D) Reinforced with a welded fitting (i.e., tapping tee) or “approved special order fitting” (i.e., green sleeve) for steel or wrought iron mains.

6.0 **SERVICE CONNECTIONS TO MAINS** (Continued)

6.9 When installing a plug into a taphole, the plug shall be placed on top of a cleaned area on the main (**prior** to removing tapping equipment or **prior** to disconnecting a service) and shall be slid (in contact) across the main and screwed into the taphole.

6.10 All service connections to 6" and smaller cast iron mains shall be connected to the cast iron main using an insulated strap saddle (double strap) or similar approved fitting. (See Gas Drawing EO-16645

NOTE:	It is not necessary to tap and thread the hole when using a strap saddle or other threaded reinforcement fitting.

6.11 Intermediate and medium pressure services connected to 8" - 12" cast iron mains shall be connected using an insulated strap saddle or similar approved fitting (See Gas Drawing EO-16645)

6.12 Welding of no blow tapping tees is **always** an acceptable service connection to steel. Intermediate, medium and high pressure services connected to a steel main should be connected by welding a no-blow tee to the steel main. Only when welding is impractical, can an insulated strap saddle with a threaded no-blow tee be used to connect the service to a steel main. Catching gas on the fly is **only** permitted as specified in Gas Specification IP-30, "Procedure for Removing or Replacing Live Intermediate, Medium and High Pressure Gas Pipe and/or Fittings Without No-Blow Equipment."

6.13 For all 2" and smaller diameter low pressure PE plastic services, the **preferred** connection is to install the plastic brass based tee **directly** into the main or insulated strap saddle (as required in Section 6.8). See Appendices H-1 and H-2 for installation requirements of plastic brass-based tees.

NOTE:	When field conditions do not allow for the installation of the plastic brass based tee, the angle valve tee, posilock tee or riser/threaded tee may be installed.

6.0 SERVICE CONNECTIONS TO MAINS (Continued)

★ 6.14 PE plastic electrofusion service connections to PE plastic pipe do not require reduced electrofusion times (including connections to PE plastic pipe with SDR greater than (>) 15.5). (See Gas Specification IP-27)

6.15 An air drill or other high speed pneumatic device shall **not** be used to "drill" the **"cookie-cutter"** down the PE plastic tee, through the plastic main and back up the plastic tee.

7.0 EXCESS FLOW VALVES

7.1 Excess Flow Valves (EFVs) shall be installed on all new or replaced services to single family residences supplied by *high-pressure* regardless of load and new or replaced (including partial replacements) ***high-pressure*** non-single family residence services (e.g. multi-family residences) and/or commercial buildings which use a meter up to and including a ***class 1000 meter*** *or* equivalent (e.g. two (2) class 500 meters, four (4) class 250 meters, one (1) class 500 and two (2) class 250 meters). See Appendix J: "Excess Flow Valve (EFV) Installation Examples for Single and Branch Services" for graphical representation; and EO-16641: "Installation of Plastic (Direct Burial or Insertion) Gas Service Piping" for approved EFVs.

NOTE: An EFV is required for a partial service replacement only if the replacement segment is near the service-to-main connection (where an EFV is usually located). An EFV is not required for a partial service replacement if the replacement segment is far away from the main-to-service connection because EFVs in those locations may not provide excavation-damage protection.

★ 7.2 The following rules apply to all EFV installations:

A) EFVs shall **not** be installed on services operating at low, intermediate or medium pressure.

B) EFVs shall **not** be installed where contaminants in the gas stream could interfere with the EFV operation or cause loss of service.

C) EFVs shall **not** be installed where it could interfere with necessary operation or maintenance activities, such as blowing liquids from the line.

7.0 **EXCESS FLOW VALVES** (Continued)

★ D) Only the EFVs shown in drawing EO-16641 and approved by the Gas Development Lab shall be installed.

E) **For an outdoor meter installation,** install the tag (which comes with the EFV) on the "riser" valve.

F) For **an indoor meter installation,** install the tag (which comes with the EFV) on the service head valve.

NOTE:	If there is no access to the premises at the time of the installation of the EFV, secure the EFV tag to the peck vent. When a crew comes to perform the turn-on and has access to the premises, they shall relocate the EFV tag (or install a new EFV tag) from the peck vent to the service head valve.

G) The EFV shall be installed **as close as practical** to the service tee connection at the gas main. See exception below.

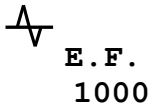
H) For "branch" services, the EFVs shall be installed on each individual service, as close to the "branch connection" as possible.

EXCEPTION:	If there are only two (2) "branch" services and each service has a class 500 meter equivalent (i.e. two (2) class 250 meter), or less (i.e. one (1) class 250 meter), the EFV shall be installed as close as practical to the "branch" service tee connection at the main (i.e. only one EFV is required on the branch service as close as practical to the main).

I) When gassing in or automatically resetting the service, the curb valve, service head and meter valves are to be opened slowly so as not to trip the EFV. Automatic resetting of an EFV can take from 15 seconds to 10 minutes.

7.0 **EXCESS FLOW VALVES** (Continued)

J) Each EFV installation shall be indicated (using this symbol) on the emergency sketch (if applicable), "as constructed" or layout and shall be mapped on the respective mains and services (M&S) plate.



K) Layouts shall indicate where EFVs are required.

8.0 **STEEL SERVICE INSTALLATIONS**

8.1 Steel service piping shall be joined only by personnel, who are "Operator Qualified" in joining the steel pipe by welding or approved mechanical fittings.

NOTE:	Non-restraining couplings shall be reinforced, when required, as detailed in Gas Specification G-8153.

8.2 The following pipe sizes are the smallest to be used for new direct bury steel service installations (Contact Gas Distribution Engineering if less than (<) 2" low pressure or intermediate pressure service is required):

System Pressure	Minimum Pipe Size
Low or Intermediate	2"
Medium	1"
High	1"

★ 8.3 All buried or sleeved steel service pipe, fittings, and buried vent piping shall be coated and separately protected. Cathodic protection shall be in accordance with applicable Company specifications. See Gas Specification G-8205 "Corrosion Control of Buried Steel Gas Distribution Mains and Services". Corrosion Control shall prepare specifications for painting /coating.

8.4 Any portion of a new above ground gas service installation that is exposed to the atmosphere must be cleaned and coated. Coating materials must be suitable for the prevention of atmospheric corrosion.

8.0 **STEEL SERVICE INSTALLATIONS** (Continued)

8.5 Cathodic protection on buried steel gas mains shall be designed to protect the newly installed steel pipeline in its entirety. All new steel installations shall be coated and have adequate cathodic protection in its entirety within one calendar year of the installation of the steel pipeline. Where the pipeline has been installed in segments, the one-year calendar year requirement shall begin when the final segment is energized.

8.6 The cathodic protection of the steel service shall be checked prior to and after backfilling.

8.7 For steel services in unstable soil, offsets using compression end elbows shall be installed to provide flexibility. A brace shall also be installed inside the building wall to prevent pull-out. See Gas Specification G-11831, “Procedure for Checking Areas Where Main and/or Service Movement is Anticipated” for the required service inspections in areas of unstable soil.

8.8 All dents, gouges, grooves or arc burns which affect the curvature of the steel pipe at the weld or compression connection **must** be removed.

8.9 All dents, gouges, grooves or arc burns which have a depth greater than 12-1/2% of the wall thickness (See G-8003) of the steel pipe or as determined by Gas Engineering **must** be removed by cutting out the damaged section as a cylinder. The minimum cylinder length to be removed is one pipe diameter or 12 inches, whichever is greater.

8.10 If coated pipe is installed by boring, driving or other similar method, precautions must be taken to minimize damage to the coating during installation.

8.11 Steel Pipe, Valves, and Fittings

A) See Gas Specification G-8107, "Steel Pipe for Gas Mains and Services" for approved steel pipe.

B) See Gas Specification G-8003 for the inspection, handling, storage, and transportation requirements of steel pipe.

