

national**grid**

BLUEBOOK

SPECIFICATIONS AND REQUIREMENTS FOR GAS
INSTALLATIONS

UPSTATE NEW YORK

JUNE 2016

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Ensuring a Successful Gas Meter Set

- ✓ Gas Meter Header has been kept plumb and square
- ✓ Final grade has a minimum clearance of 6" to the bottom of the meter
- ✓ Gas regulator vent maintains 18" minimum height from grade
- ✓ Gas regulator vent meets 18" clearance requirements from windows, doors, other openings into the building
- ✓ Gas regulator vent maintains a minimum of 10' from any mechanical air intakes
- ✓ Gas regulator vent terminus maintains 3' from any source of ignition
- ✓ Gas regulator vent and meter header maintains a minimum of 12" horizontally from any electric meter pans or electric meters
- ✓ Electric meters meet clearance requirements and are not installed directly above the gas regulator or meter header
- ✓ Electric meter has been installed and the dwelling is powered up
- ✓ Customer owned piping has been sleeved or properly cold wrapped for protection if going through a masonry wall
- ✓ Multiple meter header has been properly secured to the wall
- ✓ Multiple meter headers have had ID tags installed identifying the units locations
- ✓ Protection posts shall be installed to code if required to prevent vehicular damage
- ✓ Make up air requirements meet combustion needs
- ✓ City, State, Town, or Village pressure test certificate has been left on site for National Grid if required by the authority having jurisdiction before meter can be set
- ✓ All customer owned piping is installed to National Grids Blue Book requirements, and meets City, State, Local, IFGC code. All CSST products must meet manufacturer's bonding requirements.
Check with the authority having jurisdiction to verify the code they are following
- ✓ National Grid has access to the dwelling to install meter and fire one piece of equipment to obtain Lock Up and Running Pressures

GAS METER SET APPOINTMENT CONTACT NUMBER

(800) 460-0054



IMPORTANT NOTICE

REGARDING

NATIONAL GRID SPECIFICATIONS AND REQUIREMENTS FOR GAS INSTALLATIONS

These Specifications and Requirements have been designed with great care so that, when followed consistently, they will ensure that a new installation will comply with New York State law, various codes and other safety requirements. Failure to comply may result in a code or safety *violation* and/or a job not being approved. Therefore, delays could result while the contractor corrects the changes at his/her expense.

The specifications, construction standards and other requirements contained in this book represent National Grid commitment to the contracting community for quality and consistency of service. Any variation from the type of hardware used, connection point of service, service entrance or other details on a construction standard must be approved in advance by National Grid in writing.

We at National Grid are always available to discuss your design concerns and to provide assistance to you. We encourage any questions regarding your problems on specific projects, please be sure to contact us for our input during the *planning* stages to avoid possible additional costs later in the job.

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Gas Meter Installation Checklist

The Following checklist is in accordance with the requirements of the New York State Fuel Code and National Grid Installation standards.

Before you request installation or unlock of the gas meter, the gas service, regulator and meter bar must be installed, with the trench backfilled to structure.

When Calling for a gas meter installation, please ensure the following:

- ☐ National Grid Gas Service Personnel have access to the inside of the building to perform inspection.
- ☐ You know your dwelling's total BTU Load so the gas meter can be properly sized.
- ☐ Electric Service has been, or will be, energized prior to the gas meter installation.

Venting:

- ☐ All Flues are rigid, tight, and cemented at the point of entry to masonry chimneys.
- ☐ All Single-wall vent pipes have a clearance of six inches from combustible material.
- ☐ Double wall piping (Type B) has been used when installed along the outside wall of the structure (for most commercial establishments) and has a clearance of one inch from any combustible material.
- ☐ The Gas appliance vent enters the chimney above the oil appliance vent, if both share vent.
- ☐ Heating equipment has been installed in clay tile chimneys or approved metal chimney systems.
- ☐ In case of oil to gas conversions, the chimney - has been cleaned. If the chimney is not lined, a flue liner has been installed. Proof of chimney inspection and cleaning certificate is required
- ☐ Gas appliances are not vented with wood burning appliances
- ☐ A minimum of one gas appliance installed and ready to operate

Fuel Lines

- ☐ All lines have doped fittings and are supported or strapped every six feet.
- ☐ Water heaters, boilers and furnaces have drip legs, and flexible pipe connectors have not been used.
- ☐ Every appliance has a separate, easily accessible shut-off valve within six feet of the appliance and in the same room as the appliance
- ☐ The shut-off valve for a gas range is located within the same room as the appliance.
- ☐ All fuel line unions are located on the appliance side of shut-off valves.
- ☐ Fuel lines have been connected to the meter bar.
- ☐ On multiple-metered installations, the Meter bars have been permanently marked with corresponding unit/apartment numbers.
- ☐ The units/apartments have been clearly marked.
- ☐ Fuel lines have been air tested for leaks.
- ☐ Fuel lines must be sleeved when penetrating any exterior wall or any interior masonry walls.
- ☐ Flexible gas fuel lines have been installed within manufacturer and NYS fuel code specifications using approved pipe fittings and adaptors. Exterior wall penetration to the outside meter bar has been made with black iron pipe. Bonding should be applied in accordance with section 310 of the NYS Fuel Code.

Appliance Installations:

- ☐ All appliances have been installed in accordance with manufacturer and NYS Fuel Code specifications. These appliances have been made accessible.
- ☐ A utility room or closet containing a gas dryer has a fully louvered door or one-inch space above the finished floor.
- ☐ Vented appliances have not been installed in a closed room (e.g. bedroom, bathroom), unless they draw fresh air from outside the sealed room.
- ☐ The burner portion of any appliance installed in a garage is at least 18 inches above the floor, unless the unit is manufacturer and NYS Fuel Code approved for direct floor installation.
- ☐ The appliance is protected from vehicular or physical damage with the installation of bollards or posts imbedded into the concrete floor.
- ☐ All utility rooms that have a boiler, furnace or water have provisions for makeup air in accordance with NYS Fuel code.
- ☐ Where roof access is over 14 feet, permanent stairs or hatchways in the interior of the building have been provided to ensure access to heating systems installed on rooftops.

1.0 INTRODUCTION

1.1 PURPOSE

This book presents specifications and requirements relating to the connection and use of natural gas supplied from the National Grid Gas System. It contains the minimum acceptable standards for gas piping and gas appliance installation necessary to ensure the safe and satisfactory utilization of natural gas by our customers. The information contained herein is intended primarily to assist the installer in the new gas installation process, but it is also intended for use by our customers, by architects and engineers, and finally, by people in various departments at National Grid. It shall be used when a customer's gas installation is new, when a customer is increasing gas usage from a smaller capacity, or when any changes are made from the original installation. It represents a collection of information which will provide for a safe, properly conceived, accurately sized and cost effective installation that will give long lasting, satisfactory service to our customers.

1.2 SCOPE/REFERENCES

The contents of this book apply to installations connecting gas supply system to a customer's premises. We have made it as comprehensive as is practical, within the limits of the intended overview of the subject matter it addresses. The intent of the book is to provide a framework for the subject, not a collection of specific information from various sources. Generally, it refers to several primary documents which form its basis:

- a. The National Fuel Gas Code (NFPA 54/ANSI Z223.1), latest revision, referred to in the book as NFPA 54.
(COVERS CUSTOMER OWNED PIPING AFTER THE GAS METER)
- b. The New York State Codes, Rules and Regulations Title 19 (16 NYCRR 255 and 261), latest revision, referred to in the book as *NYCRR*.
(COVERS UTILITY OWNED PIPING BEFORE THE GAS METER)
- c. Fuel Gas Code of New York State (FGCNYS)
(COVERS CUSTOMER OWNED PIPING AFTER THE GAS METER IN NEW YORK STATE)
- d. Manual of Planning Standards for School Buildings (NYS Board of Regents)
(COVERS ALL NY STATE SCHOOLS K through 12th Grade)
- e. International Fuel Gas Code
(COVERS CUSTOMER OWNED PIPING AFTER THE GAS METER)

It is important to note here that some **Upstate New York**, towns, villages, counties, etc., frequently have codes to which the owner or his/her plumbing contractor is expected to adhere. It is *the owner's or installer's responsibility* to become aware of the requirements of the area in which the installation is to take place.

1.3 EXCLUSIONS; RETROACTIVITY

Unless otherwise stated, the provisions of this book shall not be applied **retroactively** to existing installations and/or systems that were in compliance with the Rules and Regulations/Specifications and Requirements in effect at the time of installation. In cases where modifications are being made, those modifications shall be installed to conform to the specifications and requirements of this book.

1.4 ALTERNATE MATERIALS, EQUIPMENT AND PROCEDURES

If the contents of this book are not applicable to the equipment to be installed, or if an alternate installation method or alternate usage of material is being considered that is not covered in this book, National Grid shall be contacted for definition or clarification before proceeding with the installation. Sufficient technical documentation, such as a manufacturer's written instruction, must be submitted to substantiate any claims made regarding the safety of such alternatives.

1.5 RESPONSIBILITY

Pursuant to Gas Tariff's, notwithstanding any inspection by National Grid of a customer's equipment or equipment installation or any failure by National Grid to reject an equipment installation, National Grid does not provide any warranty, expressed or implied, as to the adequacy, safety or other characteristics of any structures, equipment, wires, pipes appliances or devices owned, installed or maintained by the customer or leased by the customer from third parties.

2.0 DEFINITION OF TERMS

The following definitions of terms used in this book have been assembled from various sources, and have been edited to be meaningful for use in this context and in the gas utility business.

Accessory: A device or material used to conduct gas or used in conjunction with an "appliance". In this book, some examples of accessories are valves, thermostats, appliance connectors, pressure regulators, draft hoods and interior house piping.

AGA: American Gas Association; an organization made up of most American gas utilities, producers and transporters, which sets standards and disseminates information throughout the gas industry in the interest of bettering industry practices and advancing safety.

Appliance: A self-contained device, such as a range or boiler, that converts energy into heat or other useful purpose. In this book, appliance usually relates to furnaces, boilers or water heaters.

Applicant: A potential customer.

Booster: A centrifugal blower selected to increase gas pressure when the pressure in the gas main at the customer's location is insufficient for a customer's requirements. Boosters are usually required only in industrial or commercial applications. A booster is a machine that is designed to operate on a flat pressure vs. flow curve, which enables it to provide variable flow

at an essentially constant pressure. Boosters for natural gas service normally are selected to increase pressure to no more than 28" of water column (W.C.), and are normally furnished hermetically sealed.

BTU, Btu: Abbreviation for British Thermal Unit. A Btu is a unit of energy defined as the amount of heat required to raise one pound of water one degree on the Fahrenheit scale, normally from 60 degrees F to 61 degrees F.

BTUH, Btuh: Abbreviation for British Thermal Units per hour. Also expressed as **Btu/Hr.** A standard measure of energy input and output. Typically used in the gas utility industry as a measure of the total, or capacity, of a gas appliance, such as a boiler or a furnace.

Building: A structure that stands alone or is separated from adjoining structures by fire walls with all openings therein protected by approved **fire** doors. In certain applications, a **party** wall may be required instead of a fire wall.

CFH, cfh: Abbreviation for cubic feet per hour. A standard measure of gas flow. Generally understood to mean, and often used interchangeably with, **SCFH** or **Scfh**, or standard cubic feet per hour, meaning gas measured at "standard conditions", or 60 degrees Fahrenheit and atmospheric pressure (14.7 psia or 30" mercury absolute). Typically used in the gas utility industry to express gas flow to a customer's premises and through the customer's piping. For gas flowing at the pressures generally used in a customer's premises (about 6" W.C.), flows **expressed in cfh can be assumed**, for use in calculations such as determining pressure drop in piping and valves, **to mean scfh**, with a negligible margin of error. (This assumption is not valid for metering and billing calculations where the pressures are corrected back to 7" W. C., or 0.25 pounds per square inch [PSIG].)

Company – National Grid

Connection Point of Service: That point in the gas service line where responsibility ends and the customer's responsibility begins; or that point where gas service **piping** ends and customer-owned piping begins. Also known as Connection Point, Connection Point of Gas Service, National Grid/Customer Connection Point of Gas Service, Point of Delivery, Point of Service and Customer Interface. The Connection Point of Service may be located physically at different points in the piping, depending on the meter header configuration used, as defined on Construction Standards.

Construction Standard: A technical instruction, usually a drawing, but often including diagrams and tables, prepared and agreed to within **National Grid** as a standard method of performing a task, and used for the installation of gas facilities. Contact Customer Fulfillment for a copy of the latest job specific Construction Standard.

Contractor: A **licensed / qualified** installer of gas utilization equipment and associated piping, ductwork and controls.

Conversion, Gas Conversion: An installation where an appliance originally designed for use with a fuel other than natural gas has been modified to use natural gas, without extensive modifications to the original appliance. A typical gas conversion modifies only the burner of the appliance.

CSA - CSA International - an organization that tests equipment and accessories to insure it is suitable for use in a specific manner or certified to be listed to a specific Standard.

Customer: A user of gas. A customer may be a person, firm, partnership, corporation, association, developer, builder, or governmental agency to whom gas is supplied and billed by National Grid. All National Grid customers are provided, emergency assistance at no charge, covering generic concerns relating to the meter, the gas service, gas odor reports, low or high gas pressure, gas service outages, and other unusual conditions relating to the gas supply.

Residential Customer: A customer supplied by National Grid with gas service at premises used as his/her residence, or a landlord's residence, through a separate meter.

Commercial Customer: A customer supplied by National Grid with gas service at his/her business premises through a separate meter.

Multiple Dwelling Customer: A customer supplied by National Grid with gas service at premises used as his/her residence, but in a multiple dwelling building, normally through a separate meter, but sometimes through a common meter as conditions warrant.

Interruptible Customer: A customer supplied by National Grid with gas service at his/her business premises through a separate meter, that may be interrupted at critical times as agreed to by the contract with National Grid. These customers **shall** have the capability of burning a second fuel, when the gas service is interrupted.

Temperature Controlled Customer: A customer supplied by National Grid with gas service at his/her business premises through a separate meter, that will be interrupted at an annually pre defined temperature as agreed to by the contract with National Grid. These customers should have the capability of burning a second fuel, when the gas service is interrupted.

Transportation Customer: Residential or commercial customers who purchase natural gas directly from a gas supplier, rather than from a utility. The customer contracts with a gas broker, who arranges monthly with a supplier, a gas pipeline company and National Grid to have quantities of gas transported directly to him/her (the customer). Transportation customers are billed both by the gas broker and by National Grid. The broker's bill reflects the commodity cost, the transportation cost (interstate pipeline) and the broker's commission.

Customer Owned Piping: Is defined as all piping above ground and below ground installed after the meter. It is the customer's responsibility to install, test, maintain and keep records of this piping.

Dekatherm: A therm multiplied by 10 (10 therms). A commonly used quantity of gas used for billing purposes. Also see **therm**.

Elevated Pressure Gas supplied to a customer's equipment at pressures greater than 7" W.C. (0.25 PSIG).

Easement: Right to pass over, occupy or use another's land for the placement and access of company service facilities.

Fire Wall: Similar to a Party Wall in construction, is generally an *internal* wall. However, openings, between adjoining areas, such as fire doors, or extensions of facilities, are permitted in firewalls. Both party walls and firewalls may have different construction requirements and/or different fire ratings, depending on the type of building. Consult state and local codes for further clarifications.

Gas Distribution System, Low Pressure: A gas distribution piping system in which the pressure is substantially the same as the standard pressure delivered to the customer and where service regulators are not installed.

Gas Distribution System, High Pressure: A gas distribution piping system in which the pressure is nominally higher than the standard pressure delivered to the customer and therefore requires a service regulator. Gas distribution system may furnish gas to the customer's service location at several different pressures, depending on the geographical area served.

Gas Mains. Pipelines owned by National Grid, which are used to transport gas, in accordance with National Grid's tariff.

Gas Service, Gas Service Line: A distribution line that transports gas from a common source of supply to an individual customer, to two adjacent or adjoining residential or small commercial customers, or to multiple residential or small commercial customers served through a meter header or manifold. A service line ends at the outlet of the customer meter or at the connection to a customer's piping, whichever is further downstream, or at the connection to customer piping if there is no meter.

Gas Technical Lead: The National Grid person from the Customer Fulfillment or C.M.S. (Customer Meter Services) who is the technical contact for the customer when a new installation or a conversion is undertaken.

Installer: See Contractor.

Labeling: "appliances shall be listed and labeled" UL and AHRI (American Heating and Refrigeration Institute) created to recognize code-prescribed and alternative materials.

Law, Federal: Federal Dept. of Transportation (Office of Pipeline Safety) Title 49, Part 192.

Law, New York State: New York State Codes, Rules and Regulations, Title 16, Part 255

Listed: Equipment or material included in a list published by an organization acceptable to National Grid, such as Underwriters Laboratories (UL), and concerned with product evaluation that maintains periodic inspection and evaluation of the production of listed equipment or materials. A typical listing states that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

Low Pressure Service: Gas supplied to a customer from a low pressure gas main.

Mechanical Stab Type Connector: A pull out resistant coupling or cap with a steel insert matched to the wall thickness of the tubing and an “O” ring seal that seals on the outside of the tubing.

Meter: The instrument used to measure and indicate and/or record the volume of gas that has been delivered to a customer.

Meter Bar: A specialized item of hardware that functions as a connecting device between the gas service line and the gas meter.

Meter Set: The term used to describe the meter and its related piping and equipment. Often synonymous with ***meter header, meter installation.***

Meter Header: The piping and equipment installed at a customer location relating to and in support of the meter.

Multiple-Family Building: A structure, including row houses, enclosed within exterior walls or fire walls, built, erected and framed of component structural parts, and designed to contain two or more individual dwelling units for permanent residential occupancy.

Multiple Services to a Building: Only one service will normally be permitted to a building, unless authorized and approved by National Grid. A separate building shall consist of either a detached, separate structure, or an attached structure separated from the first structure by a party wall.

Nominal: The standard pressure at which National Grid furnishes gas to customers. Nominal pressure depends on the pressure of gas main at a given installation. When served from a high pressure main, nominal pressure at the outlet of the regulator is 6"- 7" water column (WC). When served from a low pressure main, nominal pressure can vary from 4.0" to 9.5" WC column. Nominal pressure is taken to be the pressure measured at the connection point of service. See Section 6.0 of this book for more information.

Party Wall: As defined in the New York State Uniform Fire Prevention and Building Code a party wall shall contain no openings therein. A party wall shall be continuous from the lowest floor level of the building through the roof membrane, and shall terminate in a two foot parapet (except where properly sealed at the roof level). Party walls shall bear the proper fire rating as per the NY State Code, and shall be smoke tight at the exterior walls. They shall also be capable of supporting either side of the roof assembly in the event of a collapse.

Pressure Test. Each gas line shall be tested with a calibrated gauge using air, water, or inert gas. The test Pressure and Duration can be found on the last page of this packet.

Regulator: A device used to reduce the pressure of gas from a higher pressure at its inlet to a lower pressure at its outlet, maintaining that pressure essentially constant, while also controlling the flow of gas; usually mounted directly in gas piping.

Regulator (Customer Owned): A regulator provided by the customer (see definition above) used on elevated pressure installations (pressures greater than the nominal 6" W.C.), that is mounted in the house line between the service regulator and the appliance regulator, and reduces gas pressure from that elevated pressure to the typical nominal houseline pressure of 6" W.C. This regulator must provide a bubble tight (dead end lock-up) with full relief capacity.

Regulator (Company Owned): A regulator that reduces and controls gas main pressure to the pressure of the customer's house line. Usually set by National Grid to supply gas at 6" WC. This regulator is furnished, installed and maintained by National Grid.

Regulator, Appliance: A regulator (see definition above) mounted at the appliance, (normally furnished with the appliance) that reduces the house line pressure to the pressure utilized by the appliance.

Security Valve: A control valve, installed on a meter header, usually for a large load, that is set to close automatically upon sensing one or more gas parameters, usually high and low pressure. A meter header using a security valve is normally designed by National Grid.

Sediment Trap: “a tee fitting with a capped nipple in the bottom opening of the run of the tee or other device approved as an effective sediment trap – to collect solid foreign particles to prevent such material from entering close-fitting parts or small passageways (e.g., valves and orifices)

Service Line: New York State Rules and Regulations-Title 16, Part 230.1 (b) defines a service line as: “any underground piping, including associated metering and pressure reducing appurtenances, that transports gas below grade from a main to the first accessible fitting inside the wall of a customers building, when a meter is located within the building; if a meter is located outside the building, the service line will be deemed to terminate at the outside of the building foundation wall.”

Service Riser: (Sweep) That portion of gas service line where the piping comes out of the ground.

Tariff: The regulated rates, charges and responsibilities that are defined by the New York State Public Service Commission, which constitute the company's rate base, and upon which National Grid must operate and adhere to as a regulated utility.

Therm: A unit of heating value equivalent to 100,000 BTUs. Gas is normally billed by the therm, or by the **decatherm**, which is a therm multiplied by 10 (or 10 therms). A cubic foot of gas is generally equal to 1,000 - 1,060 BTUs as supplied by National Grid .

UL: - Underwriters Laboratory - an organization that tests equipment and accessories to insure it is suitable for use in a specific manner or certified to be listed to a specific Standard.

URD: Underground Residential Distribution. A National Grid term used to describe a new building project for residential developments of five or more dwelling units where all the utilities are furnished underground in a common trench. Extensive coordination is required within National Grid regarding the electric and gas installations to the development, as well as coordination outside with other utilities, such as telephone and cable television.

Warning Tag; Warning Tag Procedure: A New York State mandated set of detailed safety warning criteria in which gas utilities are required to provide notice to customers upon discovery of potentially unsafe gas piping and appliances. National Grid executes this mandate via a Warning Tag procedure, which serves notice of a problem to customers by leaving a warning tag at the premises. A warning tag is issued when a condition is identified in which a gas appliance or gas piping are deemed to present a hazard to life or property if

allowed to operate in the condition found. Conditions requiring the issuance of warning tags fall into three classes:

- Class A: Those conditions that present an immediate hazard and require the gas to be shut off and locked at the meter or effectively isolated in some other manner. A Class A warning tag is generally found to be associated with leaking gas piping, or carbon monoxide.
- Class B: Those conditions that present an immediate hazard and require the gas to be shut off, but not locked at the meter, unless the hazard cannot be isolated from the rest of the gas system. Class B warning tags are generally found to be applicable to unsafely installed appliances or related equipment.
- Class C: Those conditions that do not present an immediate hazard, but if not corrected may become hazardous. The gas will be left on. A Class C warning tag can be issued for a variety of reasons, most often related to appliances.

W.C., w.c.: Water column; the standard scale of measurement, expressed in *inches of water column*, used in the natural gas industry to measure gas pressure. The units of inches of water column (W.C.) are commonly used for pressures below **1 psig**. 1 psig = 27.8" W.C. Gas customers are typically furnished natural gas at a pressure of 6" W. C. which is about 1/4 *psig*.

3.0 **GENERAL**

3.1 **AREA/GEOGRAPHICAL CONSIDERATIONS**

The working area of National Grid Gas Business Unit **in Upstate** geographically encompasses the Eastern and Central territories. Therefore, in order to ensure that all installations utilizing National Grid supplied gas are consistent in their usage, while also in compliance with regulations in these different geographic areas, this book has been designed to apply generically to all of these areas. Where it is appropriate, it addresses needs by specific geographic location. It is the customer/plumbing contractor's responsibility to become familiar with the specific requirements of the area of the installation. The reader is strongly encouraged to check with the village, town, city and county governments applicable to his/her installation, to determine if regulation changes have been made, or to determine if any new regulations have been enacted, since the creation of this document.

NOTE

The knowledge of the existence or absence of regulations within a given jurisdiction is the responsibility of the contractor.

3.2 **COMMUNICATION / COOPERATION RDW**

It is our goal at National Grid to ensure that all of our customers experience safe, trouble-free and dependable gas service. Achievement of this goal begins early in the process of any gas installation. We believe that this can best be accomplished through close cooperation and communication with our customers and their contractors, to assure a quality job, during all phases of the planning and installation of a gas service. ***Therefore,***

it is vital that both customer and contractor provide us with preliminary information as early as is feasible in the development of plans for the installation of a new gas service or an increase in gas load. With this information we can ensure that the scheduling of our construction work, meter installation and other service work is appropriate. It will also provide us with an early opportunity to advise customers and contractors if any unique job characteristics exist concerning gas equipment and metering facilities. This kind of communication and cooperation, along with careful adherence to the instructions and specifications in this book, is crucial in preventing delays at any point in a job, and avoids problems that may be difficult to correct later on. We believe that this is the most effective way to ensure complete customer satisfaction with our gas service.

3.3 MEANING OF "SHALL" IN THIS BOOK

When used in this book, the word **shall** is to be understood to mean that the contractor/customer must comply with the specification, action or physical requirement described. Failure to comply will result in refusal to provide a meter or connect to our gas system. The meaning of the term **must** is considered to be the equivalent of the term **shall** in this book.

3.4 STATE AND LOCAL CODES

The specifications and requirements in this book are intended to supplement any State, City, Town or Village code or ordinance. If a conflict exists between a National Grid requirement and a local code requirement, the more stringent shall apply. ***It is the Contractor's responsibility to be aware of the code requirements for the area of his/her installation. National Grid does not assume the obligation of enforcing local code requirements.***

3.6 INSPECTIONS, CERTIFICATES, PERMITS

If the local jurisdiction where an installation is being planned requires an inspection, a certificate or a permit, it is ***the owner/contractor's responsibility*** to make the appropriate arrangements.

3.7 ACCESS TO CUSTOMERS' PREMISES

National Grid reserves the right to enter customer property between the hours of 8 AM and 6 PM for the purpose of installing, removing or maintaining our assets/equipment. This shall include items such as buried service lines and valves, exposed service lines and valves, gas meters, gas regulators, or gas regulator vents.

3.8 IDENTIFICATION OF EMPLOYEES

Every National Grid employee, or their designee acting on behalf of the Company, who is authorized to enter the customer's premises for the purpose of reading or testing meters, investigating odor complaints, or for other purposes, is supplied with an identification card bearing his/her photograph. Employees must, upon request, show their identification cards. If anyone claims to represent the Company and fails to display an identification card upon request, the customer is advised to deny admittance to that individual and to notify both National Grid and the police.

3.9 UNAUTHORIZED CONNECTIONS

National Grid or designee shall have the sole right to make all gas service connections to its gas distribution system.

3.10 SEALS AND TAMPERING DEVICES

No person, except a duly authorized National Grid employee/contractor shall be permitted to break or replace a seal or lock, to alter or change a gas meter or its connections or location, open or alter a meter by-pass valve, or to alter a gas pressure regulator setting.

3.11 DISCONNECTION OF SERVICE

National Grid possesses the sole right to disconnect, remove or reset gas services and/or meters, and to admit gas to any new system of piping or to any old system of piping from which the use of gas has been temporarily discontinued. When installers find it necessary to disconnect a meter or to temporarily shut off the gas, they are required to contact National Grid to arrange scheduling.

3.12 REACTIVATING GAS SERVICE FOLLOWING A WARNING TAG VIOLATION

3.12.1 When National Grid issues a Warning Tag to the customer that involves shutting off the gas supply to an individual appliance and/or a particular section of gas piping due to a hazardous condition, service does not need to be restored by National Grid. Once repaired, gas service may be restored to the affected appliance and/or piping by a licensed qualified contractor.

3.12.2 When National Grid issues a Warning Tag that involves the gas supply being shut-off and locked at the meter, the contractor or customer shall notify National Grid that the hazardous condition has been corrected and request that National Grid turn on the gas supply.

3.13 NATIONAL GRID EQUIPMENT ON PRIVATE PROPERTY

All National Grid equipment located on the customer's premises, such as the gas service line, meter, regulators, meter piping, etc., remain National Grid property, and may be removed by National Grid in the event such equipment is no longer needed.

3.14 DEMOLITION

Prior to any demolition of any existing building where gas and/or electric service is installed, the gas and electric must be shut off and the gas service lateral cut by National Grid at the property line. No building demolition shall be started until gas meters and regulators have been removed and the gas service has been retired (physically disconnected) by National Grid. Please contact 1-800-260-0054.

3.15 INTERCONNECTIONS

3.15.1 When a supplementary fuel supply for stand-by use is connected downstream of a gas meter, an adequate, full-port, three-way valve shall be installed between the meter and the stand-by fuel piping connection. The stand-by fuel piping and the

natural gas piping downstream of the three-way valve shall be equipped with shut-off valves. Three-way valves of the type that completely close one port before starting to open the other port shall be used. The three-way valve shall be suitable for use in natural gas service and the supplementary fuel supply used at the site where it is installed.

3.16 BACK-PRESSURE, AND SUCTION PROTECTION

3.16.1 When the nature of a customer's equipment utilization may induce back-pressure or suction in the piping system carrying gas (such as a gas booster), suitable protection devices shall be installed and maintained by the customer. The contractor is referred to Sections 5.10 of NFPA 54 and Section 414 of the FGCNY. National Grid's Customer Fulfillment organization should be contacted when this application is to be used.

3.17 PROTECTION WHEN COMPRESSED AIR OR OXYGEN CAN ENTER GAS PIPING (Including torches, jewelry torches)

3.17.1 Protection is required whenever an installation uses compressed air or oxygen that might accidentally, or for other reasons, cause air or oxygen to enter the gas piping. The contractor is referred to Sections 7.12 of NFPA 54 and Section 414 of the FGCNY. Protection devices, such as flame arrestors and check valves shall be installed and maintained by the customer. National Grid shall be contacted when this application is to be used.

3.18 ADEQUACY AND SAFETY

3.18.1 National Grid reserves the right to withhold or discontinue its service, whenever an installation is deemed by the Company to be unsafe, inadequate or unsuitable for receiving gas service or interferes with the continuity or quality of our service to our customers.

3.19 CODE COMPLIANCE

3.19.1 Gas appliances and gas piping installations on the customer's premises shall be installed in compliance with the minimum safety requirements of these standards and the National Fuel Gas Code. These provisions shall be applicable to new installations and to modifications of existing appliances or systems. Any appliance or system found to be in non-compliance with National Grid standards or other applicable codes shall be subject to the provisions of the Company's Warning Tag Procedure. (see Definitions, Section 2.0)

3.20 REVISIONS OF THIS BOOK

3.20.1 The information in this book will be periodically revised, updated or amended **on-line only** as required by industry developments to protect the mutual interest of the customer and National Grid.

4.0 NEW GAS SERVICE INSTALLATION PROCESS

4.1 GENERAL

- 4.1.1 To initiate a new gas installation or to request an upgrade or relocation of your existing gas service please contact **1-800-260-0054**.
- 4.1.2 A logical progression of events and requirements for having a new gas service installation is provided in Section 4.2. It is important for contractors and customers to become familiar with this material in order to determine how a new gas service installation or a conversion progresses through the National Grid system.
- 4.1.3 For any new installation, the customer or his/her contractor shall provide National Grid with the Btu load requirement and identify all gas equipment and required operating gas pressures.
- Gas pressure required at service termination point,
 - New, existing and future projected loads.

Information provided to National Grid by the customer or his/her contractor regarding a proposed gas installation or an increase in load shall be required in writing.

- 4.1.4 The applicant or customer shall furnish at the premises, at his/her expense, appropriate piping and equipment for gas utilization purposes. Piping shall comply with requirements in Section 5.0, 7.0 and 8.0 of this book. Gas utilization equipment shall comply with Section 9.0 of this book.
- 4.1.5 Customers already using gas service from National Grid shall advise the company of any addition or substantial change in his/her equipment, such as increasing a boiler size to accommodate a new building wing or adding a swimming pool heater, or generator, **prior to** making such additions or changes. Prior to purchasing any new equipment requiring greater than standard pressure needs to be reviewed by National Grid. All requests for an increase in service capacity, please contact 1-800-460-0054.
- 4.1.6 For all customer owned installations, the customer shall be expected to provide, at his/her expense, any and all permits or certificates (except street excavation permits) usually issued by public agencies, that are associated with piping and appurtenances downstream of the meter, as part of the requirements in furnishing gas service. Any easements required for the job shall also be provided by the customer at his/her expense. Plumbing permits shall be obtained by the plumbing contractor. Customer is responsible to mark out all customers owned buried facilities on private property in vicinity of the proposed gas service, please contact 811.
- 4.1.7 National Grid shall not be obligated to begin construction on the gas service or to supply gas to the customer until:

- The applicant furnishes all necessary permits to National Grid, and easements and/or rights of way are granted;
 - The customer's application has been approved by proper officers or duly authorized representatives of the company;
 - Necessary payments are made by the applicant;
- 4.1.8 When National Grid deems appropriate, meetings will be held as required. At these meetings, the design and construction process will be discussed. The meetings will be arranged so that the various contractors and any other relevant representatives will be able to attend.
- 4.1.9 The Appendices contains specific information relative to gas service/equipment installations. This information is valuable for any installation in terms of understanding construction policies and standards.
- 4.1.10 After all of National Grid's preconstruction activities and requirements have been completed and approved, the Company's installation crew will meet on the mutually accepted or agreed require by date.

All orders for main and service installations will be field-checked by National Grid after receipt of the authorized Work Order, if required. For sites where the gas meter will be located indoors, National Grid will not release a job until the inside meter location has been inspected for required clearances and accessibility.

National Grid shall apply for road opening permits before excavating in the roadway. National Grid will not install or excavate without receiving the proper permits from the municipality or town where the installation is located. The time required for issuance of permits will vary according to the municipality, i.e., town, city, county, state, village having jurisdiction. National Grid will not be responsible for delays incurred in the permit process due to internal municipality delays.

CAUTION!
CALL 811!
BEFORE YOU DIG!

*All excavators shall be familiar with 16 NYCRR Part 753, "Protection of Underground Facilities". Contractors are advised to exercise extreme caution when breaking ground. Before you dig, drill or excavate, be sure that your work area is clear of buried gas pipes or electric cables. An accidental break of these facilities can be dangerous! Telephone the One Call Center at least **(3) three working days** before you start work. The location of any existing electric buried cable or National Grid buried pipe will be marked along with telephone, water and cable.. The utility will not mark customer-owned buried facilities on private property. Contractors shall not begin any excavation work until all call-backs are made from utility operators contacted as a result of the One Call Center telephone call. If facilities are not marked **DO NOT ASSUME** that there are not facilities*

present in the area. Note that the customer and/or contractor are responsible for marking facilities on private property. If sub-contractors are hired, please remind them that they are obligated to call the One Call Center before they do any excavating work

In areas where property lines have not been established, or where curbs are not installed, the customer or contractor shall provide National Grid with accurate information as to buried items, such as underground mains and services, drainage, sewers, oil tanks, cesspools, etc. Before National Grid begins work on a main or service, curbs shall be installed, where applicable. Property lines and grades are especially important in developments where roads are cut to a rough-grade that may be as much as 3 feet below or above sub-grade. Determination of sub-grade facilities and their locations are very important as our mains and service installation depends on accurate fixed points to decide proper depth of a trench. National Grid will only begin work where it has been validated that the existing grade is within 6" of final grade.

NEW GAS MAIN INSTALLATIONS REQUIREMENTS

Before the installation of any new gas main, on privately owned streets, the customer shall have the construction area free of any violations. In order, for National Grid construction activities to take place, the following requirements shall be adhered to:

PROPERTY LINE

For new building developments, curbs shall be installed before National Grid will install a gas main. Exceptions to having curbs installed may give if it is not intended to install curbs, the customer/contractor shall inform National Grid accordingly, and provide reasonable assurance that the grade level is within 6" of final grade. Gas mains are normally installed on public property (roadways), however, their location may deviate due to varying terrain, heavy growth, large trees, catch basins or, due to a request of municipal authorities. National Grid will not install a gas main when curbs have not been installed and property lines have not identified.

GRADING PREPARATION

To ensure proper earth cover for the proposed gas main, National Grid will talk with the customer or builder to determine the present and future grade of the road. This is essential where the original grade stakes have been torn up or buried. National Grid requires a 36-inch cover over its gas mains, and a minimum of a 6-inch separation between other facilities and materials.

DRAINAGE

National Grid will not release the Work Order for a gas main installation until all drainage facilities have been installed and, if existing, their locations identified by the customer, installer or the authority having jurisdiction. When drainage locations are known, National Grid can offset or place the new gas main above or below the existing drainage facility to lessen the risk of damage to the pipeline. In certain situations the work package can be released based upon the discretion of the National Grid Field Engineer.

WATER MAINS AND SERVICE STUBS

Since water mains are installed at a greater depth than gas mains, National Grid will not install a gas main until the water main and service stub are installed and properly marked out. Water mains and services shall be installed before the gas main installation to prevent interference between the two piping systems and to eliminate the possibility of the gas main being damaged when a water main is installed.

OTHER OBSTRUCTIONS

On the day that National Grid is scheduled to install the gas main, the contractor shall remove all obstructions such as dirt piles, building materials, equipment or vehicles that will prevent National Grid from installing a gas main. The area, when the new gas main is to be installed, shall be cleared before trenching of the new gas main begins.

NEW GAS SERVICE INSTALLATION REQUIREMENTS

Before installation of a new gas service, the customer/contractor shall have the construction area free of any violations. All violations shall be cleared before any gas service Work Order is released for construction. For National Grid construction activities to take place, the following requirements shall be adhered to:

GRADE, COVER

It is important that the grade be as close to the proposed finished minimum grade of 6" below final grade before National Grid releases the service to be worked. This is to ensure that proper earth cover exists for the proposed service. The depth of **cover** required for a gas service is 24 inches for public property and a minimum of 18 inches for services on private property.

WATER SERVICE

Often, water services are installed on the opposite side of the building away from the gas service. If the water service is installed in close proximity to the proposed gas service, National Grid requires that the **water service** be installed **before the gas installation**. This is required since the water service is installed at a depth below National Grid's gas service. Therefore, the **water service must be installed** to prevent the gas service pipe from being damaged by the water service construction. A water service shall be kept a minimum of 3 feet away from a gas service measured in any direction.

CESSPOOLS & SEPTIC TANKS

If cesspools or septic tanks are to be constructed in proximity to a proposed gas service, that construction and back filling shall be completed first before National Grid will install a gas service. Experience has shown that equipment used for excavating cesspools or septic tanks have often torn up National Grid's piping when the gas service is installed before the installation of a cesspool or septic tank.

BUILDING MATERIALS

Building material, such as lumber, sheetrock, pallets, scaffolding, dumpsters, bricks, etc. located in the path of the gas service, will cause delays in the installation of the gas service. The customer and/or builder shall maintain a clear area or path so that trenching or missiling for the new gas service can be accomplished.

DIRT PILES

Dirt piles of a size requiring additional work in excess of normal trenching or missiling operations shall be removed by the customer or builder before the release of the job.

FOUNDATION ONLY

Gas services shall not be installed where only a building foundation exists.

STRUCTURES NOT BUILT YET

National Grid will not run gas services or stub to any proposed buildings or other structures, or run services beyond the property line. If deemed necessary by National Grid, we will install a service stub/main to the property line for any proposed building.

TRENCHES

Contractors electing to provide their own trenching for National Grid's facilities shall adhere to the following requirements. Contractors shall trench only on private property.

COVER

Trenches for facilities shall meet the following minimum cover requirements:

- 36" for Gas Mains
- 24" for Gas Services on Public Property
- 18" for Gas Services on Private Property

TRENCH BOTTOMS

Trench bottoms shall be smooth and free of rocks or debris that could damage plastic mains or services, or could damage protective wrapping on steel mains or services.

SPOILS

All spoils shall be placed a minimum of 24" from the edge of the trench.

SEPARATION, GAS VS. ELECTRIC/TELEPHONE/CABLE

If trenching is to be accomplished for placement of facilities in a common trench, trench must be wide enough to allow for a 6" minimum separation between buried gas facilities and buried electric, telephone and cable facilities. National Grid will not place facilities into trenches unless the requirements for proper separation are met, as defined below.

3-PHASE PRIMARY LATERAL WITH GAS

If trenching is to be accomplished for installation of gas facilities along with a 3-phase primary lateral service, a minimum of 12" separation must be provided between electric lines, and a minimum of 6" separation must be provided between gas and electric lines.

SEPARATION OF FACILITIES

If trenching is to be accomplished for installation of gas and electric services on private property, the minimum cover on gas and secondary electric is 24" with a minimum of 6" separation between the two services. If the service is primary, it may be placed in a conduit at 24" cover; if it is direct-buried, it must have a minimum of 30" cover.

BACKFILL AND PERMANENT RESTORATION

When contractors provide trenching on private property, backfilling of the trench along with the temporary and permanent restoration of the work area shall be the responsibility of the customer/contractor and shall be completed in accordance with CNST01003. When National Grid trenches on private property, National Grid will provide temporary restoration of terrain or pavement.

4.2 REQUIREMENTS FOR HAVING A NEW RESIDENTIAL AND SMALL COMMERCIAL GAS SERVICE INSTALLED

- 4.2.1 Please contact 1-800-460-0054 and advise if the installation is a residential, commercial or industrial building, and, if you are a builder. Once the work order is assigned, a determination will be made if gas is available at your location. Residential applicants may initiate the application process by telephone. Commercial and industrial customers are required to initiate their applications in writing.

Please note that if gas is not immediately available in your area, the information in the following sections is not necessarily applicable. The National Grid Representative will explain the process to be used.

- 4.2.2 National Grid will determine the Rate and Service Classification most favorable to your current requirements. National Grid does not warrant that the choice will be most favorable to all possible future requirements of any applicant or customer.

- 4.2.3 The customer is advised that a search will be made regarding the payment history of the requestor with National Grid. If any credit arrears are reported or meter tampering or theft of service is found, it is possible that service could be denied.
- 4.2.4 Following receipt of the application, National Grid may schedule a field visit to the location if required and if the job requires a service only, will determine the preferred meter location with the customer.
- 4.2.5 National Grid will install the required facilities in accordance with a mutually agreed upon Customer/National Grid required by date. National Grid will track the installation with the contractor and/or customer for a timely completion and meter set, assuming all permits have been properly obtained.

4.3 COMPANY OWNED/CUSTOMER INSTALLED UNDERGROUND GAS PIPING

The builder/developer may elect to perform the trenching necessary for the installation of the buried facilities in any given sub-division. The credit per trench foot for service laterals and distribution is based on filed tariff costs provided all work is performed in accordance with National Grid specifications and schedules. This option may be discussed with the Business Lead upon initial contact.

[See Appendix A for guidelines on Company Owned / Customer Installed Underground Gas Piping.](#)

- 4.3.1 Table 4.3 is a checklist that the Builder/Land Developer can use to ensure that all requirements necessary for the design and construction of the subdivision have been submitted to National Grid.

TABLE 4.3

CONSTRUCTION DELAYS/REMEDIES

TYPE OF DELAY	REMEDY
Incomplete information from builder	Builder to follow the guidelines as stated in the pre-construction requirements
Awaiting payment of charges	Send payment for all charges associated with the subdivision in accordance with the pre-construction requirements
Design Change	Builder to notify National Grid in advance of any potential project revisions
No street opening permit	Allow National Grid three to four weeks prior to the start of installation of facilities to obtain necessary road opening permits
Proper grade not established	Established grade in the roadway area should be within six inches of final grade to ensure installation of facilities at the proper depth
Property line not clearly marked	Place stakes and/or spray paint property lines at curbs to ensure proper installation of facilities
Prolonged periods of inclement weather	Builder to allow sufficient time in the work schedule for potential weather related delays. National Grid's rules and work methods prohibit the installation of

	electric/gas facilities under non-emergency conditions during inclement weather.
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URD / UCD CHECKLIST

	REQUIREMENTS COMPLETED	DATE
1	Submitted completed "Request for UNDERGROUND ELECTRIC INSTALLATION" form.	
2	Submitted completed "National Grid Gas Request" form, if applicable.	
3	Submitted six copies of an approved subdivision map to National Grid Energy.	
4	Submitted completed "National Grid REQUEST FOR EASEMENT INFORMATION" form.	
5	Submitted payment for additions charges associated with relocation of National Grid facilities, if applicable.	
6	Submitted 10% design payment (builder only).	
7	Submitted the signed Gas Waiver Agreement if applicable.	
8	Submitted 40% material payment (builder only).	
9	Submitted 50% construction payment (builder only).	
10	Submitted 100% payment (land developer only).	
11	Submitted subdivision easement, notarized and signed by the property owner.	
12	Notified National Grid of the installation of curbs and all other proposed underground facilities.	
13	Notified National Grid that a clear unobstructed easement route of right-of-way, graded to within six inches of final grade has been provided.	
14	Submitted a completed Application Card for each home/dwelling unit requiring gas and/or electric service or (one completed application card with a complete listing of all units including lot numbers and street names) along with a completed Temporary Electrical Inspection Certificate and Gas Inspection Certificate, if applicable.	

5.0 GAS SERVICE LINE(S)

5.1 GAS SERVICE LINE(S) TO A BUILDING OR OTHER GAS USAGE

- 5.1.1 National Grid will normally provide only one gas service to a building, unless the need for more than one service is deemed necessary by the Company.
- 5.1.2 If National Grid determines that more than one gas service is required to supply gas to a building, the local codes may require that the structure be built using fire walls to isolate each area served by a gas service.

- 5.1.3 When more than one gas service is installed in a building, a permanent, weather resistant placard shall be prominently placed at each meter location to identify the number of services to the fire department when isolation of the gas service is required. It is the contractor's responsibility to provide the signs for the installation.

5.2 LOCATION OF GAS SERVICE LINE(S)/LATERAL(S)

- 5.2.1 For new construction, National Grid will install gas service piping in areas free of paved driveways or other paved areas. If it becomes necessary to locate a gas service line where it will be under a driveway or walk, the contractor shall not pave the driveway or walk until the gas service line has been installed. Alternately, the customer may opt to install a sleeve at a recommended depth of 24" with a minimum depth of 18" below grade in the area to be paved through which the gas service can be installed after the paving installation. This should first be discussed with National Grid who will advise the correct size, location and material of the sleeve prior to installation.
- 5.2.2 The contractor shall notify National Grid as early as possible of any such paving as indicated in Section 5.2.1.
- 5.2.3 A new gas service line should not be installed under or through buildings, unless no other feasible option exists. Where it is deemed prudent to install a gas service under a building (e.g., an enclosed porch, or similar enclosed areas occupied by people), National Grid shall install the service through a continuous steel sleeve, extending one foot on either side of the enclosure above it. The sleeve shall be sealed against water intrusion and vented to the atmosphere.
- 5.2.4 National Grid shall designate the exact location of the meter and service riser.
- 5.2.5 Any change requested by the customer to the location of an existing service line, if approved by National Grid, shall be made at the expense of the customer. The customer shall be responsible for hiring a contractor to install gas house line piping.

5.3 SERVICE ENTRANCE TO EXISTING BUILDINGS

- 5.3.1 Service Entry to Existing Buildings - Where an inside meter location has been selected, the gas service entry point below grade shall be enclosed in a protective pipe sleeve. The boring of the entrance hole, excavation, installing the sleeve and, sealing of the space between the sleeve and gas piping, shall be the responsibility of National Grid.