8.0 STEEL SERVICE INSTALLATIONS (Continued)

8.11 Steel Pipe, Valves, and Fittings (Continued)

C) All steel pipe for buried or submerged installations shall be factory coated as per Gas Specification G-8062, "Extruded Polyolefin Coating on Steel Pipe" or field coated as per Gas Specification G-8209, "Field Coating of Steel Gas Pipe and Fittings Installed Underground and in Subsurface Structures".

D) See Gas Specification G-100,298, “Valves for Gas Transmission and Distribution Systems for approved metallic valves.

E) All fittings (e.g. forged tees, elbows, flanges, control fittings, mechanical couplings, etc.) shall meet the requirements of the applicable Purchase and Test (Volume 6) specifications.

8.12 Restrictions

The following materials shall not be installed for buried or submerged installations:

A) ductile iron pipe and fittings,

B) galvanized pipe and fittings,

C) pipe and fittings made from amphoteric metal (e.g. aluminum),

D) pipe, valves, or fittings not approved by Gas Distribution Engineering.

9.0 PE PLASTIC SERVICE INSTALLATIONS

9.1 See Gas Specification G-8104 for approved PE plastic pipe, tubing, and fittings.

9.2 The following pipe sizes are the smallest to be used for new direct bury PE plastic service installations. Contact Gas Distribution Engineering if less than (<) 2” LP or IP service is required.

9.0 **PE PLASTIC SERVICE INSTALLATIONS** (Continued)

System Pressure	Minimum Pipe Size
Low or Intermediate	2" IPS
Medium	1 ¼ " IPS
High	1" IPS

NOTE: 1" CTS and 1 ¼" CTS shall not be installed on any high pressure system. (See Gas Specification G-8200, "Service Sizing")

9.3 PE Plastic pipe with an SDR of 11 or less (i.e. 9.3) is approved for installations up to and including 100 psig and is the **only** plastic pipe to be installed on distribution systems **above** low pressure.

PE Plastic pipe with an SDR of 15.5 has a design pressure rating (70.6 psig) well below the MAOP for most of the CECONY high pressure distribution systems, and therefore cannot be installed in the high-pressure distribution systems.

M8000 pipe was all black and replaced in 1997 with Performance Pipe 8100.

Performance Pipe 6800 is black with two thick yellow stripes at three different points on the pipe's surface.

Performance Pipe 8100 has a "yellow shell" around black pipe. This is the equivalent of Performance Pipe 8300 and JM Eagle (US Poly) UAC3700.

Performance Pipe 8300 is black with one thick yellow stripe at four different points on the pipe's surface and the print line states PE100. This is the equivalent of Performance Pipe 8100 and JM Eagle (US Poly) UAC 3700.

JM Eagle (US Poly) UAC3700 is black with one yellow stripe at three different points on the pipe's surface. This is the equivalent of Performance Pipe 8100 and 8300.

9.0 **PE PLASTIC SERVICE INSTALLATIONS** (Continued)

ENDOT EN PE 4710 (GAS) is black with one thin yellow strip at three different points on the pipe's surface. This is equivalent to Performance Pipe 8300 and JM Eagle UAC3700.

Dura-Line Polypipe GDB50 is black with either one thin yellow stripe at three different points on the pipe's surface (similar to JM Eagle and ENDOT) or one yellow stripe at six different points on the pipe's surface.

9.4 Couplings up to and including 12" shall **only** be a restraining-type (e.g. Dresser Style 711 or CSI Maxi-Grip), so as to prevent pullout due to tensile forces.

EXCEPTION: There are currently **no** 10" PE-CI restraining-type couplings manufactured. (See Section 5.26B)

9.5 The SDR size of the stiffener **must** correspond with the SDR size of the plastic pipe. See Gas Specification IP-20 for the installation of approved mechanical fittings and stiffeners required for PE plastic pipe and tubing.

★ 9.6 Bends in the service can be made by the use of molded elbows or by manually bending the pipe in accordance with the following table:

Plastic Pipe Size	SDR 9.3 Minimum Bending Radius	SDR 11 Minimum Bending Radius	SDR 15.5 Minimum Bending Radius
½" CTS (SDR 7)	1 foot	--	--
1" CTS (SDR 12.5)	--	3 feet	--
1" IPS	--	3 feet	--
1-1/4" CTS (SDR 15.5)	--	--	3 feet
1 1/4" IPS	3 feet	4 feet	--
2" IPS	4 feet	5 feet	--
3" IPS	6 feet	8 feet	--

9.0 **PE PLASTIC SERVICE INSTALLATIONS** (Continued)

Plastic Pipe Size	SDR 9.3 Minimum Bending Radius	SDR 11 Minimum Bending Radius	SDR 15.5 Minimum Bending Radius
4” IPS	8 feet	10 feet	--
6” IPS	--	14 feet	--
8” IPS	--	18 feet	--
10” IPS	--	23 feet	25 feet
12” IPS	--	27 feet	29 feet
16” IPS	--	34 feet	--

The radius of the circular bend in the pipe must be **equal to or greater** than the footage listed above.

9.7 Tape a minimum #14 AWG red or yellow insulated copper tracer wire (e.g. Class/Stock # 563-0040, #12 AWG yellow) to all direct buried plastic service installations at 20 to 30 foot intervals. Bring the tracer wire to the top of the curb box or riser. When bringing tracer wire up into a curb valve box or to a riser the metallic ends of the tracer wire shall be taped or otherwise insulated to prevent direct contact with valve box or metallic surfaces. The use of electrical tape is preferred; however, other means of proper insulation are acceptable.

When extending a tracer wire or connecting a service tracer wire to a main tracer wire, use approved connectors (C/S# 571-0312 and 571-0313).

See Sections 10.2 and 11.6 for tracer wire requirements for trenchless technology and service insertions. Tracer wire may not be wrapped around the plastic pipe and contact with the plastic pipe must be minimized (i.e. just to the contacts for "taping intervals").

Refer to Drawing # 600344: Installation Requirement for Tracer Wire on Mains & Services

9.0 **PE PLASTIC SERVICE INSTALLATIONS** (Continued)

★ 9.8 **GROUNDING**

If conditions exist that a flammable gas - air mixture may be encountered and static charges may be present, such as during gassing-in, purging, a damage, etc., the plastic pipe shall be grounded. This may be done by using the ASG grounding kit or by covering the pipe ends near the opening and also the remaining length of plastic pipe in the work area with wet rags saturated with soap solution to minimize the build-up of static charges. Keep the rags in contact with the soil to provide grounding.

When utilizing hand and/or pneumatically/hydraulically powered tools on plastic pipe/tubing, and a flammable gas-air mixture may exist, always ground these tools to dissipate static electricity charges. Attach a #10 wire (Class/Stock #563-1361) to the tool and a nearby water main, fire hydrant or digging bar in earth (*not soil on a road surface*). In addition, the entire length of plastic pipe/tubing in the work area must be wrapped with ASG kits or wet rags/burlap and kept wet and grounded at each end of the excavation.

When utilizing mechanical or hydraulically powered squeeze-off tools on plastic pipe/tubing, ground these tools utilizing the manufacturer's recommended grounding kit.

For additional information on static electricity and plastic pipe/tubing, refer to Gas Specification G-8178, "Shut-off of Polyethylene Plastic Pipe/Tubing Used for Gas Mains and Services."

9.9 Plastic pipe/tubing shall **not** be installed in the following areas:

A) Above ground, except on bridges as provided in Gas Specification G-8005.

B) Where the temperature of the pipe/tubing is below -20°F or exceeds 100°F.

C) In a subsurface vault or any below grade enclosure (**not** containing therein any steam facilities) unless it is completely encased in a gas tight metal pipe having adequate corrosion protection.

D) Where the soil is saturated with solvents, fuels (e.g. gasoline), or oils.

9.0 **PE PLASTIC SERVICE INSTALLATIONS** (Continued)

E) More than 24" beyond the inner face of the building wall (this includes a building's vaulted area) and the 24" (or less) of plastic pipe/tubing must be fully encased within a steel sleeve or existing service pipe. The plastic service pipe or tubing shall terminate at a transition fitting or service head adapter/basement tee.