5.4 SERVICE TERMINATION POINT

- 5.4.1 The connection point of service (that point in the gas service line where responsibility ends and the customer's responsibility begins) shall be defined as the first connection point past the customer outlet side of the meter.

5.5 RESTORATION ON PRIVATE PROPERTY

- 5.5.1 For private property an agreement will be made before work begins on the restoration of the property. The amount of restoration performed by National Grid will be determined on a case by case basis.

5.6 ADDITIONAL METERS OR SERVICES

- 5.6.1 Contractors and customers are advised that in some towns and other local jurisdictions require, by law, that they be notified in writing of the addition of any gas meters or new gas services to any property. It is the contractor's responsibility to become aware of these concerns and requirements.

6.0 GAS PRESSURE

6.1 NOMINAL METER OUTLET PRESSURE WHEN SERVED FROM HIGH PRESSURE DISTRIBUTION SYSTEM

- 6.1.1 On the high pressure portion of its distribution systems, where a service regulator is installed in conjunction with the gas meter, National Grid provides gas to customers at a nominal pressure of **6" W.C.** The nominal pressure is measured immediately downstream of the gas meter or service regulator, whichever is further downstream.
- 6.1.2 **Operating/Running** pressure at the meter or regulator outlet typically can be as high as 7" W.C. or as low as 5" W. C. and can vary slightly for each installation depending on load diversity, pressure drops through the meter set piping, service regulator performance, and pressure drop through the gas meter.
- 6.1.3 When purchasing gas utilization equipment to operate on gas from the high pressure distribution system, it is recommended that equipment be chosen to function effectively based on nominal pressure of 6" W. C. at the outlet of the meter or service regulator, whichever is further downstream.
- 6.1.4 All National Grid installed regulators will be vented outside the building to atmosphere.

NOTE

National Grid will determine which gas distribution system, low or high pressure, will supply the approved load and what gas pressure can be supplied.

6.2 METER OUTLET PRESSURE WHEN SERVED FROM NATIONAL GRID LOW PRESSURE DISTRIBUTION SYSTEM

- 6.2.1 On the low pressure distribution system, National Grid provides gas at the point of entry at a pressure that can vary between 4" and 9.5" W. C. When purchasing equipment, it is recommended that the equipment be chosen which requires no more than 3.5 W.C. pressure at the burner.

6.3 PRESSURE AND CONTRACTOR

- 6.3.1 The contractor shall ensure that the customer's piping system is properly sized to prevent excessive pressure losses at the equipment. The contractor must also

ensure that the customer's installed equipment is compatible with available nominal gas pressure. Please refer to chapter 6 (Pipe Sizing) of the NFPA54 (National Fuel Gas Code)

6.4 ELEVATED METER OUTLET PRESSURE ON HIGH PRESSURE DISTRIBUTION SYSTEM

- 6.4.1 In certain instances, customer's equipment may require gas pressure higher than nominal 7" W.C. at the meter outlet.

Elevated pressures are not available throughout the entire service territory, thus all requests for elevated pressure must be approved in advance by National Grid.

Generally, National Grid will not supply elevated delivery pressures in order to allow the customer to "downsize" their house line, however, elevated pressure will be considered for this reason on a case by case basis.

- 6.4.2 If elevated pressure is approved, National Grid will normally supply gas pressures of 1/2 PSIG or more in increments of 1/2 PSIG for commercial and industrial customers.
- 6.4.3 If the customer needs elevated pressure because of gas utilization equipment requirements, the customer or customer's contractor shall provide the appropriate information in writing to support the elevated pressure request. This information shall be submitted to National Grid as soon as possible for evaluation and approval.
- 6.4.4 The customer shall also provide National Grid with the manufacturer's specifications for the gas utilization equipment. The literature furnished shall provide an explanation of the need for elevated gas pressure requirements. Upon verification of the equipment pressure requirement, if the above acceptance criteria are met and the National Grid gas system at the location can supply the elevated pressure, National Grid will furnish gas to accommodate the higher pressure need.
- 6.4.5 There may be costs associated with the fabrication of the regulator and meter installation, these costs will be explained with National Grid.
- 6.4.6 The minimum design pressure in high pressure distribution system varies depending on differing loads and weather conditions, as well as normal periodic maintenance within system. These factors can cause occasional periods of low gas pressure in the customer's fuel line. Therefore, it is policy to supply gas at the meter outlet or regulator of a value no greater than the minimum pressure of high pressure gas main serving that area.

NOTE

Customers, Owners and/or Contractors shall contact National Grid if they are planning to make any additions or modifications to a gas piping system so that National Grid may provide a safety review of your plans.

6.4.7 Under certain conditions where the customer's load requirements and gas utilization equipment qualify, National Grid will discuss with the customer the availability of supplying line pressure where there is no service regulator at the meter header. In these cases, the customer is advised that the gas pressure would vary nominally with any variations in high pressure gas distribution system.

6.5 **ELEVATED METER OUTLET PRESSURE ON LOW PRESSURE DISTRIBUTION SYSTEM**

6.5.1 In certain geographic locations, only low pressure gas may be available. In these areas, if elevated meter outlet pressure is required, a gas booster may be necessary. Contact National Grid for details.

7.0 **METERS AND REGULATORS**

7.1 **PREREQUISITES AND NOTIFICATIONS FOR NEW GAS METERS**

7.1.1 At least one gas appliance, properly installed and connected to the gas piping system, is required as a prerequisite before National Grid will install a new meter and turn on the gas supply to the customer.

7.1.2 For all commercial, industrial and multi-family installations, a contact must be made to the National Grid Customer Order Processing Team at 1-800-460-0054 as early as possible in the job process prior to commencement of work. The purpose of this contact is to:

- Review construction schedule and set commitment dates.
- Review the service installation construction requirements.
- Review meter header location site and meter set construction specifications
- Review inspection requirements.
- Review National Grid supplied construction items.

7.2. **METER SET LOCATION REQUIREMENTS**

7.2.1 All meter sets shall be located on the outside of any building unless it is impractical, unsafe or prohibited by law.

7.2.2 All meter sets shall be installed following the clearance requirements indicated in the appropriate Construction Standard. For information on distances of electric meters from gas meters, refer to 020013-CS.

- 7.2.3 Outside and inside gas shut-off valves shall be readily accessible at all times to National Grid and emergency service personnel and shall not be covered or obstructed.
- 7.2.4 The installation of meter sets in driveways, under windows, under building overhangs or near fresh air intakes should be avoided where practical. In those cases where the regulator vent cannot be located to meet clearance requirements, National Grid shall be responsible for installing regulator vent piping according to 020013-CS.
- 7.2.5 Meter set locations shall not be located under combustible stairways reference 16 NYCRR 255.353 (d.).
- 7.2.5 Meter sets shall not be installed below ground in vaults without National Grid approval.
- 7.2.6 The metering of large quantities of gas or the installation of meter sets and regulators in schools, commercial buildings or industrial buildings, including multiple meter headers, may require meter rooms, or special construction or piping. Consultants and installers of such facilities are advised to consult with National Grid.
- 7.2.7 Although it is not desirable and should be avoided, gas regulator may be placed under windows provided that the following conditions are met: See 020013-CS:
- No other suitable location is available
 - Proper regulator venting is possible

7.3 INSTALLATION AND INTERCONNECTION REQUIREMENT

- 7.3.1 The meter header shall be installed according to the National Grid construction standard.

NOTE

To avoid delays and possible repeat visits to the site, it is critical that the contractor adhere to the space dimensions specified between meter connections. Consult the appropriate Construction Standard for these dimensions prior to the start of construction.

- 7.3.2 National Grid will supply and install, at the time of meter installation, the meter swivels, nuts, bolts, and gaskets required to connect the meter to the meter header.
- 7.3.3 On all meter headers, the contractor shall be responsible for houseline interconnections with facilities.
- 7.3.4 Piping and fittings used on outside meter sets shall be welded and painted steel pipe, or screwed and painted black pipe.

NOTE

Customer piping from the gas meter outlet connection through the building wall must consist of hard piping. Once through the wall, you may transition to CSST. Refer to Appendix D of this book for CSST installation requirements.

- 7.3.5 The customer's pipe connecting to the meter header shall be installed and supported following the National Grid Construction Standards, NFPA 54, FGCNYS and the requirements in this book.
- 7.3.6 Prior to requesting a meter installation, the contractor shall be responsible for the installation of plugs or caps on any open ended pipe or fittings on customer fuel lines to prevent entry of dirt and debris ensuring the integrity of the gas piping system.

7.4. **INDOOR METER SET REQUIREMENTS**

- 7.4.1 Meter sets shall be approved for indoor installation only when, in judgement, an outdoor installation is impractical, unsafe or prohibited by law.
- 7.4.2 Indoor meters shall be installed according to the National Grid Construction Standards and written specifications provided by National Grid. On all indoors meter sets, the meter and regulator must be a minimum of 36" from a source of ignition. For information on distances from gas and electric meters, refer to National Grid Standard 020013-CS

NOTE

When the service regulator must be installed inside the building, the service regulator and meter shall be located immediately downstream of the exposed service line valve.

7.5 **INDOOR METER SET REQUIREMENTS FOR LARGE INSTALLATIONS**

- 7.5.1 For Buildings of Public Assembly, apartment buildings, or for construction within an apartment, industrial or commercial complex, each with a capacity of seventy-five or more persons, the following specifications shall apply when meters/regulators are installed indoors:
- Where practicable, the regulator, valves and other gas equipment shall be installed within a separate room that is designed for two-hour fire resistance and effectively sealed from the remaining space in the building. These meter rooms shall also meet all code requirements.
 - The customer shall post a notice prohibiting unauthorized persons from entering the meter room to prevent tampering. A conspicuous and permanent notice shall be posted on doors or access leading to the specific installation indicating the actions to be taken, and the telephone number of the proper person to be called, in the event a gas odor is detected. The lettering shall be of bold type, at least one inch in height, properly spaced to provide good legibility and contrast with background.

- Gas meter rooms shall be properly ventilated, lighted, and kept free of trash and rubbish at all times. Outside air for ventilation of a meter room shall be furnished as a separate supply, and shall not be shared with any other room.
- Meter rooms shall not be used for storage purposes, including building materials or equipment.
- Meter rooms shall not be used in the volume calculation in determining the combustion and ventilation air available for gas utilization equipment.

7.6 MULTIPLE METER HEADER REQUIREMENT

- 7.6.1 Gas meters, along with associated customer owned piping at multiple meter locations, shall be plainly identified by the installing contractor using a metal tag or other permanent means. These markings shall clearly identify the building or part of the building being supplied by the piping on each meter. These markings shall be completed by the contractor before National Grid will install the gas meter and turn on the gas supply.

7.7 METER SET PROTECTION REQUIREMENT

- 7.7.1 In cases where outdoor and indoor meter set locations that may be exposed to vehicular or other equipment damage it is the responsibility of the customer to provide protection posts at the time of riser installation. Protection posts are to be installed per National Grid Construction Standard MTRS-6060.
- 7.7.2 In areas where vandalism might be anticipated, a protected meter area may be required, or meters may need to be protected by a suitable wire fence if specified by National Grid.
- 7.7.3 It is position that, when the specifications established in National Grid Construction Standard MTRS-6060 are not followed, National Grid will not set the new meter until adequate protection is provided.

7.8 METER HEADER PAD REQUIREMENTS FOR LARGE GAS INSTALLATIONS

- 7.8.1 The customer shall be responsible for the installation of a concrete gas meter pad for all rotary and turbine meter installations where a meter pad is required. Meter pads are required to support the weight of the meter and its associated gas header piping, valves and in some cases the weight of gas house line interconnection piping.

7.9 WALLS TO SUPPORT METER HEADER REQUIREMENTS

- 7.9.1 Vertical meter headers may not require a wall to support the piping, meter, and regulator.
- 7.9.2 In cases where **National Grid** Construction Standards shows meter set piping supported by a wall, a wall shall be constructed by customer to support the meter

set if one does not already exist. In some cases, where a wall does not exist, a horizontal meter set may be specified instead if space requirements are adequate.

7.10 RELOCATION OF GAS METER SETS AND SERVICE LINES

- 7.10.1 Gas meter or service line relocation, such as moving a meter from one outdoor location to another outdoor location, or from an inside location to an outdoor location, shall be performed at the customer's expense. It is National Grid policy to avoid moving any inside meter to another inside location.
- 7.10.2 To request meter relocation, contact National Grid at 1-800-460-0054. National Grid will schedule a field visit to review scope of work.
- 7.10.3 When contractors perform the relocation of the customer owned-piping shall be responsible for:
 - Interconnection of piping with the National Grid piping at the connection point of service
 - Obtaining necessary piping permits from local authorities, if applicable.

7.11 GAS SERVICE REGULATOR AND VENTING REQUIREMENTS

- 7.11.1 National Grid will select, furnish, install and adjust all service regulators when the gas is supplied by high pressure gas distribution system.
- 7.11.2 Service regulator vents shall not be covered over, plugged up, or otherwise obstructed.

7.13 TELEMETERING INSTALLATION REQUIREMENTS

- 7.13.1 Customers with interruptible rate classification shall be remotely monitored using telemetering equipment. This requirement may result in additional cost to the customer.
- 7.13.2 The customer shall be responsible for the installation of a dedicated phone line (where required) routed to a location designated by National Grid, terminating with an appropriate network interface.
- 7.13.3 The customer shall be responsible for any trenching, drilling, conduits, restoration, supports, etc. that may be required to reach the National Grid telemetering device.
- 7.13.4 National Grid will install the interconnecting cable between the customer-provided interface and the telemetering device.

7.14 METER INSTALLATION, PURGING AND RELIGHTING –

See Appendix F on Properties of Natural Gas including purging and odor fade requirements.

- 7.14.1 For commercial, industrial and some multi-meter installations for increased load requiring increased meter or regulator size where National Grid is required to shut down the existing gas service, the contractor may be required to purge air from the system upon reconnection, in conjunction with National Grid personnel to relight all gas utilization equipment affected by the shutdown.
- 7.14.2 For all commercial new meter sets, the installing contractor shall be responsible for purging the fuel line and for starting up the equipment.
- 7.14.3 For residential new meter sets, National Grid will purge the gas piping system and light all operating gas appliances at the time of the new meter set. Appliances that are not ready for operation at the time of the meter set shall be started up by the installing contractor.
- 7.14.4 Where the gas service is turned off for Company purposes, National Grid will be responsible for the turning off all affected appliances, performing an integrity test of the gas piping system prior to the turning on and gassing in, and relighting all affected appliances.
- 7.14.5 For new meter sets serving large input gas utilization equipment, the burner installer shall be responsible for purging as per NFPA 54, or FGCNYS.

8.0 CUSTOMER INSTALLED - COMPANY OWNED GAS PIPING SYSTEMS

- 8.1 National Grid is committed to providing you with safe reliable gas service. This is already done by the installation specifications and maintenance requirements by which we supply gas to you up to your gas meter. Another part of this commitment includes assisting the customers with an option to install their own National Grid service line. In the construction of new gas facilities, there may be situations where the customer opts to construct a portion of the service line when economics or other factors are involved.

The purpose of this Section is to provide you with information that you will need if you plan to construct your National Grid underground service line.

- 8.2 This standard applies to a gas service line (as defined by Department of Transportation-Title 49, Part 192 and New York State Codes, Rules and Regulations-Title 16, Part 255) that is partially installed by the customer. Upon acceptance and pressurization, National Grid assumes the ownership of the entire service, including all operations, maintenance and replacement options. Because of this ownership, National Grid will ensure all specifications and standards are strictly adhered to before the meter is set & the service is turned on. Any deficiencies MUST be corrected before this can occur.

This standard applies to gas service line sizes of 1" CTS and 1 ¼" IPS , using coiled plastic pipe with mechanical stab type fittings. Any customer installed,

National Grid owned, service line that does not meet the scope of this standard will require specific written guidance from National Grid.

8.3 Construction Requirements

[See Appendix A for Company Owner / Customer Installed pipe](#)

9.0 **BURIED CUSTOMER OWNED GAS PIPING SYSTEMS (YARD & SERVICE LINES)**

- 9.1 This section provides the standards for Customer Owned / Installed underground gas piping. National Grid is committed to providing you with safe reliable gas service. This is already done by the installation specifications and maintenance requirements by which we supply gas to you up to your gas meter. Another part of this commitment includes assisting you with the installation of gas lines that you, as a customer/contractor, may install to make use of our product.

The purpose of this booklet is to provide you with information that you will need if you plan to construct your own underground gas piping. Please remember that whenever you plan to install any underground gas line, we are here to help you. We would prefer that you use the same materials that we use so that in the event of a leak, break or other damage on your privately owned underground piping, we can assist you in the maintenance and repair of your gas line. Additionally, if we know where your buried gas lines are, we will survey them for leaks on a regularly scheduled basis --- free of charge.

- 9.2 A vital part of providing this service to you is to help you understanding of the two classifications of underground gas piping (as defined by the Federal Government and New York State) that you might utilize to supply gas to various outside appliances, equipment or other buildings or structures on your property. These two classifications are underground **service line** and underground **yard line** and they will be explained in the following sections.

[See Appendix B Customer Owned / Installed Underground Gas Piping](#)

10 **CUSTOMER OWNED INTERIOR PIPING**

- 10.1 Before proceeding with the design and installation of gas piping systems, contractors are advised to refer to the National Fuel Gas Code (NFPA 54) or the FGCNYS. It is strongly recommended that a review of the local plumbing requirements also be performed to ensure that the proposed installation is in compliance with local codes.
- 10.2 When a new appliance or other gas load is added to an existing gas piping system, the contractor/customer shall verify the capacity of the existing piping for adequacy according to the capacity table(s) in NFPA 54,. If necessary, existing gas piping shall be replaced with larger piping or additional piping installed that also conforms to the NFPA 54, FGCNYS. capacity tables.
- 10.3 Gas Pipe Bonding: "Each above ground portion of a gas piping system that is likely to become energized shall be electrically continuous and bonded to an

effective ground fault current path. Gas piping shall be considered to be bonded where it is connected to gas utilization equipment that is connected to the equipment grounding conductor of the current supplying that equipment.”

11 PIPE SIZING BEYOND THE METER

- 11.1 All gas piping, including trunk and branch lines, shall be adequately sized according to the National Fuel Gas Code (NFPA 54). Gas Ranges shall have a minimum pipe size of 3/4” nominal size.

11.2 GAS PIPING MATERIALS

Materials used for gas piping shall be selected according to the provisions of NFPA 54, or FGCNYS, local codes and the requirements listed in the following sections.

11.3 GAS PIPING MATERIALS, INDOORS

For indoor gas piping, materials used shall be one or a combination of the following, complying with the latest ANSI standards for steel pipe, ANSI B36.10:

- Steel pipe must be standard weight (Schedule 40) with screwed or welded joints. ASTM A53 or ASTM 106 shall be used as a minimum.
- Threaded gas fittings shall be 150 pound class, malleable iron or forged steel.
- **Copper** tubing of any type is **prohibited** for indoor use.
- **Plastic** pipe of any type is **prohibited** for indoor use.
- **Cast iron** pipe is **not permitted** under any circumstances.
- **Corrugated Stainless Steel Tubing**: For natural gas piping inside and outside buildings, a recently developed system of piping Corrugated Stainless Steel Tubing (CSST) has been recognized by the National Fuel Gas Code since 1988, and is becoming more popular within our service territory. CSST provides another option for gas piping in addition to steel. It is to be used where permitted by local codes. **See Appendix D for CSST piping in all areas of New York State.**

NOTE: On outside meter sets where the customer uses CSST as distribution piping / house piping, the piping from the meter outlet to a point inside the building shall be standard wall steel piping. The piping shall transition to CSST from a point inside the building. CSST shall not pass through exterior building walls.

NOTE

Contractors are advised to exercise extreme caution when choosing to use CSST on an installation since some jurisdictions may not have approved this piping option.

Contractors and builders interested in learning more about this economically favorable alternative are strongly encouraged to review the relevant sections in NFPA-54, FGCNYS .

11.4 GAS PIPING MATERIALS, OUTDOORS, ABOVE GROUND

- For piping outdoors, above ground, including customer owned regulator vent piping, **properly coated black steel pipe** with screwed joints shall be used.
- Where welded joints are required, ASTM A53 continuous weld pipe shall be used as a minimum, but ASTM A106 is recommended.
- **Cast iron** pipe *is not permitted* under any circumstances.

11.5 VALVES

- 11.5.1 Listed, design-certified manual shut-off valves shall be used as main shut-offs for each gas appliance installations according to the requirements in NFPA-54, FGCNYS, **and local codes**.

11.6 STEEL GAS PIPING, WELDING REQUIREMENTS

11.6.1 GENERAL

When welded construction is used, above or below ground, indoors or outdoors, welders shall be certified by recognized certification and testing agencies for pipeline welding in accordance with API 1104 or ASME Section IX. Written welding procedures shall be followed to ensure the acceptability of field welds. Welders' certifications shall be available at the construction site.

11.6.2 RESIDENTIAL, COMMERCIAL, INDUSTRIAL, MULTI-FAMILY INSTALLATIONS

The maximum design/operating pressure for gas piping systems located inside buildings shall not exceed **5 psig** unless:

Approved by National Grid ***and one or more*** of the following ***conditions*** are met:.

- 1. The piping system is welded
- 2. The piping is located in a ventilated chase or otherwise enclosed for protection against accidental gas accumulation.
- 3. The piping is located inside buildings or separate areas of buildings used exclusively for:
 - Industrial processing or heating,
 - Research,

- Warehousing, or
- Boiler or mechanical equipment rooms.
- The piping is a temporary installation for buildings under construction.

– 4. The piping serves appliances or equipment used for agricultural purposes.

11.6.3 ALL PUBLIC AND PRIVATE SCHOOL BUILDINGS

For New York State Schools, refer to **the Manual of Planning Standards Section S709 F.** **Section S709 F states:**

1. Gas piping with a working pressure up to 12" W.C. must be welded for pipe sizes 3" and over. The completed line is to be pressure tested with air or inert gas for a minimum of one hour at 15 psig.
2. Gas piping with a working pressure above 12" W.C. must be welded for pipe sizes 3" and over. The completed line is to be pressure tested with air or inert gas for a minimum of one hour at 1.5 (one and one-half times) times the working pressure or a minimum of 50 psig.

11.6.4 FOR PRESSURE TEST REQUIREMENTS - Refer to NFPA 54 Section 8.1.4

Per NFPA 8.1.4.2

The test pressure to be used shall be no less than 1.5 times the proposed maximum working pressure, but not less than 3 psi (20 kPa), irrespective of design pressure. When the test pressure exceeds 125 psig (862 kPa), the test pressure shall not exceed a value that produces a hoop stress greater than 50 percent of the specified minimum yield strength of the pipe.

Per NFPA 8.1.4.3 Test Duration: The test duration shall be not less than ½ hour for each 500 ft³ (14 m³) of pipe volume or fraction thereof. When testing a system having a volume less than 10 ft³ (.28 m³) or a system in a single-family dwelling, the test duration shall be a minimum of 10 minutes. The duration of the test shall not be required to exceed 24 hours.

11.7 GAS PIPING (INDOORS AND OUTDOORS) ABOVE GROUND, INSTALLATION REQUIREMENTS, GENERAL

- 11.7.1 Gas piping in concealed locations shall be installed according to the requirements in NFPA-54, FGCNYS, **or local codes**. If it is desired to locate concealed gas piping in partitions, piping shall be located in hollow partitions, such as in ventilated chases. Concealed piping in solid partitions is prohibited.
- 11.7.2 Gas piping inside or outside of any building shall not be run in or through an air-duct, clothing chute, chimney or flue, ventilating duct, dumb waiter or elevator shaft.

- 11.7.3 No other piping or wiring shall be located in a casing containing a gas line.
 - 11.7.4 Gas lines passing through concrete or masonry walls, floors or slabs shall be enclosed by a sleeve.
 - 11.7.5 Gas piping extending through foundation walls shall be sleeved and sealed according to the requirements in NFPA-54, FGCNYS, **and local codes**
 - 11.7.6 The use of gas piping as a grounding electrode is prohibited.
 - 11.7.7 Sediment traps for gas piping shall be installed according to the requirements in NFPA-54, FGCNYS, **and local codes**. When not incorporated as part of the equipment, a sediment trap shall be installed downstream of the equipment shutoff valve (exception: dryers, ranges, outdoor grills and illuminating appliances)
 - 11.7.8 Where a branch outlet is placed on a main supply line before it is known what size pipe will be connected to it, the outlet shall be of the same size as the line that supplies it.
 - 11.7.9 Shutoff valves controlling several gas piping systems shall be accessible for operation and shall be installed so as to be protected from any physical damage. Gas shutoff valves shall be plainly marked with a metal tag by the installer so that each piping system supplied by the valve can be readily identified.
 - 11.7.10 Gas piping shall not be supported by other piping but shall be supported directly by the building structure itself with pipe hooks, metal straps, bands, or hangers suitable for the size of the pipe, and of proper strength and quality at proper intervals so that the piping cannot be jarred or displaced accidentally from its original position.
 - 11.7.11 Listed and approved flexible connectors shall be used for final connections to gas appliances provided the flexible connectors are used on moveable equipment such as gas dryers and gas ranges only, and are placed on the appliance side of the appliance shut-off valve. Certain manufacturers of selected equipment supply flexible connectors for permanent mounted gas utilization equipment. In those cases, the manufacturer's specified flexible connectors shall be installed according to the manufacturer's installation instructions **and local codes**.
 - 11.7.12 Flexible connectors shall not pass through floors or partitions.
 - 11.7.13 For steel gas piping installed outdoors above ground, piping shall be protected with a suitable oil based painting system, or by use of one of the coating systems identified in Section 11.8 of this book.
- 11.8 STEEL GAS PIPING, CORROSION PROTECTION REQUIREMENTS, COATING AND WRAPPING
- 11.8.1 For steel pipe, above ground or below ground, the following information shall be used for coating and wrapping. If ***bare steel pipe*** (as opposed to mill wrapped

pipe) is used ***below ground***, the following procedures are ***mandatory***. If bare steel pipe is used above ground, these procedures are optional, as opposed to use of oil based painting systems.

11.8.2 Steel piping shall be given a primer coating and then wrapped with a tape suitable for underground use. Do not use Electrical Tape. See National Grid Construction Standards **COR02001 and 030031-CS**. The pipe surface shall be clean and free of rust prior to applying the primer coat. Tape wrapping shall be spirally wound with a half overlap on each turn **it is recommended that the exposed threads be painted**.

11.8.3 The following materials are acceptable for coating and wrapping steel pipe:

- Polyken Technologies Pipeline Primer #1027 or equal, in conjunction with Polyken Tape #936 or equal, or Polyken Gas Utility Tape or equal.
- Tapecoat Company CT Coldprime or equal in conjunction with Tapecoat Pipe Tape H-30 or H-50 or equal.

11.9 STEEL GAS PIPING, CORROSION PROTECTION REQUIREMENTS, INSULATING JOINTS

11.9.1 Insulating couplings or fittings shall be used to electrically separate the underground portion of steel piping from the above-ground piping or the piping in a building. The insulators shall be located on the above ground portion of a riser and on the pipe immediately after entering a building wall. No other connections shall be made to the underground portion of piping that could result in an electrical ground to the piping, since this will cause the insulators to be ineffective. Insulating unions, threaded or insulating coupling or insulating flanges are typically used for these connections.

11.10 STEEL GAS PIPING, CORROSION PROTECTION REQUIREMENTS, MAGNESIUM ANODES

11.10.1 Magnesium anodes shall be electrically attached to the underground steel piping using a thermite welded (often called “cadweld”) connection. These anodes are available in 3 pound and 17 pound ingot sizes with a wire connection lead attached.

11.10.2 One 3-pound anode shall be installed where the total underground piping length is 10 feet or less. When the total length of underground pipe is greater than 10 feet, install one 17-pound magnesium anode for every 100 feet of underground piping. ***Note: Always bury an anode with the container it comes in. Do not remove it from the cardboard box!***

11.10.3 The anode ingot shall be buried in the soil approximately 2 feet to the side and below the level of the piping at a location near the center of the section pipe being protected.

11.10.4 The wire lead shall be attached to a bare steel area of the pipe using a thermite weld kit, using a #15 Green Cap cartridge specifically manufactured for

attachment to schedule 40 pipe. After attaching, the coating in the thermite-welded area shall be restored (re-coated) so that no bare metal remains.

11.11 PLASTIC PIPING, INSTALLATION REQUIREMENTS

- 11.11.1 New York State code requires that plastic pipe and fittings shall be installed by qualified personnel according to the manufacturer's written installation instructions.
- 11.11.2 Before using materials, visually inspect for damage such as gouges, scratches and kinks, and discard any damaged materials.
- 11.11.3 PE pipe and tubing must be laid on undisturbed or well-compacted soil or other continuous support. Suitable rock-free back-fill shall always be placed around the pipe or tubing.
- 11.11.4 In addition to the minimum depth of coverage (18"), consideration must be given to future loading and activity above and around the piping to determine if encasing the pipe in a steel sleeve is necessary.
- 11.11.5 Pneumatic or mechanical tamping shall not be used within 12" of the plastic piping.
- 11.11.6 Pipe or tubing must be free of cuts and scratches deeper than 10% of the wall thickness. Defects in pipe, tubing or fittings cannot be repaired. Therefore, the damaged pipe, tubing or fittings must be replaced. PE pipe shall not be used inside buildings or above ground.
- 11.11.7 PE pipe and tubing shall be joined by heat fusion or by mechanical fittings (mechanical service head adapters).
- 11.11.8 Mechanical fittings shall not be used where pressure exceeds 5 psi or pipe size is greater than 4" diameter, except in certain instances where a customer-owned piping system qualifies. The preferred joining method is an all fused plastic system (electrofusion or butt fusion). PE mechanical stab and full restrained (locking) compression fittings (made for natural gas) are permitted as approved by National Grid. If a metallic mechanical fitting is used as a last resort, the mechanical coupling shall be cathodically protected from corrosion by industry approved field coating and the installation of a 3# anode.
- 11.11.9 Heat fusion joints shall be made according to the manufacturer's recommended heat fusion procedures.
- 11.11.10 Miter joints are not permitted.
- 11.11.11 Joints shall not be located in pipe bends.
- 11.11.12 See the pipe manufacturer's requirements for minimum bending radius of plastic pipe.

11.11.13 *Heat fusion joints shall be performed only by personnel qualified in the appropriate joining techniques.*

11.11.14 A #14 AWG, minimum, insulated solid copper wire shall be installed alongside but not touching the plastic pipe to facilitate locating with a pipe locator. Tracer wires shall terminate in an accessible location above ground so that a pipe locator can be connected.

11.11.15 A bright-colored plastic warning tape shall be buried approximately 12" below final grade to mark the location of the pipe and to warn future excavators.

11.11.16 Insulating couplings or fittings shall be used to electrically separate the underground portion of plastic piping from the above-ground steel piping or the piping in a building. This is necessary to protect the gas riser, and also is necessary for anode less, pre-coated riser.

11.11.17 Plastic Fuel Gas Piping installations shall be performed by trained, qualified and certified personnel by National Grid.

11.12 GAS PIPING THROUGH BUILDING WALLS, ABOVE OR BELOW GROUND, INSTALLATION REQUIREMENTS

11.12.1 That portion of customer-owned outdoor steel gas piping, **above** ground that runs through an external building wall (the wall piece) shall be coated or wrapped using one of the coating and taping systems listed in Section **11.8.3** of this book. This requirement shall be applicable to all steel pipe, including black pipe, and to piping above ground that runs through walls. **PVC tape is not acceptable for wrapping pipe for this purpose.**

11.12.2 For wall penetrations below ground a sleeve is required for this application.

12.0 GAS UTILIZATION EQUIPMENT

12.1 GENERAL

12.1.1 APPLIANCES- ACCESSORIES AND EQUIPMENT APPROVAL

All of the gas appliances and accessories that National Grid services, and referred to in this book shall be design-certified by a nationally recognized testing and/or listing agency, such as CSA or Underwriters Laboratories (UL) to comply with the applicable American National Standard.

12.1.2 INSTALLING CONTRACTOR'S RESPONSIBILITIES

The work performed by the contractor shall comply with the applicable Building Code, and all departments and bureaus having jurisdiction over the installation. The contractor shall obtain all necessary permits and certifications that may be required for the job.

Requirements for gas utilization equipment, collected together in the following sections, are intended to supplement or amplify, but not substitute for, any

applicable State, City, Town or Village codes, regulations or ordinances. If there is a conflict between the National Grid requirement and the municipal requirement, ***the more stringent requirement will govern.***

In all cases, it is the installer's responsibility to comply with all local municipal requirements. National Grid does not assume the obligation of enforcing or inspecting for compliance with municipal code requirements.

12.1.3 Carbon Monoxide (CO) ALARMS

Carbon Monoxide (CO) is a highly toxic gas. It is the product of incomplete combustion of fossil fuels such as oil, natural gas, propane, gasoline, wood and coal. CO is very dangerous because it is colorless, odorless and tasteless.

National Grid recommends the installation of CO Alarms in accordance with applicable codes and recommends annual maintenance of the heating system.

For the correct location of CO Alarms and for the full text of the NYC and NYS CO Alarm Law, [See Appendix E.](#)

12.1.4 ASSEMBLY OF EQUIPMENT

The installing contractor shall assemble the equipment according to the installation instructions of the manufacturer.

12.1.5 GAS UTILIZATION EQUIPMENT INSTALLED IN RESIDENTIAL GARAGES

Gas utilization equipment installed in residential garages and in adjacent spaces that open to the garage and are not part of the living space or dwelling unit, shall be installed so that all burners and burner ignition devices are located at a minimum of 18" above the floor unless the equipment is listed as "Flammable Vapor Ignition Resistant" per NFPA-54.

12.2 NATIONAL GRID "NATURAL GAS PRESSURE, IGNITION & DRAFT TEST"

On new gas meter installations National Grid will perform a natural gas pressure test (lock up & run). National Grid's service personnel will also test for proper ignition, combustion, venting (draft test), ventilation (make up air) and the operation of a pilot safety, if so equipped.

12.3 GENERAL REQUIREMENTS, SPACE AND WATER HEATING EQUIPMENT INSTALLATIONS

12.3.1 Certified Rating plates shall be securely fastened to the appliance.

12.3.2 A complete set of manufacturer's operating, installation and maintenance instructions shall be made available.

12.4 COMBUSTION, DILUTION AND VENTILATION AIR (FRESH AIR) REQUIREMENTS

12.4.1 Air for combustion, dilution and ventilation air installed in any size room shall be installed according to the requirements of NFPA-54, FGCNYS.

12.5 VENTING OF CATEGORY I GAS UTILIZATION EQUIPMENT ONLY

12.5.1 Venting of all equipment shall be provided according to the latest version of the National Fuel Gas Code, NFPA 54, FGCNYS.

12.5.2 Manufacturer's design for draft hoods on gas designed equipment shall not be altered.

12.6 VENTING OF GAS UTILIZATION EQUIPMENT - CATEGORIES II, III AND IV

12.6.1 Venting for Category II, III and IV equipment (as defined in NFPA 54, FGCNYS) shall be installed according to the manufacturer's installation instructions.

12.7 CHIMNEYS

12.7.1 **The contractor shall perform an inspection on the chimney venting system to ensure it confirms to nationally recognized standards.** The contractor shall not install a flue connector into a chimney breach opening that is smaller than the connector, or extend the breaching beyond the chimney lining. Under no circumstances shall this rule be violated.

12.7.2 For the proper sizing of vents connected into Type B Double Wall Vents, Interior and Exterior Masonry Chimneys, please follow the Venting tables listed in NFPA-54, FGCNYS. Special care must be taken when venting new equipment into an existing exterior masonry chimney. For additional information on Venting and Combustion Air, please refer to: "Choosing a Furnace or Boiler" in [Appendix C](#).

NOTE: At no time shall a new gas heating appliance be installed into an unlined chimney.

12.8 SPILL & FLAME ROLL OUT SWITCH REQUIREMENTS

12.8.1 A manual reset thermal cut-off device (spill switch), UL tested and approved, shall be required on all natural-draft, gas-fired equipment used for space heating; i.e., all boilers, furnaces and conversion burners. This device shall shut off the gas to the burner in the event of chimney blockage or continued back draft. It is important to note that, as of January 1, 1991, boiler manufacturers are **required** by Federal law to provide both a **spill switch and flame roll out switch** on all **new** atmospheric gas boilers and furnaces having a rating of 300,000 Btuh or less. Interpretation of this ruling is to expand the requirement for spill switches to all natural draft appliances regardless of vent size, or whether or not the appliance is installed in a residential, commercial, industrial or multi-family establishment. For gas **conversion burners** that are installed in residences and other occupancies that utilize masonry chimneys or gas vents, a manual-reset

thermal spill switch is also required. Add-on spill switches shall also be UL tested and approved.

12.9 INSTALLATION OF HEAT PRODUCING EQUIPMENT IN FLAMMABLE OR CORROSIVE ATMOSPHERES

12.9.1 In operations where there is use of flammable liquids or agents, or aerosol sprays using halogenated hydrocarbons such as carbon tetrachloride (e.g., dry cleaners, hair salons, electroplating, etc), special care shall be taken in the installation of heat-producing equipment. Flammable liquids clearly must be kept a significant distance away from gas burning flames for safety reasons. Not so apparent, however, halogenated hydrocarbons tend to break down in temperatures above 500 degrees F and form toxic fumes. These fumes are extremely corrosive and will accelerate damage to heat producing equipment, flues and exposed metal surfaces.

12.9.2 It is imperative that all air for combustion come from out-of-doors in environments of this nature, unless the equipment can be isolated from the contaminated atmosphere.

NOTE

NATIONAL GRID REQUESTS THAT ANY CUSTOMER WHO PLANS INSTALLATIONS IN THIS TYPE OF ATMOSPHERE CONTACT EQUIPMENT MANUFACTURER FOR TECHNICAL SUPPORT

CAUTION

The contractor is advised to become fully aware of the boiler control requirements as provided for in the latest revisions of ASME CSD-1 and New York State Code Rule 4. These documents may require additional safety controls over and above those required by this book or as furnished standard from the manufacturer for selected commercial, industrial and multi-family establishments.

12.10 GAS CONVERSIONS AND CONVERSION BURNER REQUIREMENTS

12.10.1 Conversion burners and associated equipment for gas conversions shall be installed according to the burner manufacturer's installation instructions, NFPA-54, FGCNYS and ANSI Z21.8.

12.10.2 When installing conversion equipment, the combustion chamber and flue passage ways of the existing appliance shall be thoroughly cleaned.

12.10.3 Conversion burner nozzle shall not extend into combustion chamber.

12.10.4 Combustion chamber shall be installed on dry-base boiler if upshot gas burner is not used.

12.10.5 Burners shall be adequately supported, i.e., burner legs shall be required, or burner shall be resting on a firm and level foundation, where applicable.

12.10.6 Burners shall be properly attached to boiler flange.

12.10.7 Unit shall be inspected and tested for gas tightness. All openings around the boiler base at floor level, doors and at gas entrance shall be properly sealed.

12.10.8 Unless otherwise specified by the burner manufacturer, always install a gas designed **double-acting** barometric draft regulator in the vent connector. Gas designed barometric draft regulators shall be installed according to manufacturer's installation instructions (power burner only).

A manual reset or single use type thermally actuated spill switch shall be installed on the double-acting barometric draft regulator. This switch is wired into the burner circuit to shut the gas off in case of a sustained back draft or blocked chimney condition.

12.10.9 Base of chimney shall be cleaned, and the chimney wire brushed from top to bottom. If not properly cleaned, oil residue left on the gas vent will dry out over time, flake off, and drop downward, possibly building up to cause a blocked chimney condition.

12.10.10 Vent connector shall be properly sized. Check the existing vent connector size against the proposed firing rate of the gas burner to determine if the vent connector is too big or small. Replace the vent connector if its size does not correspond with the vent tables in NFPA-54, FGCNYS.

12.10.11 Contractors are advised that gas conversion burners are not delivered adjusted for proper input and combustion air. Therefore, appropriate adjustments **shall be made** to ensure proper draft, proper CO readings and other items necessary for safe operation.

12.11 GAS FIREPLACES (VENTED DECORATIVE GAS APPLIANCES)

12.11.1 In all cases, these appliances shall be installed according to applicable state codes, the manufacturer's installation instructions and other specific conditions of approval.

12.11.2 Existing masonry fireplace flues must first be investigated and determined to be adequate, unobstructed, and with no upper-story openings or connections. All applicable clearances, air for combustion and ventilation requirements shall be observed.

12.11.3 Approved factory-built fireplaces, where installed indoors, must be vented through an approved Type B vent or lined chimney. All applicable clearances, air for combustion and ventilation requirements shall be observed.

12.12 ILLUMINATING DEVICES

12.12.1 All gas lights shall be listed by the **CSA, UL** or other qualified technical listing organization. Gas lights shall be installed according to their listings, all local codes, National Grid requirements and the manufacturer's installation instructions.

- 12.12.2 Gas pressure regulators (where required) shall be installed for all illuminating appliances.
- 12.12.3 Gas lamps designed for post mounting shall be securely and rigidly attached to a post.
- 12.12.4 Adequate concrete shall be used around the base of the supporting lamp post and underground piping shall not be embedded in post concrete.
- 12.12.5 A shutoff valve shall be installed on the line to the gas light at the point where it connects to the house riser and shall be in an accessible location.
- 12.12.6 Where permitted by local authorities having jurisdiction, outdoor gas torches, used to symbolize some event or to adorn landmarks, entrances, etc., may be installed. These devices often require high gas inputs, and therefore, the contractor/customer shall proceed with caution. National Grid shall be consulted on all such installations.
- 12.12.7 New pedestals for gas torches shall be supported by an adequate concrete base. Gas pipe shall not be embedded in this base. Existing columns, which are used to support gas torches, may encase inlet gas piping subject to approval of the manner of connection by National Grid.
- 12.12.8 No gas torch flame shall be less than 7' above the immediate ground level.

12.13 NATURAL GAS COMBUSTION ENGINES

Natural gas-fired combustion engines are generally utilized for engine-driven air conditioning, cogeneration, heat pump, generators and other gas engine driven applications. National Grid is to be consulted regarding any proposed installations. All installations shall be performed according to the manufacturer's installation instructions, New York State Codes and NFPA-37. National Grid shall be consulted prior to proceeding with any plans to install natural gas combustion engines.

12.14 COMPRESSED NATURAL GAS (CNG) STATIONS

Compressed Natural Gas (CNG) stations shall not be planned without consultation with National Grid.

12.15 UNVENTED ROOM HEATERS

Unvented room heaters shall be tested in accordance with ANSI Z21.11.2 and shall be installed in accordance with NFPA 54, FGCNYS, and the manufacturer's installation instructions. They may not be used as the primary heat source. Unvented room heaters must be equipped with an oxygen depletion sensor safety shutoff system.

12.16 OTHER EQUIPMENT

Any gas utilization equipment not covered in this manual shall be installed according to the National Fuel Gas Code, FGCNYS, **and local codes**. National Grid shall be consulted for further guidance on any equipment not covered in this book.

12.17 COMBO WATER HEATERS

Water heaters utilized both to supply potable hot water and provide hot water for space heating applications shall be listed and labeled for such applications by the manufacturer and shall be installed in accordance with the manufacturers installation instructions.

APPENDIX A

For questions about your gas design call Planner at 315-452-7517
To become a qualified installer call Eamon Massett 460-4393
To arrange pickup of materials call Planner at 315-452-7517
For inspection of your trench call Robert Sanguine m-(315)546-3348 o-315-452-7582
To schedule the National Grid crew to tie your service to the gas main call 452-7610
To schedule a meter set and activation call Customer Service at 1-800-642-4272



Standard For Company Owned/Customer Installed Underground Gas Piping

**Please bring a photo I.D. when you go to our training
facility**

National Grid Service Request Number:

National Grid Contact Name:

National Grid Contact Phone Number:

Service Size:

Service Length:

Section 1

GENERAL

1.1 Introduction

National Grid is committed to providing you with safe reliable gas service. This is already done by the installation specifications and maintenance requirements by which we supply gas to you up to your gas meter. Another part of this commitment includes assisting the customers with an option to install their own National Grid service line. In the construction of new gas facilities, there may be situations where the customer opts to construct a portion of the service line when economics or other factors are involved.

The purpose of this booklet is to provide you with information that you will need if you plan to construct your National Grid underground service line.

1.2 Scope

This standard applies to a gas service line (as defined by Department of Transportation-Title 49, Part 192 and New York State Codes, Rules and Regulations-Title 16, Part 255) that is partially installed by the customer. Upon acceptance and pressurization, National Grid assumes the ownership of the entire service, including all operations, maintenance and replacement options. Because of this ownership, **National Grid will ensure all specifications and standards are strictly adhered to before the meter is set & the service is turned on. Any deficiencies MUST be corrected before this can occur.**

This standard applies to gas service line sizes of 1" CTS and 1 ¼" IPS , using coiled plastic pipe with mechanical stab type fittings. Any customer installed, National Grid owned, service line that does not meet the scope of this standard will require specific written guidance from National Grid.

1.3 Definitions

Gas Mains. Pipelines owned by National Grid, which are used to transport gas, in accordance with National Grid's tariff.

Law, Federal. Federal Dept. of Transportation (Office of Pipeline Safety) Title 49, Part 192.

Law, New York State New York State Codes, Rules and Regulations, Title 16, Part 255.

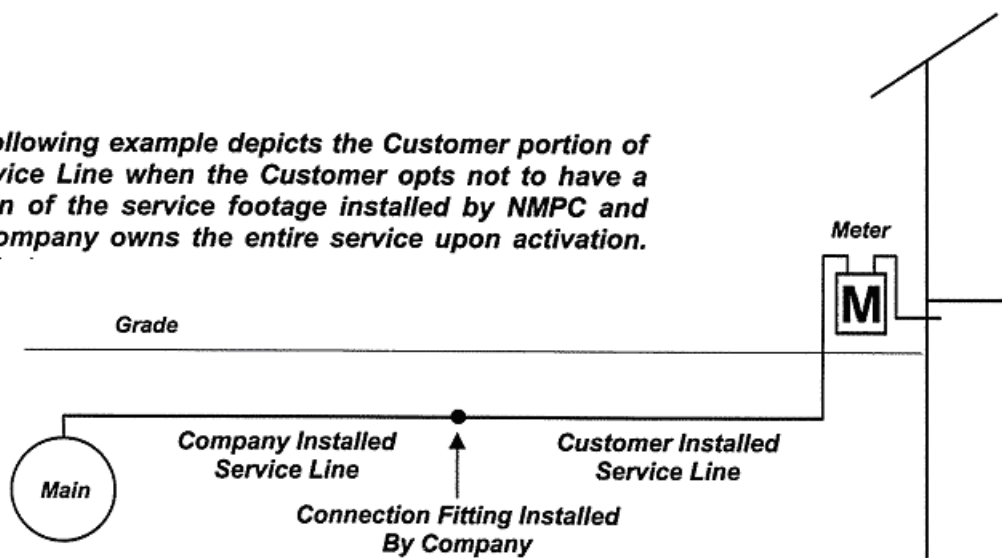
Pressure Test. Each gas line shall be tested with a calibrated gauge using air, water, or inert gas. The test Pressure and Duration can be found on the last page of this packet.