The use of an insulok fitting (3/4", 1", 1 1/4", 1 1/2" and 2") as a **"sleeve fitting", not** as a "gas carrier fitting", is **acceptable** for all pressures. When the insulok is used as a "sleeve fitting", the green insulating gasket should be removed since it is not required.

Additionally, plastic piping may extend into a building a maximum of one (1) foot horizontally and four (4) feet vertically, immediately adjacent to the inner face of the building wall when encased in a metallic sleeve and constructed and vented so that uncontrolled gas cannot escape from the metallic sleeve inside the building.

NOTE: In the New York City gas operating areas, when working on (e.g. bypassing, main replacement, service transfer or replacement [full or partial]) a service that was previously inserted with plastic tubing inside the old service pipe through the building's vaulted area, **then** the plastic tubing must be replaced and terminate within 24" of the inner face of the building's vaulted wall.

Cut the old service (used now as a sleeve for the plastic tubing) pipe as close as possible to the building's vaulted basement wall and install an insulok and service head adapter and re-pipe with steel pipe through the vaulted basement area.

F) Within 35 feet of **any** steam facility (Company/private) or in any subsurface structure, inside of which, a steam facility is located (NYC Fuel Gas Code). (See Section 5.9)

★ 9.10 When installing plastic pipe near or below freezing temperatures, care shall be exercised to avoid impact or shock loads. Do not drop pipe or allow it to fall off of the truck or into the trench. Do not strike the pipe or any fittings attached to it with handling equipment, tools, or other objects. Do not drag pipe lengths at speeds where bouncing against the surface may cause impact damage.

9.0 **PE PLASTIC SERVICE INSTALLATIONS** (Continued)

9.11 Prior to installing PE plastic gas or steam facilities south of 97th Street in Manhattan, the following steps shall be taken:

A) Gas Engineering shall review the proposed installation with Steam Engineering to determine the location of existing or planned steam facilities.

Conversely, Steam Engineering shall provide Gas Engineering with preliminary layouts of proposed steam installations to determine the location of existing plastic gas facilities in the area.

B) All gas layouts and sketches designating the installation of plastic gas services south of 97th Street and all steam layouts calling for extension or relocation of the steam system shall be stamped or have wording indicating that the job has been reviewed for the minimum 35' clearance between plastic gas facilities and steam facilities. The reviewing engineering technician in Gas and Steam Engineering shall date and sign the documents or type name and employee number.

The stamp or layout wording shall state, as a minimum, the following:

Steam Facilities within 35' of the plastic gas pipe

Yes ☐ No ☐ (Check One)

(Gas) Signed _____ Employee # _____ Dated _____
(Steam) Signed _____ Employee # _____ Dated _____

9.12 Slack for unstable soil conditions and/or expansion and contraction shall be provided by snaking the pipe within the trench or by installing an expansion loop (check with Gas Distribution Engineering).

NOTE:	See Gas Specification G-11831 for required service inspections in areas of unstable soil.

9.13 The backfilling of new and replacement plastic service pipe should be performed **as soon as possible** to limit expansion and contraction of the plastic pipe and also to avoid possible damage to the plastic pipe.

9.0 **PE PLASTIC SERVICE INSTALLATIONS** (Continued)

9.14 All kinks, buckles, and dents, gouges, grooves etc. which have a depth greater than 10% of the wall thickness (See G-8122) of the plastic pipe/tubing or as determined by Gas Distribution Engineering **must** be removed by cutting out the damaged section as a cylinder. The minimum cylinder length to be removed is one pipe diameter or 12 inches, whichever is greater.

NOTE:	Performance Pipe 8100 pipe/tubing has a "yellow shell" that is 1-2 mils (0.001- 0.002) thick.

9.15 Plastic valves are approved up to and including 16" diameter. Where the same diameter valve comes in reduced port and full port openings (See Appendix C), a full port valve shall be used (unless otherwise noted on a layout or requested by Gas Distribution Engineering).

★ 9.16 PE plastic molded fittings (caps, elbows, reducers, tees and valves) without pup lengths can **only** be joined to plastic pipe/tubing or other molded fittings by butt fusion, electrofusion, or MetFit fittings. (See Gas Specification G-8104 for approved fittings with pup lengths of PE plastic pipe or tubing). (See G-100,285 for approved MetFit fittings). With the exception of MetFit fittings, plastic molded fittings can **not** be joined to plastic pipe/tubing or other molded fittings by mechanical fittings.

Install and inspect MetFit mechanical fittings as per manufacturer's procedures. Molded fittings shall **not** be altered in order to utilize MetFit fittings.

Molded fittings may have machined ends which have a ridged appearance. This appearance is not a peeled or scraped surface that is ready for electrofusion. Similar to pipe. It must be peeled or scraped as required by the electron fustion procedure. (See IP-27)

9.17 A plastic service can be installed directly to a gasoline station building provided that the ground soil is **not** saturated as stated in Section 9.9.

9.18 When steel fittings (e.g. compression couplings) are used with a plastic service installation, they shall be coated and separately protected from any steel or cast/wrought iron main. Steel fittings shall also be insulated from any copper tubing. Cathodic protection shall be in accordance with applicable Company specifications.

9.0 **PE PLASTIC SERVICE INSTALLATIONS** (Continued)

9.19 Heat fusion of PE plastic pipe, tubing, and fittings of different SDR wall thickness shall only be performed between **one change in SDR.**

SDR	7	⇔	9/ 9.3	⇔	11	⇔	13.5	⇔	15.5

Joining of PE plastic pipe, tubing, and fittings with SDR wall thickness **greater than one change in SDR** shall be electrofused. Approved restraining-type mechanical couplings may only be used for joining PE plastic pipe and tubing when an electrofusion coupling is unavailable. (See Appendix A, “Approved Joining Methods for PE Plastic Pipe” and Gas Specifications IP-20 and G-8209)

9.20 Inspect PE plastic pipe, tubing, and fittings prior to installation to verify:

1. No cuts, gouges, deep scratches, or other defects.

2. PE plastic material is high density polyethylene (HDPE), PE3408/4710, and manufactured per ASTM D2513.

3. PE plastic material is NOT older than 10 years old.

(See Gas Specification G-8122, "Transportation, Handling, and Storage of Polyethylene Plastic Pipe/Tubing, and Fittings for Gas Mains and Services")

9.21 Any pre-existing plastic joints exposed during the installation of a service and/or main shall be inspected by an Operator Qualified Individual.

9.22 **PE Plastic Pipe, Valves, and Fittings**

A) See Gas Specification G-8104, "Polyethylene Pipe, Tubing, and Fittings for Gas Mains and Services” for approved PE plastic pipe, tubing, and fittings.

B) See Gas Specification G-8122, “Inspection, Handling, Storage, and Transportation of Polyethylene (PE) Plastic Pipe, Tubing, and Fittings for Gas Mains and Services” for the inspection, handling, storage, and transportation requirements of PE plastic pipe, tubing, and fittings.

9.0 PE PLASTIC SERVICE INSTALLATIONS (Continued)

9.22 PE Plastic Pipe, Valves, and Fittings (Continued)

C) See Gas Specification G-100,298 for approved PE plastic valves

9.23 Restrictions

The following materials shall not be installed for buried or submerged installations:

A) used PE plastic pipe, and

B) pipe, valves, or fittings not approved by Gas Distribution Engineering.

10.0 TRENCHLESS TECHNOLOGY

10.1 In Vicinity of Mains With an MAOP Greater Than or Equal to 125 PSIG

The use of trenchless technology (i.e. directional boring, hole hog, bullet, etc.) **within 5 feet** (radial distance) running parallel or crossing gas mains/services operating at greater than or equal to 125 psig; 69 KV, 138 KV & 345 KV oil-o-static pipelines and fiber optic communication lines is **prohibited**.

NOTE:	This does **not** include insertion, PIM or Con-Split. For PIM and Consplit, a minimum of 3 feet radial distance is required.

The use of trenchless technology is permitted for radial distances greater than 5 feet and less than 15 feet **provided that** Gas Distribution Engineering is contacted to determine the number and location of test pits that are required.

The use of trenchless technology is permitted for radial distances of 15 feet or greater

10.2 Plastic Pipe

When using trenchless technology (e.g. PIM, directional boring, hole hog, bullet) to install plastic pipe, no sleeve is required.

10.0 **TRENCHLESS TECHNOLOGY** (Continued)

Plastic Pipe (Continued)

> **NOTE:** For pipe bursting of steel, contact the Field Engineer for sleeve requirement.

Trace-Safe Kevlar-coated, yellow, #19 AWG tracer wire (manufactured by Neptco spot buy to 800-354-5445 or www.trace-safe.com) (non-stock) shall be taped to the plastic pipe at appropriate intervals. Bring the tracer wire to the top of the curb valve box or riser.

When bringing tracer wire up into a curb valve box or to a riser the metallic ends of the tracer wire shall be taped or otherwise insulated to prevent direct contact with valve box or metallic surfaces. The use of electrical tape is preferred; however, other means of proper insulation are acceptable.

When extending a tracer wire or connecting a service tracer wire to a main tracer wire, use approved connectors (C/S# 571-0312 and 571-0313).

Tracer wire may not be wrapped around the plastic pipe and contact with the plastic pipe must be minimized (i.e. just to the contacts for "taping intervals").

10.3 If coated pipe is installed by boring, driving or other similar method, precautions must be taken to minimize damage to the coating during installation.

10.4 Appropriate excavations shall be made to determine the location of buried facilities (e.g. water, sewer and sewer laterals, telephone, electric, etc.)

★ 10.5 When using trenchless technology for pulling PE plastic pipe/tubing, ensure that a weak link (see Section 3.19) is used to prevent damage to PE plastic pipe/tubing. Contact Gas Distribution Engineering for guidance.

11.0 **PLASTIC/COPPER TUBING SERVICE INSERTION INSTALLATION**

11.1 Plastic tubing shall be joined only by personnel, who are “Operator Qualified” in joining the plastic tubing by butt fusion, branch saddle fusion, electrofusion, and/or approved mechanical fittings. (See Section 5.2)

11.0 **PLASTIC/COPPER TUBING SERVICE INSERTION INSTALLATION**
(Continued)

Copper tubing shall be joined only by personnel, who are Operator Qualified in joining copper tubing by approved mechanical fittings.

11.2 Brass couplings shall **only** be used to connect a copper-to-copper connection. They shall **not** be used for a plastic-to-plastic connection or a plastic to copper connection.

11.3 All copper tubing and plastic tubing in CTS sizes (except for 1/2" CTS) that is found direct buried or is direct buried as part of an insertion shall have a protective sleeve installed (around the tubing) to protect the tubing from damage. (See Section 5.15)

11.4 Protective bushings must be installed on the ends of the existing service pipe (after the pipe is cut, removed and reamed) and **prior** to insertion to protect the plastic or copper from damage.

11.5 The leading open end of the plastic or copper must be sealed prior to insertion.

11.6 A minimum #14 AWG red or yellow insulated copper tracer wire (e.g. Class/Stock # 563-0040, #12 AWG yellow) shall be taped to the plastic tubing at appropriate intervals. Bring the tracer wire to the top of the curb valve box or riser.

When bringing tracer wire up into a curb valve box or to a riser the metallic ends of the tracer wire shall be taped or otherwise insulated to prevent direct contact with valve box or metallic surfaces. The use of electrical tape is preferred; however, other means of proper insulation are acceptable.

Before pipe insertion, jump the gaps in the casing with tracer wire and thermit weld the tracer wire to each end of the casing.

Tracer wire may not be wrapped around the plastic pipe and contact with the plastic pipe must be minimized (i.e. just to the contacts for "taping intervals").

When extending a tracer wire or connecting a service tracer wire to a main tracer wire, use approved connectors (C/S# 571-0312 and 571-0313).

11.0 **PLASTIC/COPPER TUBING SERVICE INSERTION INSTALLATION**
(Continued)

11.7 If tracer wire cannot be inserted with plastic pipe or when tight tolerances between the casing and plastic tubing prohibit the installation of tracer wire, jump the gaps of the casing/sleeve with tracer wire and attach with thermit weld (i.e. thermit weld a tracer wire on each end of the casing). If thermit weld is not practical, see Section 11.8, below.

Refer to Dwgs: 600344, EO-14838-B, EO-16641-A

11.8 The preferred practice is for tracer wire ends to be attached to the casing/sleeve via thermit weld. If thermit weld is not practical, such as when connecting to previously inserted plastic, an approved mechanical grounding clamp shall be used:

- C/S # 342-0073 for ½" to 1" pipe
- C/S # 342-0074 for 1-¼" to 2" pipe

Metallic pipe or sleeve must be cleaned and brought to shiny metal at the point of tracer wire connection. Use no-oxide-grease (C/S# 625-0088) on serrated teeth of the cast bronze clamp.

Contact Corrosion Control for guidance on clamps for pipe sizes greater than 2", if thermit weld is not feasible.

11.9 The plastic or copper shall be inspected before and after insertion to detect any dents, gouges, grooves, etc.

11.10 All dents gouges, grooves, etc. which have a depth greater than 10% of wall thickness for copper or PE plastic, or as determined by Gas Engineering must be removed by cutting out the damaged section as a cylinder. The minimum cylinder length to be removed is one pipe diameter or 12 inches, whichever is greater. (See G-8122 for Plastic Pipe Defect Chart and Appendix E for Copper Tubing Defect Chart)

11.11 Each and every end of the existing service pipe, shall be sealed (between the old service pipe and new tubing) to prevent migration of gas or water.

NOTE: The recommended method to seal is by using the 3M cold shrink or "Slipseals." (See Gas Specification G-8096)

11.0 **PLASTIC/COPPER TUBING SERVICE INSERTION INSTALLATION**
(Continued)

11.12 When steel fittings are used with a plastic or copper insertion, they shall be coated and separately protected from any steel or cast/wrought iron main. Steel fittings shall also be insulated from any copper tubing. Cathodic protection shall be in accordance with applicable Company specifications.

11.13 The pressure ratings for PE plastic tubing are as follows:

SIZE	LOW PRESSURE (LP)	INTERMEDIATE PRESSURE (IP)	MEDIUM PRESSURE (MP)	HIGH PRESSURE (HP)
1/2" PE CTS	Yes	Yes	Yes	Yes
1" PE IPS	Yes	Yes	Yes	Yes
1" PE CTS	Yes	*	*	**No**
1 1/4" PE IPS	Yes	Yes	Yes	Yes
1 1/4" PE CTS	Yes	*	*	**No**

***** CTS tubing should **not** be installed in the event of a future MAOP upgrade

11.14 The backfilling of the new/replacement section of tied-in PE plastic/copper tubing should be performed **as soon as possible**, so as to limit the expansion and contraction of the PE plastic tubing and also to avoid possible damage to the PE plastic/copper tubing.

★ 11.15 The following items are also applicable to PE plastic insertions.

A) for static electricity and plastic pipe/tubing, see Section 10.8. Also see Specification G-8178.

B) for SDR size and stiffener, see Section 9.5.

C) for plastic tubing inside a building's vaulted area, see Section 9.9.

D) for areas where plastic tubing cannot be installed, see Section 9.9.

11.0 PLASTIC/COPPER TUBING SERVICE INSERTION INSTALLATION (Continued)

E) for administrative controls for plastic pipe/tubing in steam areas in Manhattan, see Section 9.10.

F) for plastic insertion in unstable soil, see Section 9.11.

G) for cathodic protection of steel fittings used on plastic tubing, see Section 9.17.

H) for a plastic service insertion to a gasoline station building, see Section 9.9. It may be necessary to excavate test pits over the inserted service to ensure the soil is not saturated with fuels or oils.

★ I) MetFit couplings shall not be installed within sleeves or casings.