Mechanical Stab Type Connector. A pull out resistant coupling or cap with a steel insert matched to the wall thickness of the tubing and an "O" ring seal that seals on the outside of the tubing.

Service Line. New York State Rules and Regulations-Title 16, Part 230.1 (b) defines a service line as: “any underground piping, including associated metering and pressure reducing appurtenances, that transports gas below grade from a main to the first accessible fitting inside the wall of a customers building, when a meter is located within the building; if a meter is located outside the building, the service line will be deemed to terminate at the outside of the building foundation wall.”

Company Owned / Customer Installed Service Line

The following example depicts the Customer portion of a Service Line when the Customer opts not to have a portion of the service footage installed by NMPC and the Company owns the entire service upon activation.



Tariff. The regulated rates, charges and responsibilities that are defined by the New York State Public Service Commission, which constitute the company's rate base, and upon which National Grid must operate and adhere to as a regulated utility.

1.4 Construction Requirements

Customer installed service lines must be constructed per the standards and specifications set forth in this document. National Grid approved materials must be used.

1.5 Operating Pressure

Typically, a delivery pressure of 4" W.C. to 6 1/2" W.C. is supplied to the customer from the outlet of the meter. Should higher gas pressure be required due to equipment requirements, it will be supplied when available.

Should your equipment require a higher delivery pressure you must follow National Grid's Elevated Pressure Policy. Please advise the Customer Fulfillment Representative and they will provide you with a copy and explain the requirements.

1.6 Gas Metering and Regulation

National Grid will furnish and install gas metering equipment necessary for National Grid billing purposes. National Grid will also furnish and install, when required, the proper regulating equipment to govern the pressure under which gas is delivered. The applicant will provide a location on their premises suitable to National Grid for the installation of the metering and regulating equipment. Please refer to pages 12 and 13 and also the pages titled Vent Terminus for guidance. Regulators and/or meters, wherever practical shall be located outside. Any equipment or piping located outside the customer's building that could be subjected to hazardous conditions will require protection.

1.7 Customer Procedure Outline

Step 1 (Order Processing/ Customer Fulfillment) Prepares Gas Service Request (GSR)

Step 2 (Customer) Must sign the ***Customer Installation of Company Owned Service Line Written Agreement Form***.

Step 3 (Customer Fulfillment) CF performs a site review, measures the gas service lateral and identifies any estimated customer contribution required for gas service. CF Provides customer with the *Standard for Company Owned/Customer Installed Underground Gas Piping*.

Step 4 (Customer) Customer must provide Customer Fulfillment (National Grid contact) with the names of those who are going to make the plastic pipe joints/connections. These names will be checked against a Gas Technical Training list of people who are qualified to make plastic joints/connections for National Grid. If the person intended to perform the work is not qualified to make the plastic joint, they will be required to take a qualification test, given by Gas Technical Training. The National Grid contact will assist in scheduling this test. The contact name & number is on the front page of the document.

Step 5 (Customer) Make an appointment with your National Grid contact to pay and pick up materials. Complete the 'Gas Materials List' and bring a check for the amount calculated on the 'Gas Materials List' on page 19 and 20 of this document.

Notify National Grid when you plan to begin construction of customer-owned portion of gas service lateral so that National Grid can inspect the construction activities as appropriate. Should this date change, please call your National Grid contact to notify them of your new start date.

Step 6 (Customer) Customer or his authorized contractor (**MUST HAVE GREEN CARD AT TIME OF CONSTRUCTION AND INSPECTION**) constructs the customer installed portion of the service lateral including service riser, house bracket, locating wire and caution tape. Where possible, the surplus locating wire and caution tape will be left continuous for the Company to use in their portion of the service line construction. See Sections 2 & 3 of this document.

Step 7 (Customer) Install a mechanical stab-type cap (see 3.2 of this document for installation instructions) on open end of plastic pipe and perform a pressure test (see 2.4 of this document). The air test must be witnessed by the National Grid Inspector. Upon completion, the customer must complete the *Company Owned/Customer Installed Underground Gas Piping Compliance Certificate* form (page 18 of this document) After test, the threaded end of riser must be protected and the stab-type cap shall be left in place on end of plastic pipe.

Step 8 (Customer) Prior to inspection the Customer shall place only enough rock free backfill on the service to hold in place at the bottom of the trench. This will allow National Grid to inspect the trench depth , placement of wire and any connections required. Install locating wire along the side of the service The caution tape shall be placed in the trench 10" above service and 8" below final grade after the installation has been inspected. Call National Grid contact person for inspection when construction is complete.

Step 9 (Inspector) Will provide oversight of the customer constructed service line as required to ensure compliance with National Grid specifications. Collect and review, Customer's copy of the *Company Owned/Customer Installed Underground Gas Piping Compliance Certificate* form and ensure that all test requirements have been met. At the completion of the job, provide Gas Technical Training with an update of plastic joiners, to be entered into the qualified personnel database.

NOTE: Gas Service will not be initiated unless all specifications and standards are strictly adhered to before the meter is set & the service is turned on. Any deficiencies MUST be corrected before this can occur.

Step 10 (Gas Operations or designee)

- a. approves and accepts customer pipe.
- b. joins National Grid and customer-owned piping.
- c. installs customer surplus locating wire over remaining portion of the service lateral.
- d. installs shutoff and meter connection to service riser.
- e. performs pressure test for the entire service.
- f. energizes, purges, and locks off service.
- g. fills out Gas Service Card with a sketch including measurements depicting the location of the underground gas piping.

Step 11 (Customer) Finish backfilling trench. Connect fuel line to meter connection and appliance(s) to fuel line and contacts National Grid to request meter set. Call 1-800-932-0301.

- a) The Customer has 365 days to take service or they shall be billed the actual reasonable cost for the Company installed portion of the service lateral.

Step 12 (Service Department) Sets gas meter and activates service.

Section 2

CONSTRUCTION REQUIREMENTS

2.1 General Requirements

The following rules shall be observed when installing Company Owned/Customer Installed underground gas lines:

- a) Prior to digging near underground facilities, call **Dig Safely New York at (800) 962-7962** to request a mark out of any underground facilities that may be in your work site. **This call must be made at least two, but not more than ten working days before you begin excavation.**
- b) Each gas line requires a **shut off valve** that is accessible from outside the building. The gas shut off valve shall have a minimum clearance of at least twelve inches (12") above final grade after landscaping. (See Service Riser Installation Detail, page 12 of this document.)
- c) **Building entrances**, whenever possible, should be made above grade when connecting to piping inside the building.
- d) **Clearances** of at least 12 inches shall be maintained from any subsurface structures not directly associated with the gas line. Avoid interference with **foreign structures** such as water curb boxes, sewer vents, catch basins, manholes, water mains, buried telephone or electric lines.
- e) **Trenches** should not be dug closer than 3 feet to side lot lines, or underground telephone, electric, sewer and water lines when alternative routes are possible. Avoid crossing drain fields or septic tanks.
- f) **Avoid** installing underground gas piping beneath or through concrete pads, planters, piers, or pilasters. Also avoid locations through paved areas whenever possible.
- g) **Cover** Recommended depth of service shall be **24"** with a minimum of **18"**.
- h) **Support** each underground gas line on well compacted soil or a continuous support system, which has been designed to avoid harmful additional loading to the pipe. Shear point protection should be provided if conditions warrant.
- i) **Backfill** shall be sand or reused site material. Reused site material may contain rocks provided the rocks do not exceed 1" in diameter and have no sharp edges that could be harmful to the pipe. Sand padding around the pipe will be required when existing soil conditions are inadequate for pipe protection. (see Trench Detail, page 12 of this document.)
- j) **Protection** will be required for any equipment or piping located outside the customers building that could be subjected to hazardous conditions.
- k) **Padding** shall be sand or material below the pipe provided that rocks no greater than 1" and have no sharp edges that could be harmful to the pipe. Sand shall be placed below the pipe when existing soil conditions are inadequate for pipe protection

2.2 Materials

Due to Federal and State requirements, National Grid uses high-density polyethylene plastic pipe (made with 3408 base resin) in the construction of service lines. Customers opting to install a National Grid owned service line must use materials approved by National Grid. (See Tables 1-3 on pages 8-9).

2.3 Service Line Construction

Prior to backfilling National Grid is required, by law, to inspect the construction of all customer installed service lines. This inspection can be arranged through the Regional Distribution Design Representative listed on the front page.

Before the service can be pressurized, the customer needs to show assurance that all mandated construction requirements and material specifications were met. If needed, a National Grid Representative will review the list with you and explain any or all requirements in detail.

2.4 Service Line Inspection and Testing Requirements

Prior to backfilling National Grid must inspect the service line for the following:

1. All Federal and/or State Construction Regulations will be followed.
2. An air test was successfully performed at the prescribe pressure and duration listed on the chart in the back of this document. Service can be tested by attaching a 1" threaded tee onto the top of the riser, with a calibrated pressure gauge and air hose connector. After raising the pressure to the prescribed psi, shut off air supply and allow service to stabilize at the prescribed psi and maintain the prescribed pressure for the duration noted on the chart. Pressure gauge must indicate the prescribed psi for the full duration of the test to be acceptable.
3. National Grid approved materials were used.
4. A completed Gas Piping Compliance Certificate will be provided to National Grid at the time of inspection.

If the above requirements are met, the company will activate the service.

If the above requirements are not met, the company has the right to refuse or suspend service until remedial action is made by the customer to assure compliance to applicable National Grid and/or Part 255 Standards.

1.9 Materials

TABLE 1
1" CTS Installation

NATIONAL GRID SYMBOL NUMBER	ITEM DESCRIPTION
*9387638	SERVICE RISER, 1" CTS plastic, with .090" wall permasert coupling X 1", MPT, steel
*9312356	CAP, stab type permasert, 1" CTS plastic, with .090" wall insert
*9312527	BRACKET, for foundation mounting, with "U" bolt
*9310333	WIRE, locating, #12 AWG, single conductor, stranded copper, yellow, direct burial, 500' reel
*9315005	Tape, Caution, 6in X 1000ft
**9312076	TUBING, plastic, 1" CTS, PE 3408, .090 wall, 500 ft. coil
**9315605	COUPLING, plastic, 1" CTS, stab type, with .090" wall insert
9315380	Protection Sleeve

TABLE 2
1 1/4" IPS Installation

NATIONAL GRID SYMBOL NUMBER	ITEM DESCRIPTION
*9314071	SERVICE RISER, 1 1/4" IPS plastic, with SDR 11 permasert coupling X 1 1/4", MPT
*9307229	CAP, stab type permasert, 1 1/4" IPS plastic, with SDR 11 insert
*9315271	BRACKET, for foundation mounting, with "U" bolt
*9315005	WIRE, locating, #12 AWG, single conductor, stranded copper, yellow, direct burial, 500' reel
*9310333	Tape, Caution, 6in X 1000ft
**9314070	PIPE, plastic, 1 1/4" IPS, PE 3408, SDR 11, 500 ft. coil
**9314068	COUPLING, plastic, 1 1/4" IPS, stab type, with SDR 11 insert
9315380	Protection Sleeve

- supplied by National Grid
- ** purchased by customer

Section 3 POLYETHYLENE PLASTIC

3.1 Introduction

Due to Federal and State requirements, National Grid uses high-density polyethylene plastic pipe (type 3408 base resin) which meets ASTM D-2513.

3.2 Joining Methods

General Information

The joining of polyethylene shall be performed by individuals whose training and qualifications have been reviewed and approved by National Grid. No other methods than those described below are to be used in joining polyethylene plastics.

Mechanical Stab-Type Connectors

Approved mechanical stab-type connectors must be used for the joining of plastic pipe and tubing for underground gas lines. (see page 14 of this document for installation instructions)

Prior to installing these connectors:

1. the ends of the plastic pipe or tubing must be cleaned and chamfered, using the appropriate chamfering tool.
2. the manufacture's recommended stab depth shall be marked on the pipe or tubing using a permanent, contrasting color, marker.
3. all connections shall remain uncovered, **with visible stab depth marking**, for National Grid inspector.

3.3 Service Risers

Each polyethylene plastic pipe that terminates outside shall have a National Grid approved rigid metal gas tight service riser protection sleeve installed to provide protection for the plastic from physical damage above grade and shear stresses that develop below grade. Where required, an appropriate wall-mounting bracket shall be used. (See Riser Installation Detail)

3.4 Locator Wire

A locator wire must be installed with each direct burial polyethylene plastic line. This wire can be used to determine the location of the plastic piping at a future time. The minimum size locator wire should be a single conductor coated No. 12 AWG stranded copper.

The locator wire must be attached to the riser using electrical tape. The end of the wire must be brought above grade, looped and taped to the riser. (See Riser Installation Detail)

The wire must be located 6" within the plastic pipe. A space should be maintained between the wire and the plastic pipe so that any stray current picked up on the wire will not damage the plastic pipe. Do not tape wire to plastic service line. Only National Grid approved wire connectors are to be used.

3.5 Caution Tape

Caution tape must be installed on all open trench excavations at 10" above the service line. This will act as another warning system for any future excavations.

3.6 Damaged Plastic Pipe

Polyethylene plastic pipe, tubing and fittings shall be carefully inspected for cuts, scratches, gouges, or other harmful imperfections. This must be done before installation and again before backfilling.

3.7 Support Instructions for Polyethylene Plastic

Underground gas lines and terminations shall be properly supported at all points on undisturbed or well compacted soil.

Slack

Polyethylene plastic must be installed with sufficient slack so that thermal contraction or external loading will not place unnecessary stress or tensile pull on the piping, tubing or joints/connections.

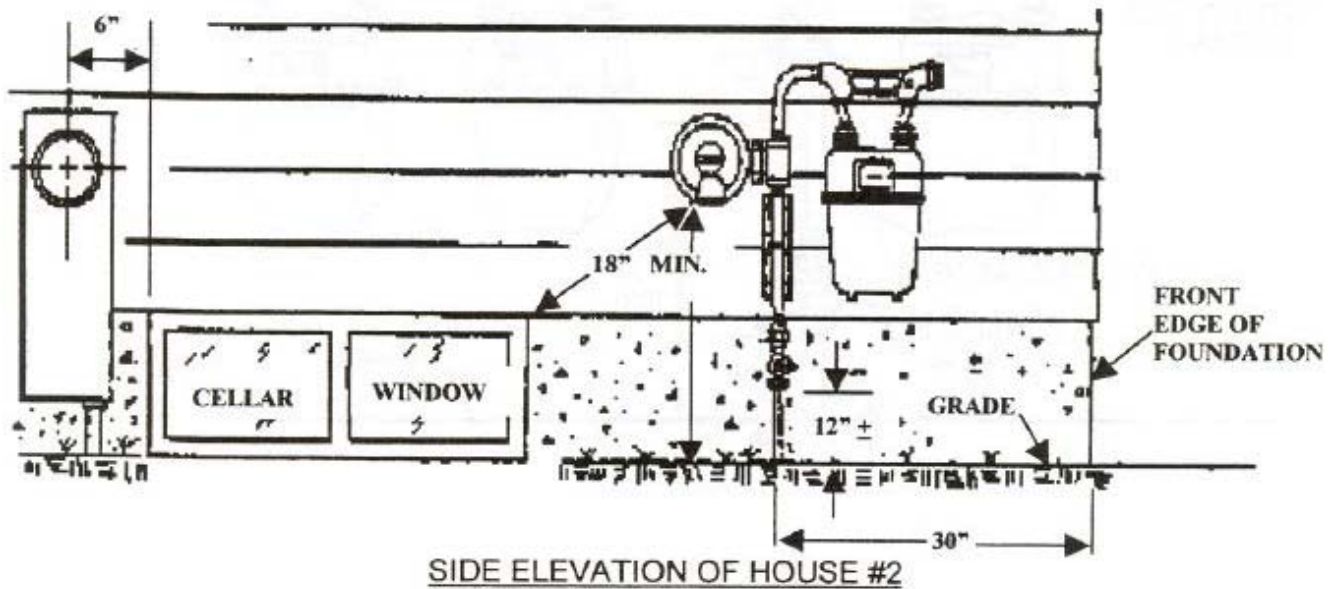
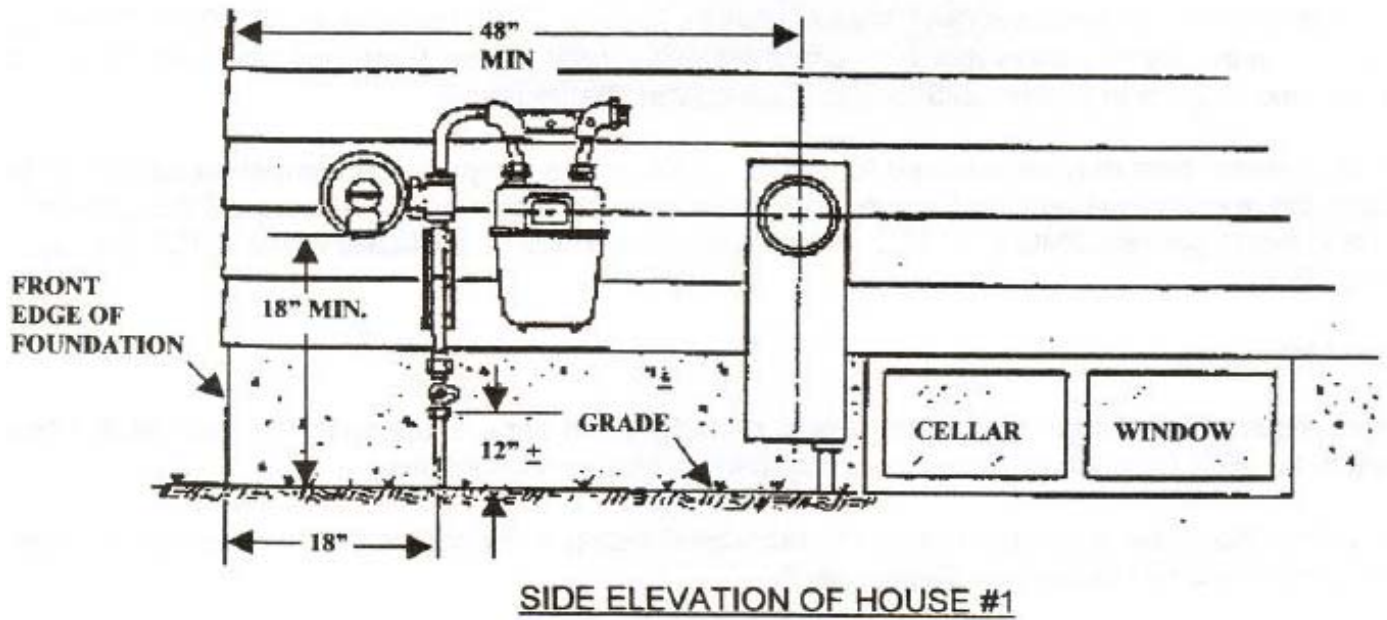
Shear Point Protection

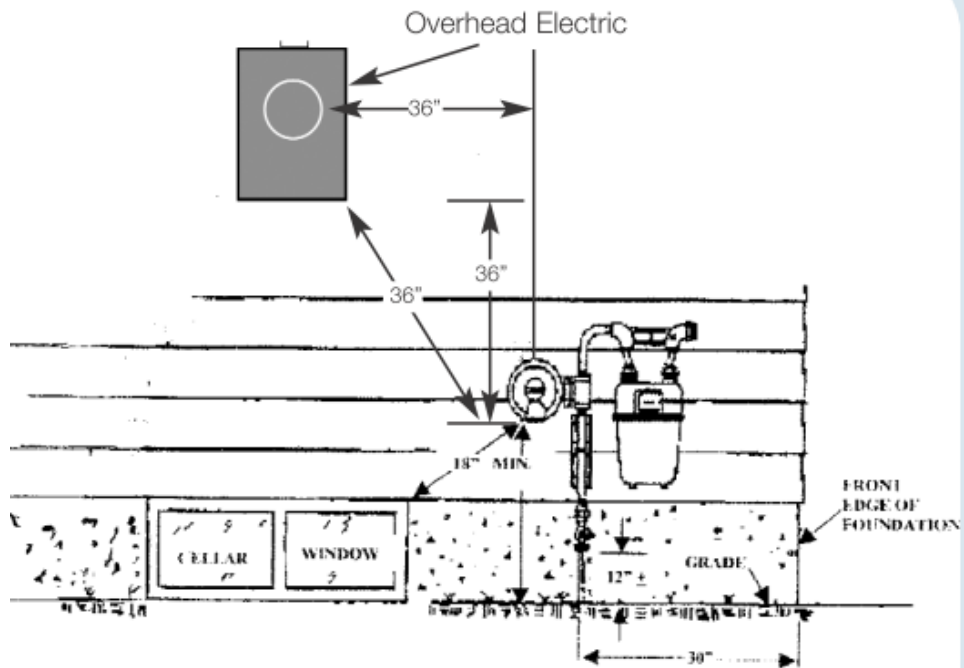
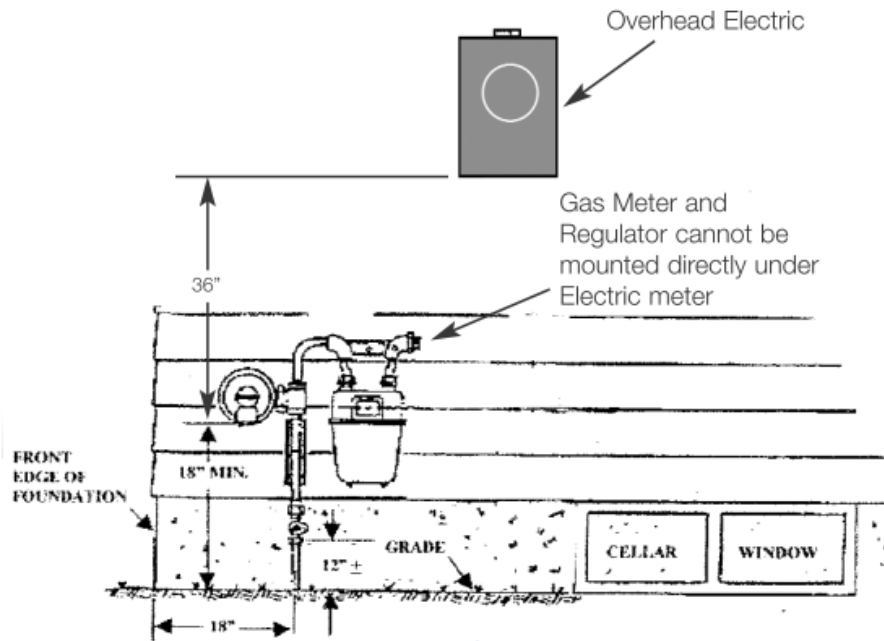
Protection is required at points subject to shear stress. These points may develop between different soil conditions such as undisturbed and excavated soil or at joints/connections between metal or plastic fittings and plastic tubing.