12.0 PRESSURE TEST, PURGING AND GAS-IN

12.1 Pressure test the gas service as per Specification G-8204, “Pressure Testing Requirements for Gas Mains and Services”.

12.2 PE plastic (i.e., electrofusion tapping tees, SPA saddles) and metallic tapping fittings used for service connections shall be pressure tested to 90 psig for LP, IP, and MP or 150 psig for HP prior to drilling and/or tapping. Alternately, if not feasible to do so, the service connections to the main can be given a leak test (i.e., soap tested) at operating pressure and documented as part of the pressure test when placed into service.

12.3 Following the successful completion of the service pressure test, purge the service pipe/tubing as per G-8129 and gas-in the service pipe/tubing and leak test the tie-in points at service line pressure.

The gas-in of a service replacement (where the building is “on bypass”) should be performed **from** the building **out to** the main.

NOTE: When installing 1-1/4” angle valve tee, utilize the 1/8” test plug to gas in.

When it is necessary to gas-in **from** the main **to** the building, the gas must be vented to outside the building via a continuous temporary pipe/tubing connection. **Never** vent the gas into a building during gas-in.

13.0 RECORDS RETENTION

Any records generated in the course of performing work in accordance with this specification shall be maintained as required by Corporate Instruction CI-870-1 "Records Management". Guidance on the retention of Company Gas Operations records can also be found on the Records Management intranet site.

★ 14.0 REFERENCES

Bypassing Building

Operation, Maintenance, Handling and Storage of the Modular - Style, Compressed Natural Gas (CNG) Bypass Cart	IP-16
Bypassing a Gas Service from a Gas Main	IP-46

Casing Installations

Sealing the Annular Space Between a Gas Pipe and a Wall, Casing Pipe, or Sleeve	G-8096
Typical Casing End Seal For Steel Main in Cast Iron Casing	EO-14800-C

Clearances

Gas Facilities – Clearances, Encroachments, Interference, and Corrosion	CI-920-1

Inactive Services

Procedure for Maintaining and Abandoning Inactive Gas Services	G-11833

Contractor/Per Diem

Qualification of Contractors' Maintenance Engineers and Field Supervisors Engaged in Gas Maintenance / Installation of Mains and/or Services	G-8195

Corrosion Control

Field Coating of Steel Pipe and Fittings Installed Underground and in Subsurface Structures	G-8209
Electrical Spark Inspection of Coating on Steel Pipe	G-8201
Corrosion Control of Buried Steel Gas Distribution Mains and Services	G-8205
Corrosion Testing on Buried Steel Gas Mains and Services	G-11830

★ 14.0 **REFERENCES** (Continued)

Fittings

★ Segmenting Long Radius Forged Elbows	EO-14620-C

Gas Main Installation

General Specification for the Installation of Gas Distribution Mains	G-8005

Gas Operations EH&S Instructions

Handling Auto Seal in Gas Mains	GAS0025
Handling Gas Services Containing Epi-Seal	GAS0027

CEHSPs, GEHSIs And AMMs

Asbestos Duct Seal Removal Or Minor Disturbances	AMM 6.03
Asbestos Gasket Removal-Gas	AMM 6.10
Clear Access To Customer Premises	AMM 6.02
Coal Tar Wrap Removal – Gas Electric and Fuel Oil.	AMM 6.04
Environment, Health and Safety Considerations in Project Engineering and Planning	CEHSP A11.03
Protection of Natural Resources	CEHSP E09.01
Excavated Soils on Property Not company owned	GEHSI E05.11
Gas Drip Water, Drip Pots and Drip Pot Liquids	GEHSI E06.08
Hazardous Non-PCB Contaminated Soil	GEHSI E06.12
Liquids and Solids from Natural Gas Mains During Mains Cutouts	GEHSI E06.11
Mercury-Containing Equipment	GEHSI E06.06
Paint Chips	GEHSI E06.04

★ 14.0 **REFERENCES** (Continued)

CEHSPs, GEHSIs And AMMs (Continued)

Valve Test Boxes	GEHSI E02.10
Wetlands and Protected Open Waters	GEHSI E13.01
Managing Wildlife	GEHSI E13.02
Working Near City Owned Trees and or Within NYC Department of Parks and Recreation	GEHSI E13.03

Joining of Plastic Pipe

Qualification of Installers Joining Polyethylene (PE) Plastic Pipe/Tubing and Fittings for Gas Mains and Services.	G-8121
Heat Fusion Joining of Polyethylene (PE) Plastic Pipe/Tubing and Fittings For Gas Mains and Services	G-8123
Installation of Mechanical Fittings for Polyethylene (PE) Plastic Pipe and Tubing	IP-20
Installation of Electrofusion Fittings on Polyethylene (PE) Plastic Pipe/Tubing and Molded Fittings Using a Universal Electrofusion Processor	IP-27

PE Plastic Pipe

Polyethylene Pipe, Tubing, and Fittings for Gas Mains and Services	G-8104

★14.0 **REFERENCES** (Continued)

PE Plastic Pipe (Continued)

Inspection, Handling, Storage, and Transportation of Polyethylene (PE) Plastic Pipe, Tubing, and Fittings for Gas Mains and Services — G-8122

PE Plastic Pipe Installation

Shut-Off Of Polyethylene Plastic Pipe/Tubing Used For Gas Mains and Services — G-8178

Steel Pipe

Extruded Polyolefin Coating on Steel Pipe — G-8062

Steel Pipe for Gas Mains and Services — G-8107

Plugs

Wood Plugs for Use with Cast Iron and Steel Pipes — EO-3942-C

PPE

Requirements for Airline Respirator (ALR), Flame Retardant Coveralls (FRC), Harness and Line (H/L) and Harness and Gantry (H/G) — IP-42

Pressure Testing

Pressure Testing Requirements for Gas Mains and Services — G-8204

Purging

Purging Gas Mains, Services and Regulator Stations — G-8129

Reinforcement

Reinforcing Non-Restraining Compression Fittings — G-8153

Maintenance and Replacement of Gas Services

Responsibility for Maintenance and Replacement of Gas Services — G-8149

Service Connections

Steel/Copper Service Connections to Metallic Mains — EO-16645

★14.0 **REFERENCES** (Continued)

Service Installation

Installation of Copper Tubing Gas Service Piping	EO-16532-A
Installation of Flexible Sleeve Elbow Unit Where Service Enters From Beneath Building Not Exceeding 99 PSIG	EO-16546-B
Installation of Meter Piping For Class 250 TC to 1000 TC Diaphragm Gas Meters – Outdoors	EO-16585-A
Installation of Steel Gas Service Piping	EO-16629-A
Installation of Plastic (Direct Burial or Insertion) Gas Service Piping	EO-16641-A
Service Sizing	G-8200
Procedure for Inspecting Mains and Services in Areas with Potential for Subsidence	G-11831
Pipeline Casing Insulating Skids	G-100,280
Procedure for Removing or Replacing Live Intermediate, Medium and High Pressure Gas Pipe and/or Fittings Without No-Blow Equipment	IP-30
Using the “Renu” Method to Bypass a Building	IP-39
Bumper Installation	502163

Street Opening

Street Opening Color Coding, Permit Signs at Worksite and Pavement Restoration Markers	G-8194

Trenching and Backfill

General Specification for Backfilling of Trench and Small Openings	EO-1181
General Backfill and Bedding Material for Excavation	EO-8085
Trench Excavation for Gas Mains & Services Up to 350 PSI	309495

★14.0 **REFERENCES** (Continued)

Trenching and Backfill (Continued)

Installation of Electronic Markers on Gas Mains and Services	502664
Installation Requirement for Tracer Wire on Mains & Services	600344
Protective Covers for Gas Main and Service Installations	EO-6799-C
Sheeting for Trenches and Excavations	EO-16954-B
Plywood Sheeting for Trenches and Excavations	EO-16965-B

Valves

Requirements for Indicating the Location Of The Curb Valve Box On A Gas Service With An Indoor Regulator	G-8028
Installation of Valves on Gas Distribution Mains	G-8141
Installation of 6", 8" and 12" Polyethylene Gas Valves	309808
Installation of 4"-36" Welded End Ball Valve and Valve Box	EO-13911-A

Vaults/Enclosed Areas

Service Pipe/Tubing And Service Sleeve Through Vault, Open Areaway, Open Area Under Stairs, Under Enclosed Area, And Into Vaulted Basement	EO-4890-A

Common Ground Alliance (CGA) letter dated 9/30/03 to DOT, RSPA on CGA Best Practice on Minimum 12" Radial Separation

Vents

Regulator Vent Installation	EO-17118
Installation and Inspection of Gas Service Regulator Vent Line Protectors (VLPs)	G-699
Flood-Prone Areas for the Installation of Gas Service Regulator Vent Line Protectors (VLP's)	G-8217

★14.0 **REFERENCES** (Continued)

Welding

Shielded Metal Arc Welding Procedure for Welding Steel Pipe and Fittings	G-1064
Qualification of Welders and Welding Procedures	G-1065
Radiographic Inspection of Pipeline Welds	G-1070

15.0 **APPENDICES**

Appendix A	(Deleted)
Appendix B	(Deleted)
Appendix C	PE Valves
Appendix D	(Deleted)
Appendix E	Copper Tubing Defect Chart
Appendix F	(Deleted)
Appendix G-1	Plastic Service Connections to Plastic Mains
Appendix G-2	Plastic Service Connection to Cast Iron, Steel and Wrought Iron Mains
Appendix G-3	Steel Service Connections to Cast Iron, Steel and Wrought Iron Mains
Appendix H-1	Installation Requirements for the Plastic Brass-Based Tee
Appendix H-2	Installation Requirements for the Plastic Brass-Based Tee
Appendix I	(Deleted)
Appendix J	Excess Flow Valve (EFV) Installation Examples for Single and Branch Services

Appendix A Has Been Deleted

Appendix B Has Been Deleted

APPENDIX C

PE VALVES

SIZE	BORE	*BORESIZE*	CV	EQUIV LENGTH	OVERALL LENGTH No Pups	WEIGHT
1/2"CTS	Full	1.01"	7	0.94'	12.00"	1.0 lbs
1"CTS	Full	1.01"	33	2.0'	12.00"	1.0 lbs
1"IPS	Full	1.01"	42	2.6'	12.00"	1.0 lbs
1 1/4" CTS	Full	1.38"	100	1.5'	12.00”	2.0 lbs
1 1/4" IPS	Full	1.38"	100	1.6'	12.00”	2.0 lbs
2"	Full	1.85"	175	3.8'	14.7"	3.8 lbs
3"	Full	2.5"	390	5.3'	15"	8.0 lbs
4"	Full	3.62"	700	5.8'	20"	19.5 lbs
6"	Full	5.22"	1,800	6.1'	20"	38 lbs
8"	Full	6.66"	3,650	5.5'	69.5"	66.4 lbs
12"	Full	9.9"	7,000	10.6'	83.8"	305 lbs
16”	Full	11.5”	Info Pending	Info Pending	88.3”	365 lbs

Appendix D Has Been Deleted

APPENDIX E

COPPER TUBING CHART
MAXIMUM PERMISSIBLE DEFECT

Nominal Size	Outside Diameter	Minimum Wall Thickness	Maximum Permissible Defect
1/2”	0.625”	0.049”	.005”
1”	1.125”	0.065	.007”
1 1/4"	1.375”	0.065	.007”
2”	2.125”	0.083	.008”

Appendix F Has Been Deleted

APPENDIX G-1

PLASTIC SERVICE CONNECTIONS TO PLASTIC MAINS (ALL PRESSURES)

Service Size

Main Size	1/2" CTS	1" CTS	1" IPS	1-1/4" CTS	1-1/4" IPS	2" IPS	3" IPS	4" IPS	6" IPS	8" IPS	10" IPS	12" IPS
1-1/4" IPS	1		1		9							
2" IPS	1	1	1	1	1	1						
3" IPS	1	1	1	1	1	1	9					
4" IPS	1	1	1	1	1	1	2	9				
6" IPS	1	1	1	1	1	1	3	4	9			
8" IPS	1	1	1	1	1	1	5	6	6	9		
10" IPS	7	7	7	7	7	7	8	8	8	8		
12" IPS	1	1	1	1	1	1	8	8	8	8		9

Service to Main Connection

1) Electrofuse Tapping Tee
2) Development Lab to electrofuse 4" X 4" branch saddle & "hot tap" (and install plastic reducer as needed.)
3) Development Lab to electrofuse 6" X 3" branch saddle & "hot tap"
4) Development Lab to fuse 6" X 4" branch saddle & "hot tap"
5) Development Lab to electrofuse "specially purchased" Friatec 8" X 4" branch saddle & "hot tap" (and install plastic reducer as needed.)
6) Development Lab to fuse 8" X 4" or 8" X 6" branch saddle & "hot tap"
7) Install IPEX 10" – 16" X 2" electrofuse tapping tee and install plastic reducer as needed
8) Development Lab to fuse 12" X 4" or 12" X 6" or 12" X 8" branch saddle and "hot tap" (and install plastic reducer as needed.)
9) Perform plastic main cut-out with full plastic main tee

Note: If field conditions prohibit service/main connection specified above or for service/main combinations not listed, contact Gas Distribution Engineering for guidance and written confirmation.

APPENDIX G-2

PLASTIC SERVICE CONNECTIONS TO STEEL, WROUGHT IRON, AND CAST IRON MAINS

Service Size

Main Size - Steel or Wrought Iron

	≤ 1-1/4"	2"	3"	4"	≥ 6"
2" LP	1 or 2	1 or 2			
2" IP, MP & HP	1 or 2	1 or 2			
4" LP	1, 2, 4, 5, 12 or 13	1, 2, 4, 5 or 13	1 or 6	1 or 6	
4" IP, MP & HP	1, 2 or 5	1, 2 or 5	1 or 6	1 or 6	
6" LP	1, 2, 4, 5, 12 or 13	1, 2, 4, 5 or 13	1 or 6	1 or 6	1 or 6
6" IP, MP & HP	1, 2 or 5	1, 2 or 5	1 or 6	1 or 6	1 or 6
8" LP	1, 2, 4, 5, 12 or 13	1, 2, 4, 5, 12 or 13	1 or 6	1 or 6	1 or 6
8" IP, MP & HP	1, 2 or 5	1, 2 or 5	1 or 6	1 or 6	1 or 6
10" LP	1, 2, 4, 12 or 13	1, 2, 4, 12 or 13	1 or 6	1 or 6	1 or 6
10" IP, MP & HP	1 or 2	1 or 2	1 or 6	1 or 6	1 or 6
12" LP	1, 2, 4, 12 or 13	1, 2, 4, 12 or 13	1 or 7	1 or 6	1 or 6
12" IP, MP & HP	1 or 2	1 or 2	1 or 6	1 or 6	1 or 6
16" LP	1, 2, 4, 12 or 13	1, 2, 4, 12 or 13	1 or 7	1 or 8	1 or 6
16" IP, MP & HP	1 or 2	1 or 2	1 or 6	1 or 6	1 or 6
20" LP	1 or 12	1 or 12	1 or 7	1 or 8	1 or 6
20" IP, MP & HP	1	1	1 or 6	1 or 6	1 or 6
24", 30" & 36" LP	1 or 12	1 or 12	1 or 7	1 or 8	1 or 6
24", 30" & 36" IP, MP & HP	1	1	1	1	1 or 6