Insert Protection

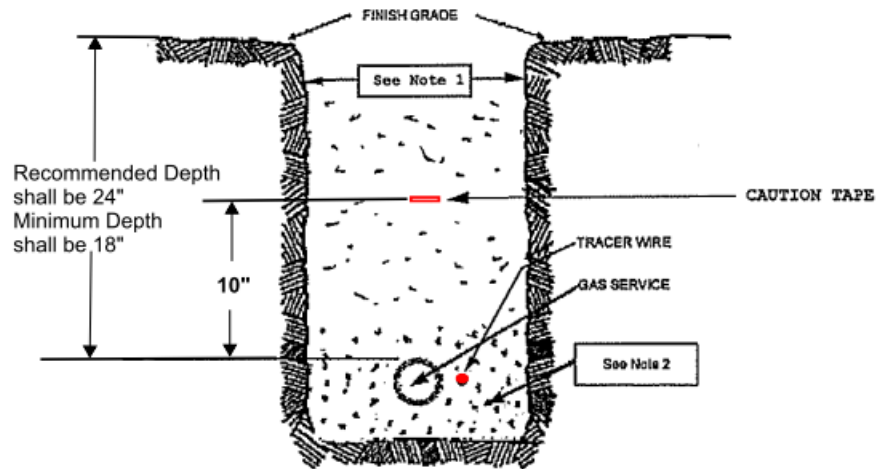
Whenever inserting polyethylene plastic through an existing metallic casing pipe, insert protection is required to protect the surface of the tubing against damage.

GAS METER LOCATIONS

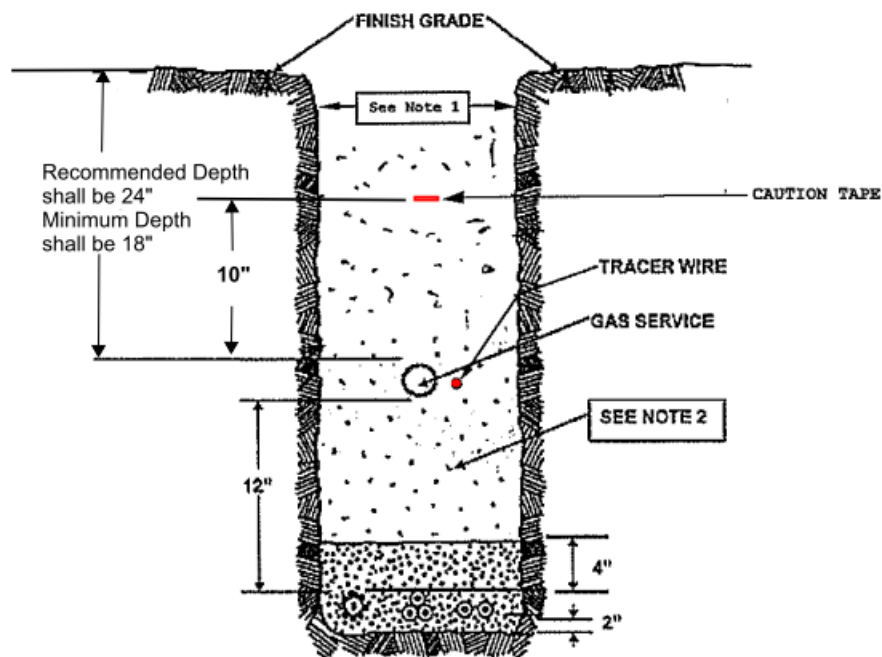




TYPICAL GAS ONLY SERVICE TRENCH DETAIL



TYPICAL JOINT TRENCH DETAIL

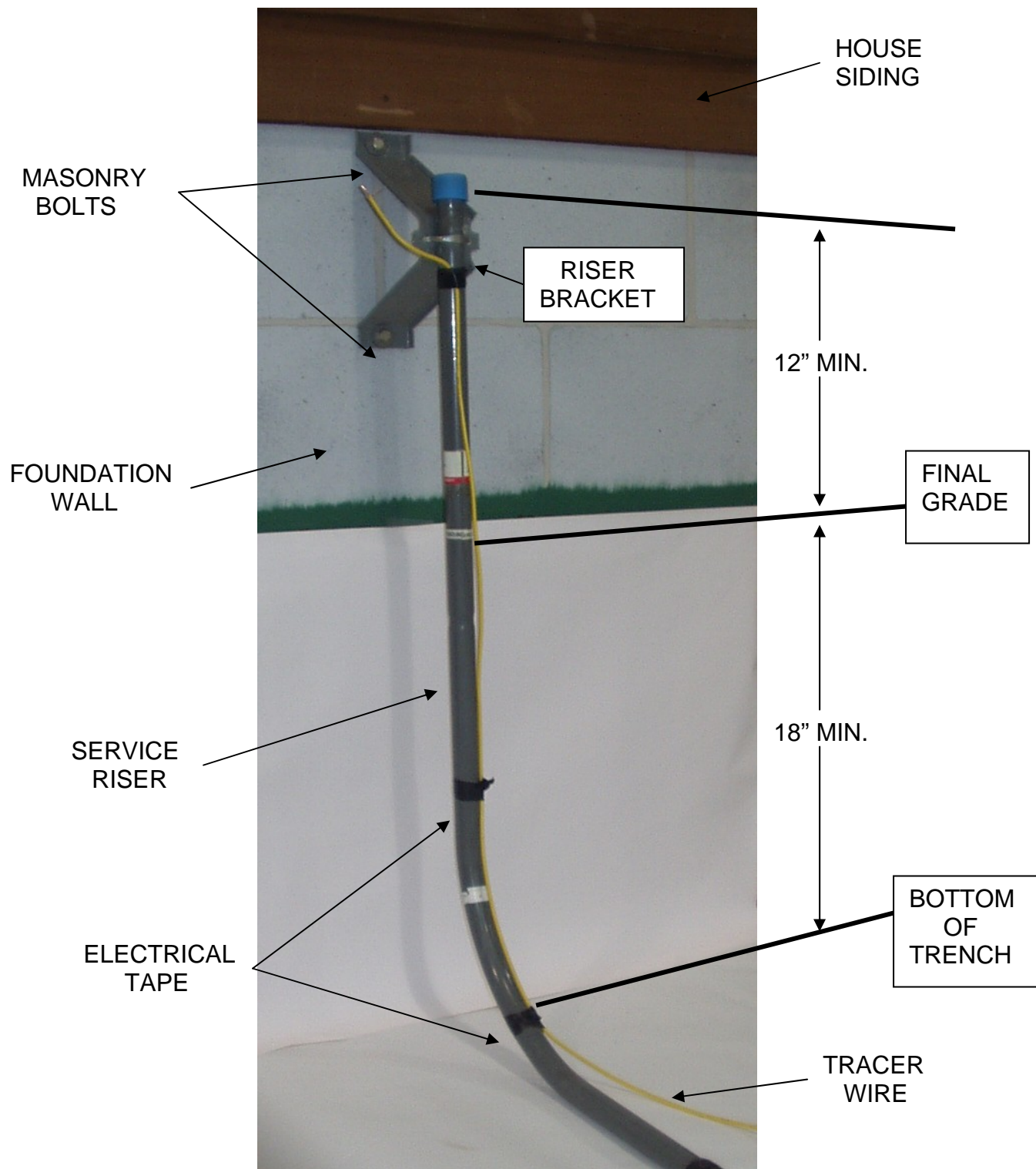


- ⚙ Nat. Grid Electric Primary Cable
- ⚙ Nat. Grid Electric secondary and/or Street Light Cable
- ⊗⊗ Communication Cable
- ⊗⊗ Sand or Rock-Free Sandy Loam (Clay shall not be acceptable. Site material may be reused if sand or rock free sandy loam.)

NOTE 1: TRENCH WIDTH TO BE KEPT TO A MINIMUM. 10" TO 12" PREFERRED

NOTE 2: BACKFILL MATERIAL SHALL BE SAND OR REUSED SITE MATERIAL.

REUSED SITE MATERIAL MAY CONTAIN ROCKS PROVIDED THE ROCKS DO NOT EXCEED 1" IN DIAMETER AND HAVE NO SHARP EDGES THAT COULD BE HARMFUL TO THE PIPE.



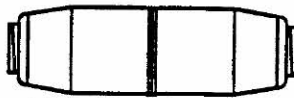
SERVICE RISER INSTALLATION DETAIL

POLYETHYLENE PLASTIC PIPE

NMGas Standards for Polyethylene Gas Piping

PLASTIC PIPE MATERIALS JOINING INSTRUCTIONS

Mechanical Stab-Type Coupling

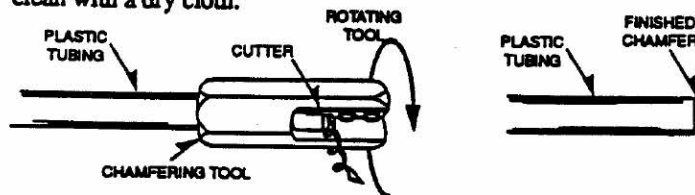


Installation Procedure

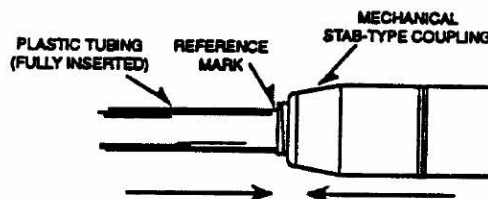
- 1) Squarely cut the end of the tubing to be inserted and wipe with a clean dry cloth. The tubing must be free of blemishes (cuts, gouges, scratches, etc.) and remain so to insure a satisfactory connection.

Note: Enough line slack should be provided to compensate for thermal contraction.

- 2) Chamfer the tubing end using the special chamfer tool. Wipe the tubing clean with a dry cloth.



- 3) Measure the distance from the nearest edge of the rolled fusion bead seam of the coupling to the end of the plastic body. This is shown as the reference mark on the illustration in Step 4. Mark the tubing at this distance back from the chamfered end. This mark will provide a reference line to assure that the coupling has been fully inserted.
- 4) Stab tubing fully into coupling to depth of mark. Tubing must bottom out in coupling. Do not twist tubing or coupling during insertion.



SECTION 5 REGIONAL INFORMATION

Important Telephone Numbers

- Contact Dig Safely New York, (1-800-962-7962) prior to digging near any underground facilities.
- National Grid provides 24-hour emergency service.
- The customer should immediately notify the Company of any suspected gas leaks. Notification can be made by calling the National Grid Gas Emergency number:

1-800-892-2345

For assistance or questions regarding this standard, please contact the specified National Grid contact on the cover of this document.

NATIONAL GRID GAS
COMPANY OWNED/CUSTOMER INSTALLED UNDERGROUND
GAS PIPING COMPLIANCE CERTIFICATE

CUSTOMER NAME: _____

ADDRESS: _____

PHONE: _____

The undersigned hereby certifies that the gas piping installation at the above address conforms to the following:

1. All piping materials, joining methods and installation procedures are in accordance National Grid specifications.
2. The piping has passed a pressure test, conducted at the prescribed pressure and duration noted on the chart in the back of this document, in accordance NYCRR Title 16 Part 255.

Contractor's/Customer's Signature: _____ Date: _____

PRESSURE TEST REPORT

Service Address: _____ City: _____

Tested at: _____ PSIG – for _____ Minutes/
Hours

Date: _____

Company Name: _____

Company Phone: _____

Signature: _____

(Print:) _____



GAS MATERIAL LIST

ISSUE NUMBER

CUSTOMER OWNED UNDERGROUND
GAS FUEL LINES – PLASTIC

STORE NUMBER

EFFECTIVE 8/15/05

Qualified person must present his/her "Plastic Joiner Qualification" card upon pick up of material. Without this card, no sale will be made.

*** TERMS OF PAYMENT ***						
<input type="checkbox"/> CASH <input type="checkbox"/> CHECK NO. _____ <input type="checkbox"/> CHARGE PO # _____						
Line	QTY	PRICE	UNIT	TOTAL COST	SYMBOL #	DESCRIPTION (FOR PLASTIC)
1		172.00	ROLL		9310250	Tubing, Plastic, 1" CTS Phillips (500' Reel) @ .344¢/ft.
2		279.55	ROLL		9314070	Pipe, Plastic, 1-1/4" IPS Phillips (500' Coil) @ .5591¢/ft.
3		10.25	EA		9315605	Coupling, Plastic, 1" CTS, Stab Type
4		34.79	EA		9314068	Coupling, Plastic, 1-1/4" IPS, Stab Type
5		14.50	EA		9315016	Ell, Plastic, 1" CTS, Stab Type
6		23.23	EA		9314768	Tee, Plastic, 1" CTS, 3 Way, Stab Type
7		9.72	EA		9306789	Cap, Plastic, 1" CTS, Stab Type
8		6.17	EA		9315380	Sleeve, Protection for Plastic 60" Long
9		0.34	EA		9312149	End Protection for 1" Sleeve
10		0.37	EA		9312377	End Protection for 1-1/2" Sleeve
11		40.25	EA		9387638	Sleeve Riser w/ 1" Plastic & 1" IPS Outlet with coupling
12		59.74	EA		9314071	Sleeve Riser w/ 1-1/4" Plastic & 1-1/4" IPS Outlet with coupling
13		13.10	EA		9312256	Valve, 1" Threaded
14		17.78	EA		9312270	Valve, 1" Threaded with Insulated End
15		30.60	EA		9314067	Valve, 1-1/4" Threaded with Insulated End
16		4.60	EA		9316030	Union, 1" Threaded
17		7.92	EA		9316027	Union, Insulated, 1" Threaded
18		50.20	ROLL		9315005	Wire, #12 Locator (500 ft. roll) @ .1004¢/ft.
19		7.61	EA		9320377	Putty, "Duxseal"
20		77.74	GAL		9310430	Primer, For Tape Pipe Wrap
21		17.25	ROLL		9315630	Tape, 2" Pipe Wrap (75 ft. roll) @ .23¢/ft.
22		13.23	EA		9315645	Anode, 3 lb. for Gas Line
23		17.52	EA		9315584	Tool, Chamfering for 1/2" & 1" Plastic Tube
24		23.92	EA		9314069	Tool, Chamfering for 1-1/4" Plastic Pipe
25			EA		9352841	Tool, Tubing Cutter 1/2" & 1" Plastic and 1-1/4" Plastic
SUBTOTAL (Page 1)				\$		

Line	QTY	PRICE	UNIT	TOTAL COST	SYMBOL #	DESCRIPTION (FOR PLASTIC)
26		3.90	EA		9312527	Support Brkt for 1/2", 1" & 1-1/4" Risers, "V" Shape w/U-Bolt
27		1.47	EA		9315439	Ell, 1" Threaded
28		2.30	EA		9315944	Tee, 1" Threaded
29		13.08	EA		9388398	1" Transition Fitting Plastic – Steel
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
SUBTOTAL (Page 2)				\$		

SUBTOTAL - PAGE 1.....\$ _____

SUBTOTAL - PAGE 2.....\$ _____

TOTAL.....\$ _____

*8.00 % NYS SALES TAX....\$ _____ or **TAX EXEMPT # _____

(*Tax based on Liverpool, NY – Please put in applicable tax for your area)

TOTAL COST.. ... \$ _____

Please make all checks payable to:

**National Grid
4651 Crossroads Park Dr.
Liverpool, NY 13088**

****IF CONTRACTOR IS TAX EXEMPT, YOU MUST SEND AN EXEMPT FORM WITH CHECK TO INVESTMENT RECOVERY***

***** PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE *****

SOLD TO: _____

ADDRESS: _____

PHONE: _____

CUSTOMER: _____

ADDRESS: _____

PHONE: _____

ORDER TAKEN BY: _____ EMPLOYEE #: _____ DATE: _____ TIME: _____
(NATIONAL GRID EMPLOYEE)

*****For any questions pertaining to the Plastic Joiner Qualification's or to obtain a card, please contact Eamon Massett 315-460-4393**

Customer Checklist

- ☐ Has your contractor been certified by National Grid to install pipe?
 - You need to have an approved annual National Grid green card certifying that the contractor can install the service line. If your contractor has not been certified, please contact Eamon Massett @ 315-460-4393 to schedule an appointment
 -

- ☐ Bring the attached '**Gas Materials List**' on page 17 and 18 of the Standard for Company Owned/Customer Installed Underground Gas Piping Packet along with a check for the totaled amount to the designated location by your National Grid Contact.
 - During your materials pick up, notify your National Grid representative of your start date.
 - Don't forget to bring:
 - o Green Qualification Card- Note: You must be certified annually.
 - o Sales Order #

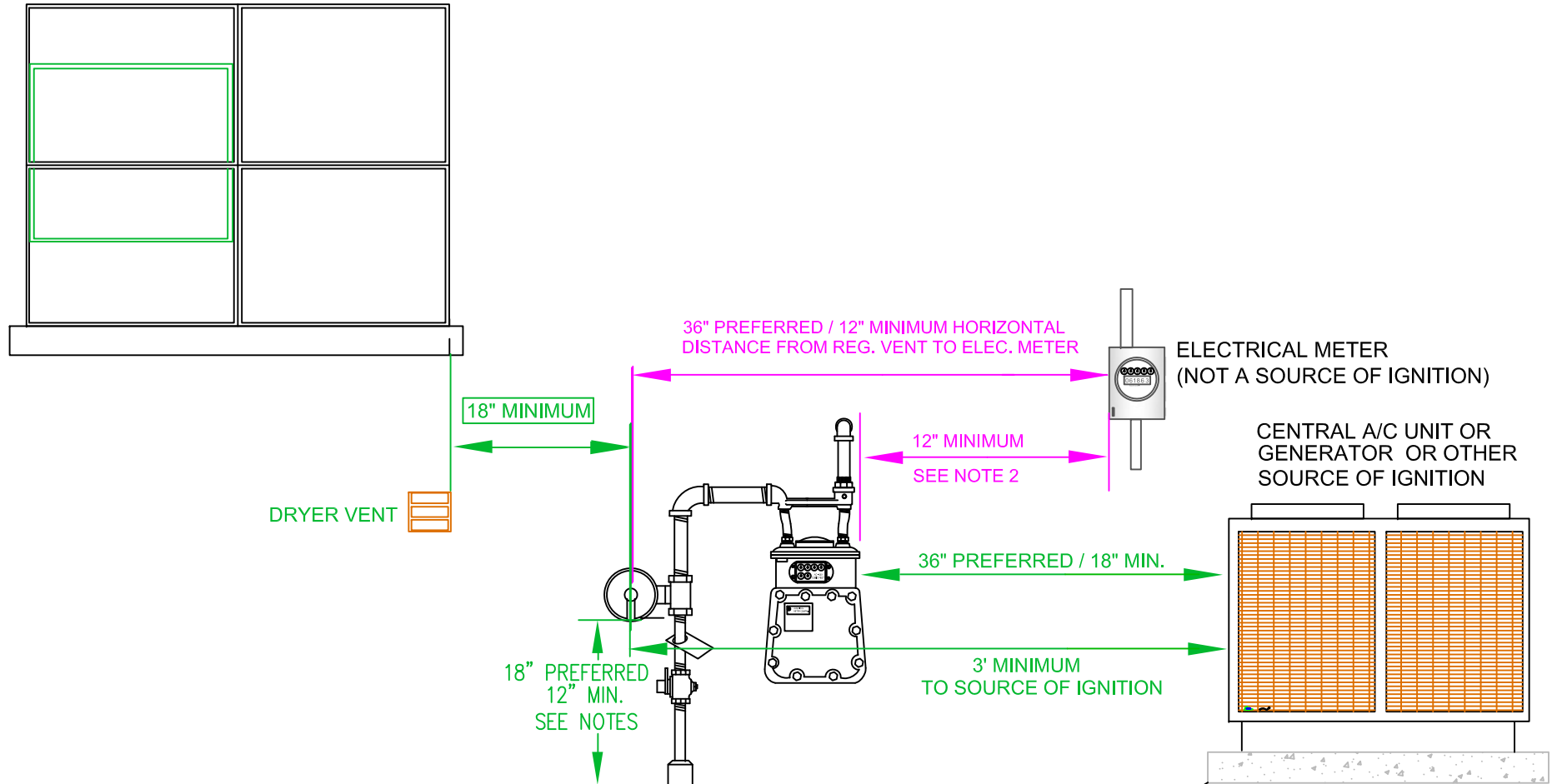
- ☐ Be sure to keep all joints/connections exposed after the service is installed and before partially backfilling the trench with at least 6" of rock free material.

- ☐ Once National Grid completed its portion of the gas service, connect your fuel line to any appliances you have installed. Then call 1-800-932-0301 to advise National Grid construction is complete.

Note: The Customer has 365 days to take service or they shall be billed the actual reasonable cost for the Company installed portion of the service lateral.

Please note that if the specifications in this publication are not met National Grid will not install their portion of the Gas Service

PREFERRED INSTALLATIONS:



nationalgrid

ALL REGIONS

OUTDOOR LOCATION FOR REGULATOR AND RELIEF VALVE VENT TERMINUS

Key Changes: ADDED GUIDELINES FOR FLOOD AREAS
ON PAGE 5 AND 6

DATE: 07/15/2010

DESIGN: PAUL GUGLIOTTA

DRAWN: PAUL GUGLIOTTA

EFFECTIVE DATE: 5/15/2016

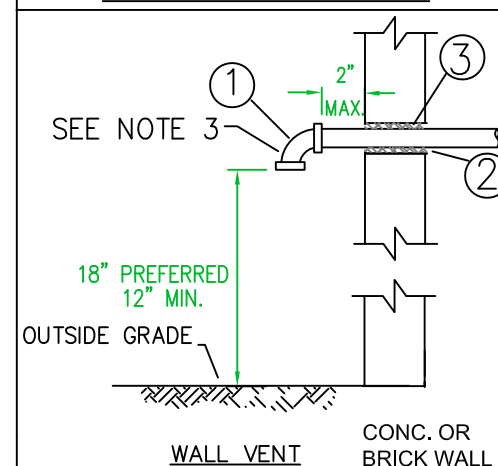
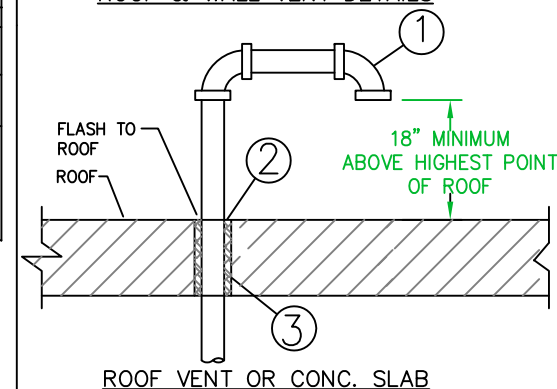
STD. DWG.

NO. 020013-CS

GUIDELINES FOR NON-PREFERRED INSTALLATIONS:

#	ITEM	SIZE	ITEM ID	
			L/NYC/MA	UNY / RI
3	PIPE SLEEVE		---	---
2	SEALING COMPOUND		9330862	NON STOCK
1	VENT ASSEMBLY, WITH RAIN & INSECT RESISTANT SCREEN	3/4"	9358637	NON STOCK
		1"	9358640	9315859
		1-1/4"	9358638	NON STOCK
		1-1/2"	9358641	NON STOCK
		2"	9358636	9310355

ROOF & WALL VENT DETAILS



SERVICE REGULATOR VENT RESTRICTIONS

NOTE: THIS 18" CLEARANCE FROM REGULATOR VENT TO WINDOW ONLY APPLIES TO OPERABLE WINDOWS. THIS RULE DOES NOT APPLY TO WINDOWS THAT CAN'T BE OPENED PER MFGR. DESIGN.