Service Size

Main Size - Cast Iron

	≤ 2"	3"	4"	≥ 6"
4" LP	2, 4, 5 or 13	6 or 9	6	
4" IP & MP	2 or 5	6 or 10	6 or 10	
6" LP	2, 4, 5 or 13	6, 9 or 10	6 or 10	6 or 10
6" IP & MP	2 or 5	6 or 10	6 or 10	6 or 10
8" LP	2, 3, 4, 5, 12 or 13	6, 9 or 10	6, 10 or 11	6 or 10
8" IP & MP	2 or 5	6 or 10	6 or 10	6 or 10
10" LP	2, 3, 4, 12 or 13	6	6	6
10" IP & MP	2	6 or 10	6 or 10	6 or 10
12" LP	2, 3, 4, 12 or 13	7 or 10	6 or 10	6 or 10
12" IP & MP	2	6 or 10	6 or 10	6 or 10
16" LP	2, 3, 4, 12 or 13	6, 7 or 10	6, 8 or 10	6 or 10
16" IP & MP	2	6 or 10	6 or 10	6 or 10
18", 20", 24" & 30" LP	3 or 12	6, 7 or 10	6, 8 or 10	6 or 10
36" LP	3 or 12	6 or 7	6 or 8	6

Service to Main Connection

1) Weld a no blow tapping tee (Steel or Wrought Iron Mains Only)
2) Install insulated strap saddle and threaded no blow tapping tee. *Double strap for CI main and 10" and 12" ST mains. *Single strap for ST mains (other than 10" and 12").
3) Tap main and install plastic brass based tee (Preferred)
4) Drill main only and install insulated strap saddle and plastic brass based tee (Preferred)
5) Install clamp with takeoff (FPT) and threaded no blow tapping tee
6) Install "approved special order fitting" with appropriate welded fitting(s)
7) Tap main and install 3" service with riser tee
8) Tap main and install 4" service with riser tee
9) Install Style 80 with 3" threaded takeoff (FPT) and install 3" nipple (TOE) and riser tee
10) Install Style 50 and weld a no blow tapping tee
11) Install Style 80 with 4" threaded takeoff (FPT) and install 4" nipple (TOE) and riser tee
12) Tap main and install riser tee with nipple (PE) and insulok
13) Drill main only and install insulated strap saddle with nipple (TOE) and riser tee

Steel fittings must be properly insulated, coated and cathodically protected.

FPT - Female Pipe Thread
TOE - Threaded One End
PE - Plain End (no threads)

Note: If field conditions prohibit service/main connection specified above or for service/main combinations not listed, contact Gas Distribution Engineering for guidance and written confirmation.

APPENDIX G-3

Service Size

Main Size - Steel or Wrought Iron

	≤ 1"	1-1/2"	2"	3"	4"	≥ 6"
2" LP	1 or 2	1 or 2	1 or 2			
2" IP, MP & HP	1 or 2	1 or 2	1 or 2			
4" LP	1, 2, 6 or 7	1, 2, 3 or 7	1, 2, 3 or 7	1 or 8	1 or 8	
4" IP, MP & HP	1, 2 or 7	1, 2 or 7	1, 2 or 7	1 or 8	1 or 8	
6" LP	1, 2, 4, 5 or 7	1, 2, 4, 5 or 7	1, 2, 3 or 7	1 or 8	1 or 8	1 or 8
6" IP, MP & HP	1, 2 or 7	1, 2 or 7	1, 2 or 7	1 or 8	1 or 8	1 or 8
8" LP	1, 2, 5 or 7	1, 2, 5 or 7	1, 2, 5 or 7	1 or 8	1 or 8	1 or 8
8" IP, MP & HP	1, 2 or 7	1, 2 or 7	1, 2 or 7	1 or 8	1 or 8	1 or 8
10" LP	1, 2 or 5	1, 2 or 5	1, 2 or 5	1 or 8	1 or 8	1 or 8
10" IP, MP & HP	1 or 2	1 or 2	1 or 2	1 or 8	1 or 8	1 or 8
12" LP	1, 2 or 5	1, 2 or 5	1, 2 or 5	1 or 9	1 or 8	1 or 8
12" IP, MP & HP	1 or 2	1 or 2	1 or 2	1 or 8	1 or 8	1 or 8
16" LP	1, 2 or 5	1, 2 or 5	1, 2 or 5	1 or 9	1 or 10	1 or 8
16" IP, MP & HP	1 or 2	1 or 2	1 or 2	1 or 8	1 or 8	1 or 8
20" LP	1 or 5	1 or 5	1 or 5	1 or 9	1 or 10	1 or 8
20" IP, MP & HP	1	1	1	1 or 8	1 or 8	1 or 8
24", 30" & 36" LP	1 or 5	1 or 5	1 or 5	1 or 9	1 or 10	1 or 8
24", 30" & 36" IP, MP & HP	1	1	1	1	1	1

Service Size

Main Size - Cast Iron

	≤ 1-1/2"	≤ 2"	3"	4"	≥ 6"
4" LP	2, 4 or 7	2, 4 or 7	8, 11 or 12	8 or 12	
4" IP & MP	2 or 7	2 or 7	8 or 12	8 or 12	
6" LP	4, 7 or 14	3, 7 or 14	8, 11 or 12	8 or 12	8 or 12
6" IP & MP	2 or 7	2 or 7	8 or 12	8 or 12	8 or 12
8" LP	4, 7 or 14	3, 7 or 14	8, 11 or 12	8, 12 or 13	8 or 12
8" IP & MP	2 or 7	2 or 7	8 or 12	8 or 12	8 or 12
10" LP	2 or 5	2 or 5	8	8 or 12	8 or 12
10" IP & MP	2	2	8	8	8
12" LP	2 or 5	2 or 5	9 or 12	8 or 12	8 or 12
12" IP & MP	2	2	8 or 12	8 or 12	8 or 12
16" LP	2 or 5	2 or 5	9 or 12	10 or 12	8 or 12
16" IP & MP	2	2	8 or 12	8 or 12	8 or 12
18", 20", 24", 30" & 36" LP	5 or 12	5 or 12	9 or 12	10 or 12	8 or 12

Service to Main Connection

1) Weld a no blow tapping tee (Steel or Wrought Iron Mains Only)
2) Install insulated strap saddle and threaded no blow tapping tee. *Double strap for CI main and 10" and 12" ST mains. *Single strap for ST mains (other than 10" and 12").
3) Drill main only and install insulated strap saddle with nipple (TOE) and riser tee
4) Drill main only and install insulated strap saddle and service tee
5) Tap main and install riser tee with nipple (PE) and insulok
6) Tap main and install insulated strap saddle and service tee
7) Install clamp with takeoff (FPT) and threaded no blow tapping tee
8) Install "approved special order fitting" with appropriate welded fitting(s)
9) Tap main and install 3" service with riser tee
10) Tap main and install 4" service with riser tee
11) Install Style 80 with 3" threaded takeoff (FPT) and install 3" nipple (TOE) and riser tee
12) Install Style 50 and weld a no blow tapping tee
13) Install Style 80 with 4" threaded takeoff (FPT) and install 4" nipple (TOE) and riser tee
14) Drill main only and install insulated strap saddle and threaded no blow tapping tee

APPENDIX H-1

APPENDIX H-1

INSTALLATION REQUIREMENTS FOR THE PLASTIC BRASS-BASED TEE

THE PLASTIC BRASS–BASED TEE IS FOR LOW PRESSURE USE ONLY

	SERVICE SIZE		
MAIN MATERIAL / SIZE	1"	1 1/4"	2"
CAST IRON			
4"	CASE 2	CASE 2	CASE 2
6"	CASE 2	CASE 2	CASE 2
8" & LARGER	CASE 3	CASE 3	CASE 3
PROTECTED STEEL/ WROUGHT IRON			
4"	CASE 2	CASE 2	CASE 2
6"	CASE 2	CASE 2	CASE 2
8"	CASE 2	CASE 2	CASE 2
10"	CASE 2	CASE 2	CASE 2
12"	CASE 2	CASE 2	CASE 2
16"	CASE 2	CASE 2	CASE 2
LARGER THAN 16"	SEE NOTE 2	SEE NOTE 2	SEE NOTE 2
UNPROTECTED STEEL			
4"	CASE 1	CASE 1	CASE 1
6"	CASE 1	CASE 1	CASE 1
8"	CASE 1	CASE 1	CASE 1
10"	CASE 1	CASE 1	CASE 1
12"	CASE 1	CASE 1	CASE 1
16"	CASE 1	CASE 1	CASE 1
LARGER THAN 16"	SEE NOTE 2	SEE NOTE 2	SEE NOTE 2

FOR EACH NUMBER IN THIS CHART REFER TO THE CORRESPONDING CASE DRAWING IN APPENDIX H-2.

NOTES

1. IT IS ALWAYS ACCEPTABLE TO USE A STRAP SADDLE WITH A LARGER OUTLET AND CORRESPONDING PLASTIC BRASS–BASED TEE.
2. FOR STEEL MAINS GREATER THAN 16" IN DIAMETER, THERE ARE NO STRAP SADDLES AVAILABLE. IN THESE INSTANCES A PLASTIC BRASS–BASED TEE CANNOT BE USED.
3. A PLASTIC BRASS–BASED TEE SHALL NOT BE THREADED DIRECTLY INTO A STEEL OR WROUGHT IRON MAIN.

MATERIAL	CLASS/STOCK #
PLASTIC BRASS-BASED TEE	
1 ¼" BRASS INLET x 1 ¼" CTS OUTLET	341-4463
1 ¼" BRASS INLET x 1" CTS OUTLET	341-4471
1 ½" BRASS INLET x 1 ¼" CTS OUTLET	341-4588
1 ½" BRASS INLET x 1" CTS OUTLET	341-4513
2" BRASS INLET x 1" CTS OUTLET	341-4521
2" BRASS INLET x 1 ¼" CTS OUTLET	341-4505
2" BRASS INLET x 2" IPS OUTLET	341-4794
STRAP SADDLES	
4" CI x 1 ½" TAP	341-5098
4" CI x 1 ¼" TAP	341-5205
4" CI x 2" TAP	341-5221
4" ST x 1 ¼" TAP	341-5114
4" ST x 1 ½" TAP	341-5569
4" ST x 2" TAP	341-5122
6" CI x 1 ½" TAP	341-5072
6" CI x 1 ¼" TAP	341-5239
6" CI x 2" TAP	341-5254
6" ST x 1 ¼" TAP	341-5080
6" ST x 2" TAP	341-5130
8" CI or ST x 2" TAP	341-5189
10" CI or ST x 2" TAP	341-5155
12" CI or ST x 2" TAP	341-5148
16" CI OR ST x 2" TAP	CONTACT THE DEVELOPMENT LAB TO ORDER

PREPARED BY:	P.SMITH
REVIEWED BY:	B.DAS
APPROVED BY:	M.BALDOVIN
DATE:	5/29/07

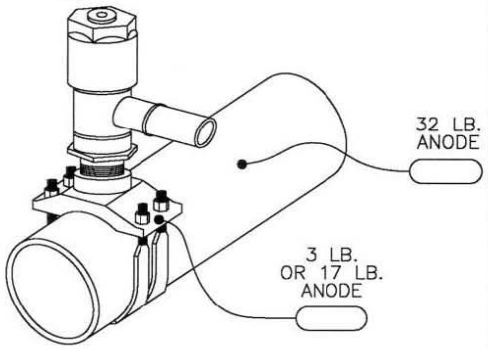
APPENDIX H-2

APPENDIX H-2

INSTALLATION REQUIREMENTS FOR THE PLASTIC BRASS-BASED TEE

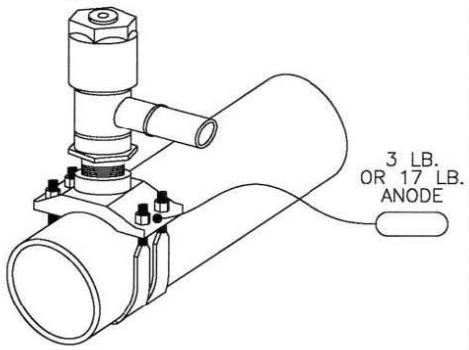
THE PLASTIC BRASS–BASED TEE IS FOR LOW PRESSURE USE ONLY

CASE (1)



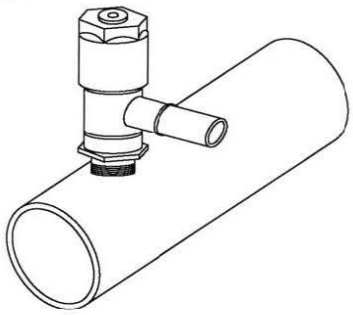
FOR UNPROTECTED STEEL MAINS, DRILL THE MAIN ONLY AND CONNECT THE BRASS–BASED TEE USING AN INSULATED STRAP SADDLE. ATTACH A 3 LB. MAGNESIUM ANODE TO 6" AND SMALLER STRAP SADDLES AND A 17 LB. MAGNESIUM ANODE TO 8" AND LARGER STRAP SADDLES. INSTALL A 32 LB. "HOT SPOT" MAGNESIUM ANODE TO THE PIPE.

CASE (2)



FOR PROTECTED STEEL, CAST IRON (6" AND SMALLER) OR WROUGHT IRON MAINS, DRILL THE MAIN ONLY AND CONNECT THE BRASS–BASED TEE USING AN INSULATED STRAP SADDLE. ATTACH A 3 LB. MAGNESIUM ANODE TO 6" AND SMALLER STRAP SADDLES AND A 17 LB. MAGNESIUM ANODE TO 8" AND LARGER STRAP SADDLES.

CASE (3)



FOR CAST IRON MAINS (8" AND LARGER), DRILL AND TAP THE MAIN AND CONNECT THE BRASS–BASED TEE DIRECTLY TO THE MAIN WITHOUT A STRAP SADDLE. NO ANODE IS NECESSARY.

PREPARED BY: P.SMITH
REVIEWED BY: B.DAS
APPROVED BY: M.BALDOVIN
DATE: 5/21/07

APPENDIX I

Appendix I Has Been Deleted

APPENDIX J

Excess Flow Valve (EFV) Installation Examples for Single and Branch Services

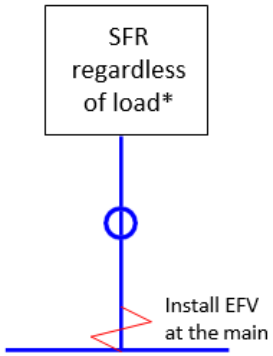
EFV Requirements:

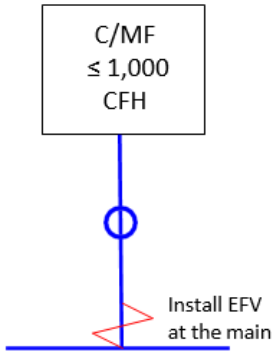
An EFV must be installed on each of the following high-pressure new or replaced services (including partial replacement from main to valve):

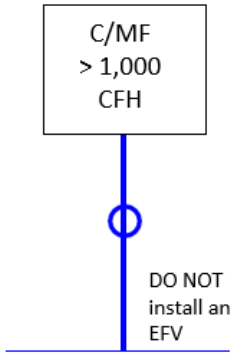
- Single-family residence (**SFR**) regardless of load.*
- Commercial and/or multi-family residence (**C/MF**) up to and including 1,000 CFH or equivalent obtained by adding the sum of all meter sizes on the service [i.e. (4) AL-250 meters =1,000].

Install EFV tag on the riser valve for an outside meter set and on the service head valve for an inside meter set. Document the EFV on the As-Constructed sketch.

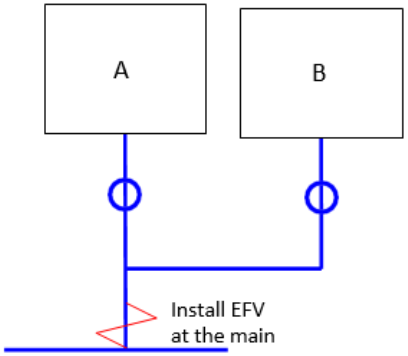
If an SFR is > 1,000 CFH, contact The Development Lab at (718) 579-1261 to obtain the proper EFV.







A + B ≤ 1,000 CFH
(Any service type)



A + B > 1,000 & neither is a C/MF > 1,000