6' MINIMUM VERTICAL CLEARANCE FROM WINDOW

METER SETS LOCATED UNDER THE WINDOW SHOULD BE AVOIDED

SEE NOTE 7 AND PAGES 5&6 FOR VENTING PIPING FACING UP

18" MINIMUM

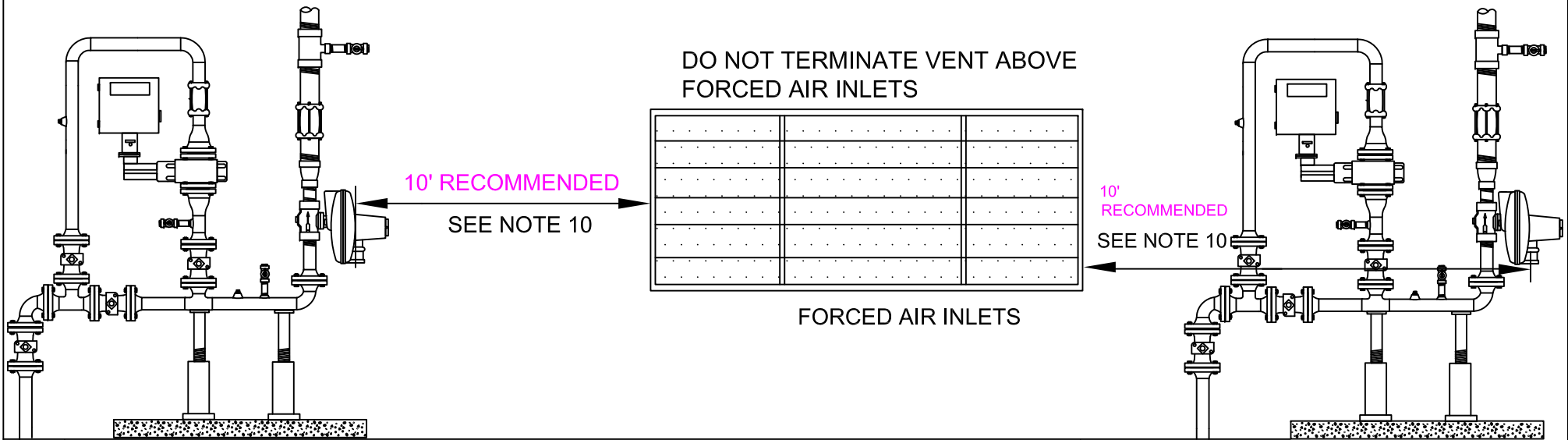
18" MINIMUM

18" PREFERRED
12" MIN.
SEE NOTES

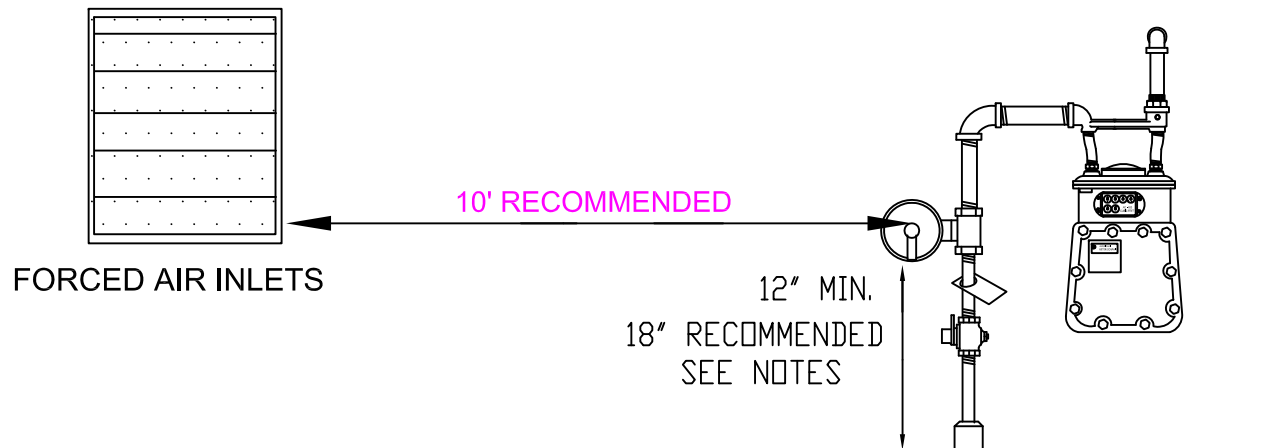
SEE NOTE 4 FOR VENT PIPING INSTALLATION

18" PREFERRED
12" MIN.
SEE NOTES

LARGE COMMERCIAL & INDUSTRIAL INSTALLATIONS



DO NOT TERMINATE VENT ABOVE
FORCED AIR INLETS



NOTES:

1. A REGULATOR VENT CANNOT BE LOCATED UNDER AN OVERHANG THAT CAN TRAP GAS SUCH AS A PITCHED AWNING WITH SIDES. A VENT MAY BE LOCATED UNDER A FLAT SURFACE HORIZONTAL OVERHANG UNDER 6' IN LENGTH AS LONG AS THE OVERHANG HAS NO OPENINGS INTO THE BUILDING WITHIN 18 INCHES OF THE VENT TERMINUS.
2. **A GAS METER** MUST HAVE A MINIMUM OF 12" HORIZONTAL CLEARANCE DISTANCE FROM A STANDARD ELECTRIC METER.
3. **THE GAS REGULATOR** VENT TERMINUS MUST:
 - HAVE A MINIMUM CLEARANCE OF 36" PREFERRED / 12" MINIMUM HORIZONTAL DISTANCE FROM A STANDARD ELECTRIC METER. IF THE REGULATOR IS WITHIN 36" OF THE ELECTRIC METER, THE VENT SHOULD BE PIPED AWAY FROM THE ELECTRIC METER.
4. THE OUTSIDE TERMINAL OF EACH SERVICE REGULATOR VENT MUST:
 - HAVE A RAIN AND INSECT RESISTANT SCREEN
 - BE LOCATED AT A PLACE WHERE ANY VENTING GAS CAN ESCAPE FREELY INTO ATMOSPHERE
 - BE AWAY FROM ANY WINDOWS, DOORS, SOFFIT VENTS OR ANY OPENINGS WHERE GAS CAN ENTER THE BUILDING. MAINTAIN A MINIMUM OF 18 INCHES HORIZONTAL CLEARANCE IF THAT OPENING IS WITHIN 6 FEET VERTICALLY OF THE VENT TERMINUS. **WINDOWS THAT ARE DESIGNED BY MANUFACTURER NOT TO OPEN ARE EXEMPT FROM THE 18 INCH RULE**
 - BE PROTECTED FROM DAMAGE WHERE ICE ACCUMULATION MAY OCCUR
 - IT IS PREFERRED THAT REGULATOR VENTS BE INSTALLED AT A HEIGHT 18 INCHES ABOVE GRADE, HOWEVER, THE MINIMUM ALLOWABLE VENT HEIGHT SHALL BE 12 INCHES ABOVE FINAL GRADE. IN CASES OF KNOWN FLOOD LOCATIONS, THE PREFERRED REGULATOR VENT HEIGHT ABOVE THE FLOOD HEIGHT IS 18" (12" MINIMUM).
5. THE METER ASSEMBLY SHALL BE LOCATED TO PREVENT DAMAGE BY VEHICLES AND MECHANICAL EQUIPMENT. WHERE THIS IS NOT PRACTICAL, ADDITIONAL PROTECTION SHALL BE INSTALLED. SEE MTRS-6060.
6. GALVANIZED PIPE AND FITTINGS FOR VENT PIPING IS PREFERRED (REQUIRED ON L.I.) PROPERLY COATED BLACK IRON PIPE IS PERMITTED.
7. IF A VENT NEEDS TO BE EXTENDED, STRAIGHT PIPING IS PREFERRED, BUT IF NOT PRACTICAL, A VENT LINE "TRAP" IS ACCEPTABLE.
 - ON OUTSIDE METER SETS, AN INSULATED UNION (LI) OR INSULATED COUPLING (NY) IS PREFERRED ON ALL VENT LINES UNDER 3' AND REQUIRED ON ALL VENT LINES > 3'.
 - ON **ALL** INSIDE SETS, AN INSULATING UNION OR INSULATED COUPLING IS REQUIRED ON THE VENT PIPING. THIS INSULATED UNION OR INSULATED COUPLING SHALL BE LOCATED AS CLOSE TO THE REGULATOR AS POSSIBLE.
8. IT IS PREFERRED THAT THE METER AND RISER NOT BE LOCATED UNDER A WINDOW.
9. VENT LINES SHOULD BE INSTALLED ABOVE GRADE. BELOW GRADE VENT LINES SHOULD BE AVOIDED. HOWEVER, WHERE IT IS NOT POSSIBLE, VENT LINES INSTALLED UNDERGROUND SHALL BE PROTECTED FROM CORRODING. THIS INCLUDES WRAPPING THE ENTIRE LINE WITH APPROVED COATING 030031-CS, INSTALLING A 3 LB BAG ANODE (ITEM ID 9339401) (OR LARGER) AND INSTALLING AN INSULATING FITTING BETWEEN THE REGULATOR AND THE BELOW GRADE SECTION (TYPICALLY INSIDE THE BUILDING). **ANY NEW VENT LINE THAT PASSES THROUGH A CONCRETE OR MASONRY WALL OR FOUNDATION, SHALL BE SLEEVED AND THE ANNULAR SPACE SHALL BE SEALED TO PREVENT WATER INTRUSION.** FOR SITUATIONS THAT ARE NOT COVERED BY THE PROVISIONS OF THIS STANDARD, CONTACT GAS ENGINEERING.
10. ON LARGE RESIDENTIAL, COMMERCIAL & INDUSTRIAL SETS WHERE LARGE FORCED AIR INTAKE SYSTEMS ARE PRESENT, ENGINEERING APPROVAL IS REQUIRED FOR REGULATOR/RELIEF VALVE TERMINATION POINTS.
11. ON EXISTING INSTALLATIONS WHERE UNDERGROUND VENT LINE IS FOUND, THE VENT LINE SHOULD BE RELOCATED ABOVE GROUND. IF THIS IS NOT POSSIBLE, IT MUST BE PRESSURE TESTED AT 3 PSIG AND INSPECTED FOR CORROSION. IF IT PASSES THE PRESSURE TEST AND THE PIPE IS VISUALLY ACCEPTABLE, IT THEN SHALL BE CATHOLICALLY PROTECTED PER 030031-CS AND BROUGHT IN TO COMPLIANCE AS DESCRIBED IN NOTE 9.

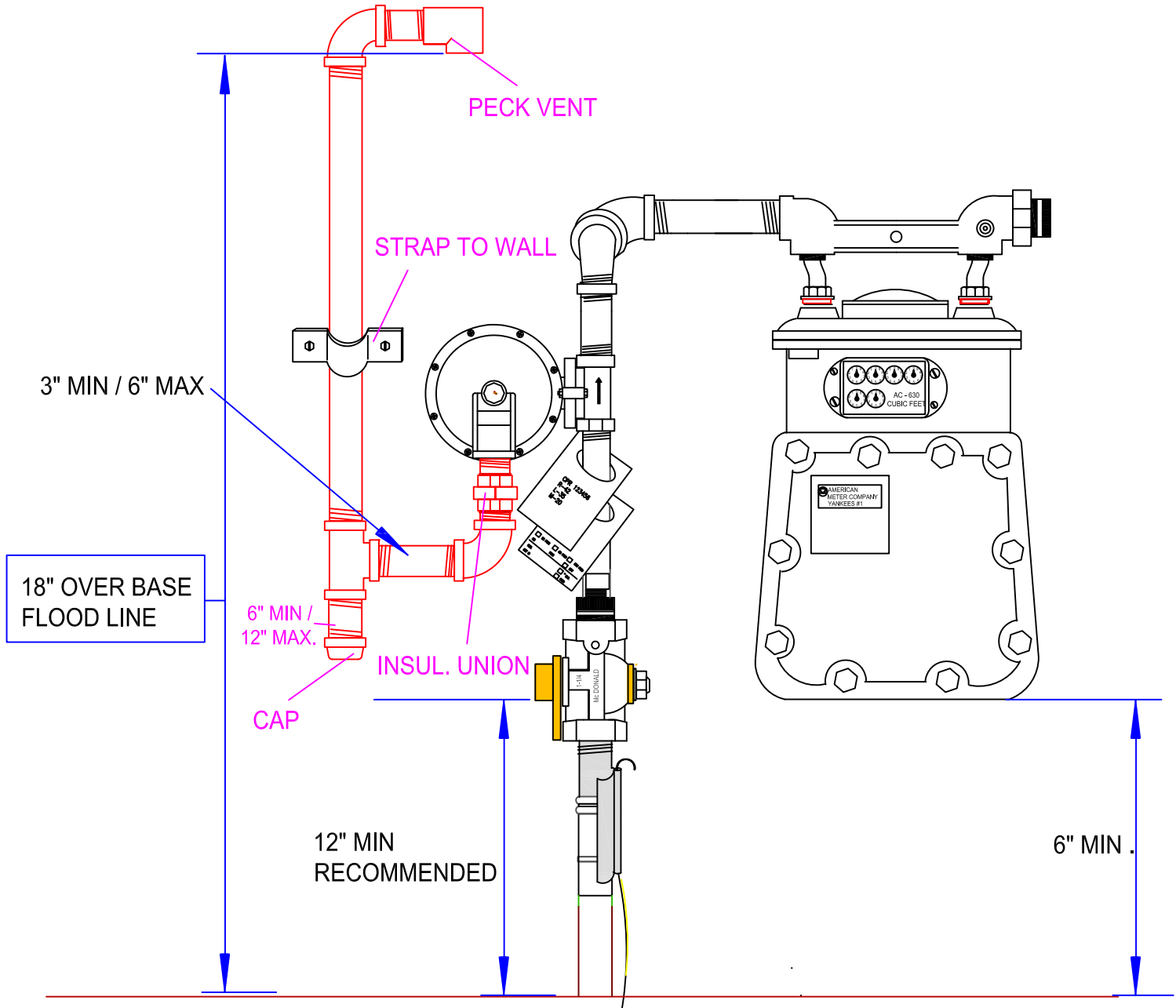
CLEARANCE GUIDELINES:

SITUATION	MINIMUM DISTANCE
STANDARD ELECTRIC METER	12 INCHES HORIZONTAL DISTANCE FROM GAS METER TO ELECTRIC METER 36 INCHES PREFERRED / 12 INCHES MIN. DISTANCE FROM REGULATOR VENT TERMINUS TO ELECTRIC METER
IGNITION SOURCE	36 INCHES RECOMMENDED / 18 INCHES MINIMUM FROM GAS METER AND 36 INCHES MINIMUM DISTANCE FROM REGULATOR VENT TERMINUS TO SOURCE OF IGNITION
WINDOW, DOOR, SOFFIT VENT, OTHER OPENINGS INTO BUILDING	18 INCHES HORIZONTAL AND 6 FEET VERTICAL (WHERE PRACTICAL) FROM REGULATOR VENT TERMINUS
VENT TERMINUS UNDER FLAT OVERHANG	IF OVERHANG PROTRUDING LESS THAN 6 FEET VENT TERMINUS IS ACCEPTABLE UNDER OVERHANG.
CENTRAL A/C UNIT	36 INCHES PREFERRED / 18 FEET MINIMUM FROM GAS METER 36" FROM REGULATOR VENT TERMINUS
VENT TERMINUS UNDER AWNING/CANOPY WITH SIDES ENCLOSED	18 INCHES HORIZONTAL
FORCED AIR INTAKE LARGE RESIDENTIAL, COMMERCIAL OR INDUSTRIAL	REQUIRES ENGINEERING APPROVAL
VENT TERMINUS CLEARANCE ABOVE FINAL GRADE	18 INCHES PREFERRED / 12 INCHES MINIMUM
VENT TERMINUS CLEARANCE ABOVE KNOWN FLOOD LINE	18 INCHES PREFERRED / 12 INCHES MINIMUM
VENT TERMINUS TO A CATEGORY 1 DIRECT VENT HEATERS	3 FEET FROM INTAKE OR EXHAUST OR PER MFG. SPECS. WHICHEVER IS GREATER
VENT TERMINUS TO SEWER VENT	18 INCHES RECOMMENDED

RECOMMENDED VENT LINE EXTENSION IN FLOOD AREAS

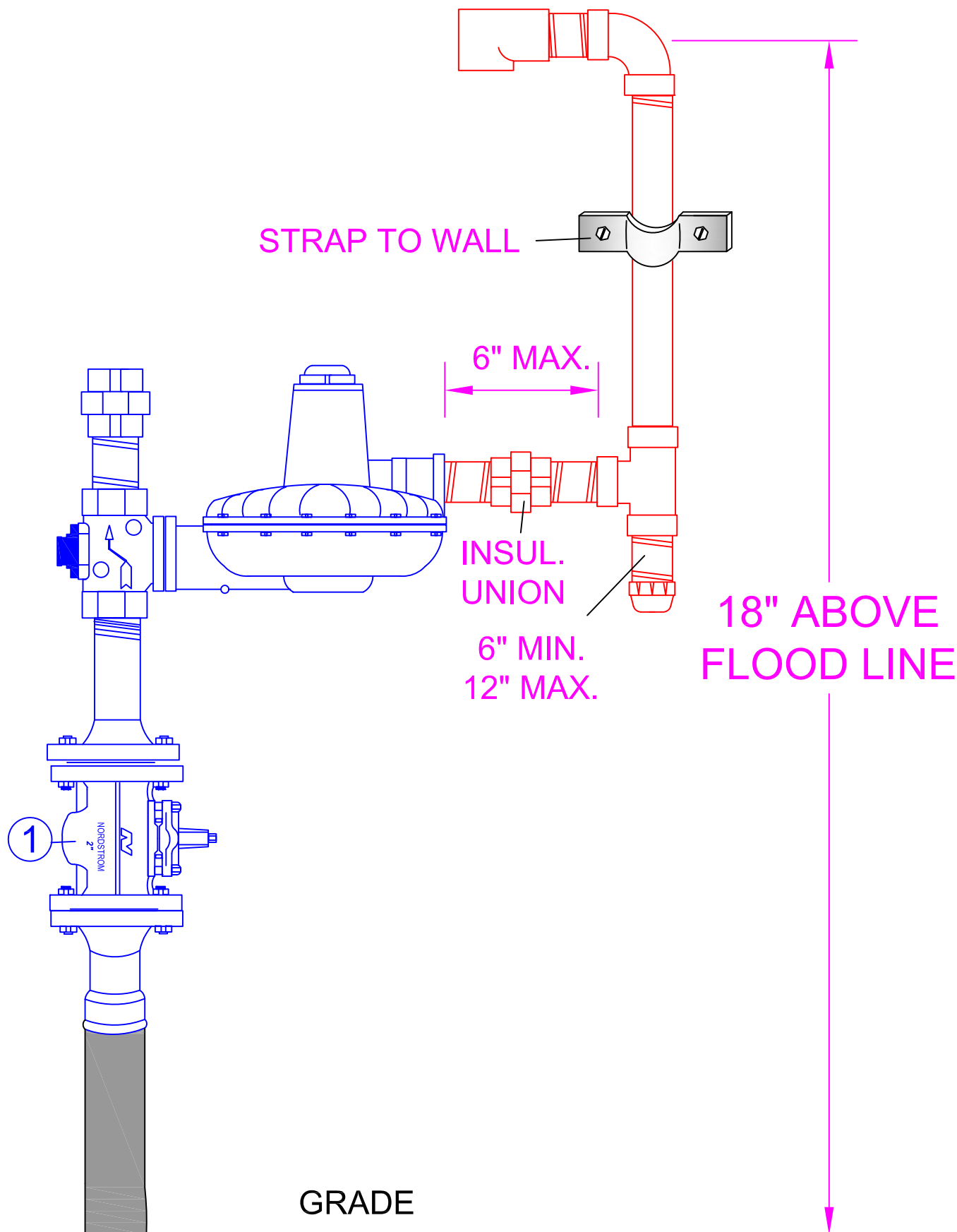
NOTES:

1. VENT LINE MUST BE GAS TIGHT. USE APPROPRIATE THREAD SEALANT.
2. PLACING THE REGULATOR VENT IN THE UP POSITION AND RUNNING THE VENT LINE STRAIGHT UP CAN CAUSE WATER AND ICE TO ACCUMULATE INSIDE THE REGULATOR. THE CONFIGURATION SHOWN HERE MINIMIZES THE CHANCE OF WATER INSIDE THE REGULATOR
3. USE GALVANIZED PIPE AND FITTINGS IN LONG ISLAND.
4. INSULATING DRESSER STYLE 90 CAN BE USED IN LIEU OF INSUL. UNION.



nationalgrid ALL REGIONS		RECOMMENDED VENT LINE EXTENSION IN FLOOD AREAS	
REVISIONS: NEW STANDARD		DATE: 05/15/2016 DESIGN: PAUL GUGLIOTTA DRAWN: PAUL GUGLIOTTA	EFFECTIVE DATE: 05/15/2016 STD. DWG. NO. 020013-CS

FOR HORIZONTAL VENT OUTLETS



APPENDIX B

Standards For Customer Owned/Installed Underground Gas Piping

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Section 1

GENERAL

1.1 Introduction

National Grid is committed to providing you with safe reliable gas service. This is already done by the installation specifications and maintenance requirements by which we supply gas to you up to your gas meter. Another part of this commitment includes assisting you with the installation of gas lines that you, as a customer/contractor, may install to make use of our product.

The purpose of this booklet is to provide you with information that you will need if you plan to construct your own underground gas piping. Please remember that whenever you plan to install any underground gas line, we are here to help you. We would prefer that you use the same materials that we use so that in the event of a leak, break or other damage on your privately owned underground piping, we can assist you in the maintenance and repair of your gas line. Additionally, if we know where your buried gas lines are, we will survey them for leaks on a regularly scheduled basis --- free of charge.

A vital part of providing this service to you is to help you understanding of the two classifications of underground gas piping (as defined by the Federal Government and New York State) that you might utilize to supply gas to various outside appliances, equipment or other buildings or structures on your property. These two classifications are underground **service line** and underground **yard line** and they will be explained in the following sections.

1.2 Definitions

Anode. Used in metallic pipe protection (typically magnesium).

Cathodic Protection. Corrosion protection through electrolysis.

Gas Mains. Pipelines owned by National Grid, which are used to transport gas, in accordance with National Grid's tariff.

Habitable. Where residential, commercial, educational or public occupancy can be reasonably expected for significant daily time periods-

Insulated Coupling. Used to electrically separate metallic pipe.

Law, Federal. Federal Dept. of Transportation (Office of Pipeline Safety) Part 192.

Law, New York State. Title 16 New York Commission of Rules and Regulations.

Meter House. A structure built solely to house gas metering equipment. Underground gas lines exiting a meter house are still considered service lines to habitable buildings. New York State does not consider a meter house to be a building, but simply a cover over a meter.

NACE. National Association of Corrosion Engineers.

NFPA 54. National Fire Protection Association (NFPA) designation for the National Fuel Gas Code. The American National Standards Institute (ANSI) designation is Z223.1. This Code (NFPA 54 / ANSI Z223.1) is revised every four years. Current edition is 1996.

Pressure Test. Each gas line shall be tested with a calibrated gauge using air, water, or inert gas. The test for **service lines** shall be at 90 psig for a minimum of 15 minutes.

Yard lines shall be tested at 1.5 times the maximum operating pressure, but not less than 3 psig for 30 minutes per 500 cu.ft. of pipe volume (NFPA 54, Part 4).

Restraint Coupling. Pull out resistant (required on all plastic pipe).

Service Line. New York State Rules and Regulations, Title 16, Part 230.1 (b) defines a service line as: "any underground piping, including associated metering and pressure reducing appurtenances, that transports gas below grade from a main to the first accessible fitting inside the wall of a customer's building, when a meter is located within the building; if a meter is located outside the building, the service line will be deemed to terminate at the outside of the building foundation wall."

In the construction of new residential gas facilities, National Grid reserves the exclusive right to install the first 100 feet of gas service line between the gas main and the gas meter. But there may be situations beyond the first 100 feet of service line, or beyond the meter, where the customer may opt to construct a portion of their own service line because that portion may be considered to be "excess" by National Grid tariff, and subject to charges by National Grid.

These underground lines between outside meter installations or meter houses and habitable buildings are considered service lines. (examples 1 - 4, pg. 12 & 13)

Service Lines, Customer Owned. Service lines constructed under the direction of, or on behalf of, the property or business owner. Even though these service lines are considered to be customer owned, National Grid is still held responsible by law for the inspection and maintenance of these service lines. Maintenance is defined as a periodic survey for leaks as required by New York State Rules and Regulations, and the monitoring for corrosion if the service is metallic. If an unsafe condition is found, National Grid may shut off the flow of gas and inform the customer of the unsafe condition, or possibly repair the unsafe condition in certain cases.

Tariff. The regulated rates, charges and responsibilities that are defined by the New York State Public Service Commission, which constitute the company's rate base, and upon which National Grid must operate and adhere to as a regulated utility.

Meter House. A structure built solely to house gas metering equipment. Underground gas lines exiting a meter house are still considered service lines to habitable buildings. New York State does not consider a meter house to be a building, but simply a cover over a meter.

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Tariff. The regulated rates, charges and responsibilities that are defined by the New York State Public Service Commission, which constitute the company's rate base, and upon which National Grid must operate and adhere to as a regulated utility.

Transition Fitting. Factory assembled fitting to adapt plastic to steel.

Warning Tag. A notification procedure designed to make customers aware of hazardous conditions relating to their gas appliances and piping installations.

Yard Line. Defined as an underground gas line that exits a natural gas customer's building to supply gas to another structure or outside gas appliance.

NOTE: Underground gas lines exiting a meter house (built solely to house gas metering equipment) are still considered service lines to habitable buildings. New York State does not consider a meter house to be a building, but simply a cover over a meter

- OR -

An underground gas line that originates as a branch connection from an outside meter installation and supplies a secondary outside gas appliance such as a pool heater, gas light or gas grill.

- OR -

An underground gas line that originates as a branch connection from an outside meter installation and supplies a building or structure that is not habitable (garage, storage facility, shed, etc.), Unless that structure is the first and only user of gas when the meter is installed. (examples 1 - 4, pg. 12 & 13)

Yard Lines, Customer Owned. Yard lines constructed under the direction of, or on behalf of, the property or business owner.

1.3 Responsibilities

The customer has the responsibility to maintain their gas piping and equipment in a safe and operating condition.

Gas appliances and accessories shall comply with applicable ANSI, AGA, UL, Inchcape, or Warnock - Heresy requirements regarding safe operation and acceptable performance. National Grid has a "warning tag" procedure to make customers aware of hazardous conditions relating to piping installations and gas appliances. It is the customer's responsibility to correct such deficiencies.

The company reserves the right to withhold gas service or discontinue service whenever the customer's piping or equipment is deemed unsafe or inadequate for receiving natural gas.

When the deficiencies have been corrected, National Grid will inspect and verify that the corrections have been completed, gas service will be restored.

The customer is responsible for assuring qualified contractors install, repair or replace any segment of the gas piping beyond the outlet of the meter.

National Grid must assure that the customer's underground installations conform to appropriate Federal and State regulations (NYCRR, Title 16, Part 255 and/or NFPA 54).

National Grid will inspect and verify that the work has been completed in accordance with all applicable rules and regulations and report any deficiencies to the customer.

Prior to the line being placed in service, the customer is required to provide the National Grid with an accurate drawing showing the location of underground gas piping beyond the outlet of the meter. (An example of what is required on the drawing can be found on page 22 of this document.) Service line installations will also require a completed Gas Piping Compliance Certificate (see section 2.4). Gas leak surveys will be performed by National Grid as required by Federal and New York State safety codes.

1.4 Operating Pressure

Typically, low pressure (4" W.C. to 6 1/2" W.C.) is supplied to the customer from the outlet of the meter. The requirements of the gas equipment will dictate the size of the gas piping to that equipment.

Industrial or commercial loads may require higher delivery pressures after application to and approval by National Grid.

1.5 Gas Metering and Regulation

National Grid will furnish and install gas metering equipment necessary for National Grid billing purposes. National Grid will also furnish and install, when required, the proper regulating equipment to govern the pressure under which gas is delivered. Normal delivery pressure is 4" to 6 1/2" water column (W.C.). The applicant will provide a location on their premises suitable to National Grid for the installation of the metering and regulating equipment. Regulators and/or meters, wherever practical shall be located outside. Any equipment or piping located outside the customer's building that could be subjected to hazardous conditions will require protection.

Only National Grid employees shall repair, alter, open, or make connections to the service lines or do any work on parts of the Company's gas supply system.

The breaking of seals by unauthorized persons or the tampering with meters or with any piping in connection with the meter is prohibited. Attention is directed to Section 165.15, "Theft of Service," of the New York Penal Law, which defines utility theft. Whenever the installation, repair or maintenance of underground natural gas piping is planned the local utility should be contacted for guidance.

Section 2

CONSTRUCTION REQUIREMENTS

2.1 General Requirements

The following rules shall be observed when installing underground gas lines:

- a) Prior to digging near underground facilities, call **Dig Safely New York at (800) 962-7962** to request a markout of any underground facilities that may be in your work site. **This call must be made at least two, but not more than ten working days before you begin excavation.**
- b) Connections should be terminated outside and above grade. c) Each gas line requires a **shut off valve** that is accessible from outside the building. The gas shut off valve shall have a minimum clearance of at least six inches (6") above final grade after landscaping.
- d) Each gas line must contain an **insulated fitting** to electrically isolate the below ground piping. The insulator may be in the form of an insulated union, insulated valve or insulated flange unit, and should be installed as close as practical above the grade line for outside terminations or as soon as practical within a building.
- e) **Building entrances**, whenever possible, should be made above grade when connecting to piping inside the building.
- f) **Clearances** of at least 12 inches shall be maintained from any subsurface structures not directly associated with the gas line. Avoid interference with **foreign structures** such as water curb boxes, sewer vents, catch basins, manholes, water mains, buried telephone or electric lines.
- g) **Trenches** should not be dug closer than 3 feet to side lot lines, or underground telephone, electric, sewer and water lines when alternative routes are possible. Avoid crossing drain fields or septic tanks. Common trench installation information will be provided upon request.
- h) **Avoid** installing underground gas piping beneath or through concrete pads, planters, piers, or pilasters. Also avoid locations through paved areas whenever possible.
- i) **Cover** over buried gas lines shall be a minimum of 18", except where prevented by underground conditions. Where this can not be done, approval for less cover will be required and the piping shall be further protected by encasement, bridging or shielding.
- j) **Support** each underground gas line on well compacted soil or a continuous support system, which has been designed to avoid harmful additional loading to the pipe. Shear point protection should be provided if conditions warrant.
- k) **Backfill** must be free of any materials that could be harmful to the pipe. Sand padding around the pipe will be required when existing soil conditions are inadequate for pipe protection.
- l) **Protection** will be required for any equipment or piping located outside the customers building that could be subjected to hazardous conditions.
- m) Gas lines penetrating an outside wall below grade require a **wall sleeve** and that portion must be wrapped carbon steel. The sleeve shall have a minimum 1" internal diameter clearance from the outside of the gas line. Openings between the casing pipe and tubing shall be filled with either duxseal or urethane foam. (Below grade entrances are not recommended).

2.2 Materials

Due to Federal and State requirements, National Grid prefers the use of high-density polyethylene plastic pipe (made with 3408 base resin) in the construction of service lines. Other materials may be used, but must be industry approved (to ASTM standards) and will be subject to approval by National Grid Gas Engineering prior to use.

High-density plastic is also the preferred material for the construction of yard lines, but any materials that meet NFPA Standards as a minimum may be used.

If you are planning a large underground project that could require plastic piping up to 12 inches in diameter or any size steel piping, contact the regional gas marketing group in your area for referral assistance.

2.3 Service Line Construction

Customer owned service lines must be constructed (using industry approved materials conforming to ASTM specifications) and maintained in accordance with NYCRR, Title 16, Parts 255 and 230, just as the National Grid built portion of the gas service line is. Customers who elect to follow National Grid standards will meet or exceed the minimum requirements of NYCRR, Title 16, Part 255.

National Grid encourages owners to utilize materials consistent with those used by National Grid. This allows the company to better assist the customer to facilitate repairs or replacement, should they become necessary.

However, the owner may opt to use other materials and/or equipment (still meeting NYCRR, Title 16, Part 255 Standards). If this becomes the case, National Grid can assist the customer in obtaining any pertinent sections of NYCRR, Title 16 upon request.

Prior to backfilling National Grid is required, by law, to inspect the construction of all customer owned service lines. This inspection can be arranged through the Regional Gas Marketing Representative.

Before the service can be activated, the customer needs to show assurance that all mandated construction requirements and material specifications were met. If needed, a National Grid Representative will review the list with you and explain any or all requirements in detail.

2.4 Service Line Inspection and Testing Requirements

Prior to backfilling National Grid must inspect the service line for the following:

1. All Federal and/or State Construction Regulations will be followed.
2. A 90 psi air test was successfully performed for a period of 15 minutes.
3. Gas industry approved materials were used.
4. A tracer wire is installed with plastic pipe.
5. Plastic joiners or welders are qualified as outlined in NYCRR, Title 16, Part 255.

NOTE: Qualification services are available through NATIONAL GRID at the customer's option.

6. Copies of the plastic joining procedure (manufacturer's procedure) or welding procedure (meeting the requirements of API or ASME) are available for National Grid files.
7. Industry approved cathodic protection methods are used for underground steel pipe (NACE standards will apply).
8. A sketch or drawing of sufficient detail to show the entire location of the customer owned underground service line is provided to National Grid (for leak survey purposes).
9. A completed Gas Piping Compliance Certificate (see page 21) will be provided to National Grid at the time of inspection.

If the above requirements are met, the company will activate the service.

If the above requirements are not met, the company has the right to refuse or suspend service until remedial action is made by the customer to assure compliance to applicable National Grid and/or Part 255 Standards.

National Grid is responsible, by law, to assure that all repairs or replacements are consistent with service line standards as dictated by NYCRR, 16 Part 255.

National Grid may make repairs (reimbursed by the customer) if the customer's materials are compatible, or will inspect (free of charge) repairs made by a qualified contractor.

National Grid strives to minimize customer service interruptions; however, National Grid is not responsible to insure when repairs are made. National Grid is only responsible that when made, repairs meet NYCRR 16, Part 255 Standards.

Note: National Grid will assist the customer in the acquisition of approved repair materials whenever possible.

2.5 Yard Line Construction

Any customer owned/installed underground yard line must be constructed and tested to the National Fuel Gas Code - NFPA 54 (latest revision). National Grid encourages however, that customers construct these underground lines with materials and standards consistent to service lines.

2.6 Yard Line Inspection and Testing Requirements

No documentation is required by National Grid for customer owned yard lines, with the exception of a detailed sketch of the yard line's location when it can be provided by the customer (for leak survey purposes when the existence of these lines is known).

Although not required, National Grid will inspect these lines during or after construction, free of charge, to NFPA 54 standards if the customer requests the inspection.

2.7 Survey Requirements

As stated previously, National Grid is required to perform a periodic leak survey on all underground gas lines, whether customer owned or not. These leak surveys are performed with no cost to the customer.

Section 3

POLYETHYLENE PLASTIC

3.1 Introduction

Due to Federal and State requirements, National Grid prefers the use of high-density polyethylene plastic pipe (type 3408 base resin). Other materials may be used, but must be industry approved (to ASTM D-2513 standards) and will be subject to approval by National Grid Gas Engineering prior to use.

An approved rigid metal gas tight riser sleeve shall be used when plastic lines terminate above ground.

An approved plastic to steel transition fitting shall be used to terminate plastic pipe when the rigid metal gas tight riser is not used. (When it is impractical to terminate above grade).

3.2 Joining Methods

General Information

The joining of polyethylene shall be performed by individuals whose training and qualifications have been reviewed and approved by National Grid. No other methods than those described below are to be used in joining polyethylene plastics.

Special static grounding instructions must be followed when joining new polyethylene plastic piping to existing polyethylene plastic whenever a gas and air mixture could be present.

Mechanical Stab-Type Connectors

Approved mechanical stab-type connectors may be used for the joining of plastic pipe and tubing for underground gas lines in 1/2", 1", 1 1/4" and 2" sizes. The use of stab type connectors is the recommended method of joining for contractor installed piping.

Plastic Fusion Connections

Plastic fusion will be the only joining method used for all pipe over 2" in diameter. Plastic joiners or welders must be qualified as outlined in NYCRR, Title 16, Part 255.

NOTE: Qualification services for trained fusers are available through NATIONAL GRID at the customer's option.

3.3 Riser Protection Sleeves (Above Grade)

Each polyethylene plastic pipe that terminates outside shall have a NMPC approved rigid metal gas tight riser protection sleeve installed to provide protection for the plastic from physical damage above grade and shear stresses that develop below grade. Where required, an appropriate wall-mounting bracket shall be used. (See Exhibit V)

Transition Joints (Below Grade)

An approved transition fitting may be used where it is necessary to adapt the polyethylene plastic for connection to a steel section or fitting for below grade installations. Below grade terminations are not recommended. (See Exhibit 111)

Locator Wire

A locator wire must be installed with each direct burial polyethylene plastic line. This wire can be used to determine the location of the plastic piping at a future time. The minimum size locator wire should be a single conductor, coated No. 12 AWG stranded copper.

The locator wire must be attached to each riser protection sleeve. The end of the wire must be brought above grade, looped and taped to the riser protection sleeve just below the valve.

The wire must be located alongside the plastic pipe, as close as construction permits, but do not wrap around the plastic. A space should be maintained between the wire and the plastic pipe so that any stray current picked up on the wire will not damage the plastic pipe.

3.4 Support Instructions for Polyethylene Plastic

General

Polyethylene plastic pipe, tubing and fittings shall be carefully inspected for cuts, scratches, gouges, or other harmful imperfections. This must be done before installation and again before backfilling.

Whenever any damage described above is found, the damaged section must be cut out and replaced

Underground gas lines and terminations shall be properly supported at all points on undisturbed or well compacted soil.

Slack

Polyethylene plastic must be installed with sufficient slack so that thermal contraction or external loading will not place unnecessary stress or tensile pull on the piping, tubing or joints.

Shear Point Protection

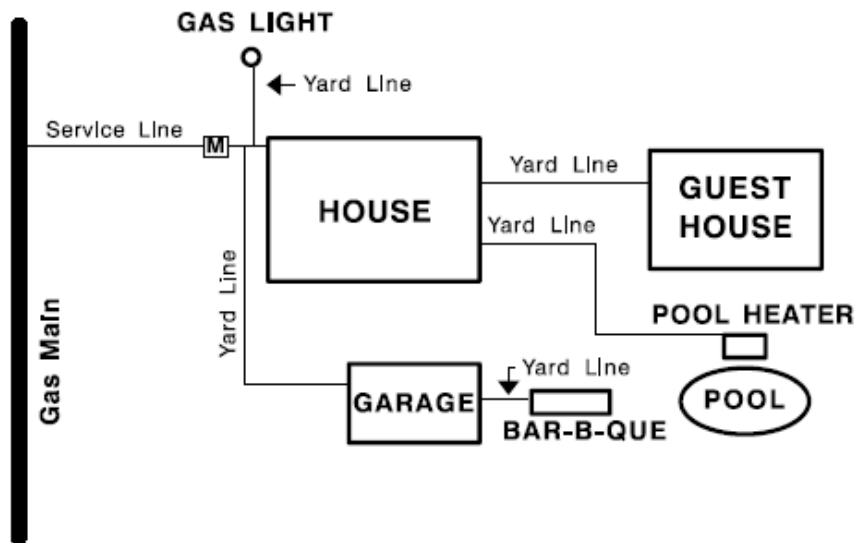
Protection is required at points subject to shear stress. These points may develop between different soil conditions such as undisturbed and excavated soil or at joints between metal or plastic fittings and plastic tubing. (See Exhibit V)

Insert Protection

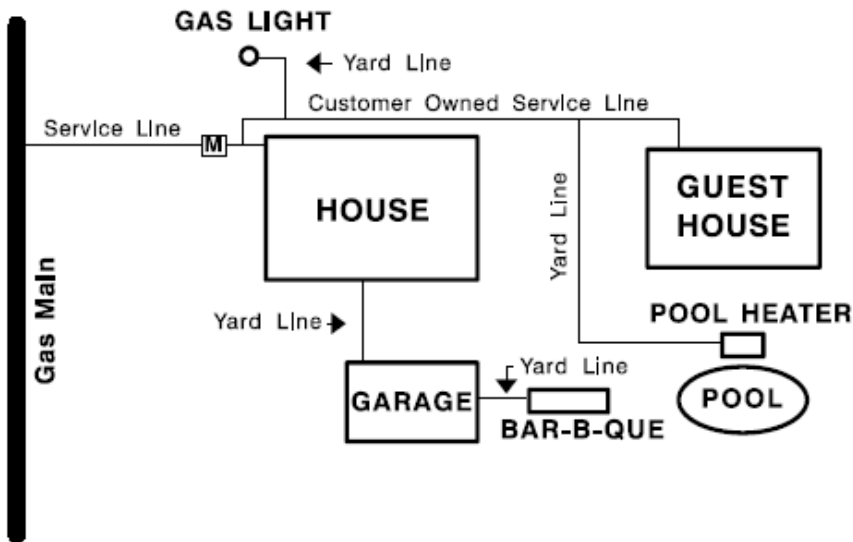
Whenever inserting polyethylene plastic through an existing metallic casing pipe, insert protection is required to protect the surface of the tubing against damage.

The following two examples demonstrate how an underground gas line can be classified as service line or yard line by way of route or configuration.

Piping Example 1

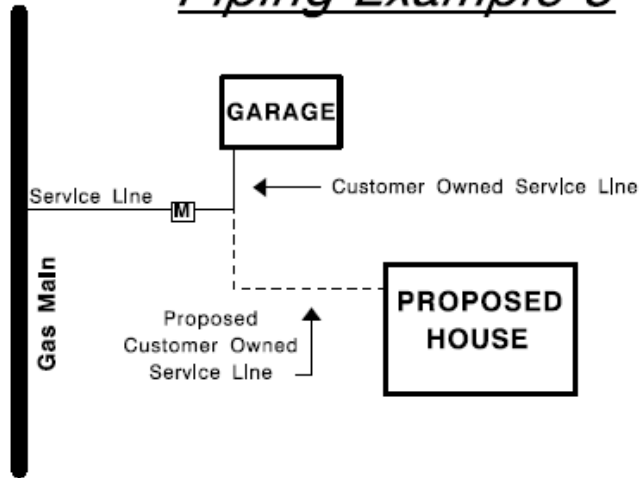


Piping Example 2



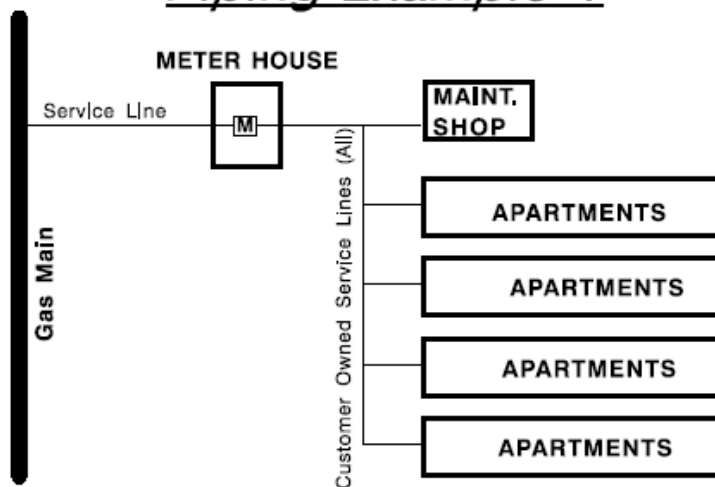
Example 3 demonstrates how an underground gas line which normally would be classified as a yard line, becomes a service line because it is the initial and only activated line in use.

Piping Example 3



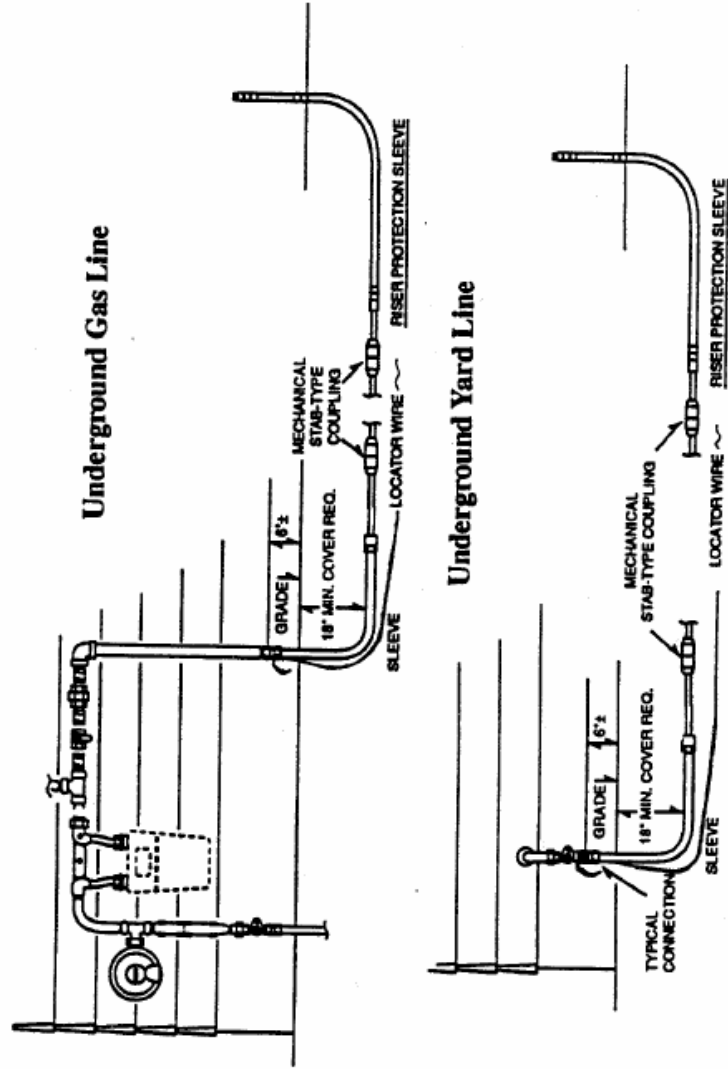
Example 4 shows that a meter house is not considered a building. Lines that exit a meter house are still service lines if they go underground to habitable structures.

Piping Example 4



POLYETHYLENE PLASTIC PIPE
NMGas Standards for Polyethylene Gas Piping

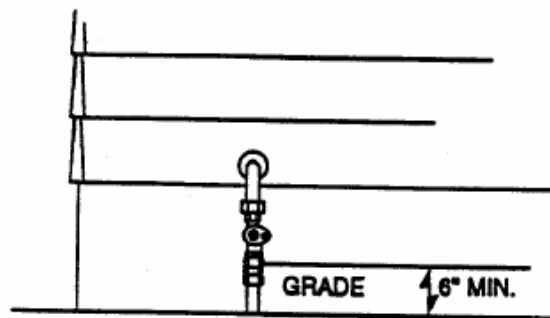
TYPICAL GAS LINE INSTALLATIONS



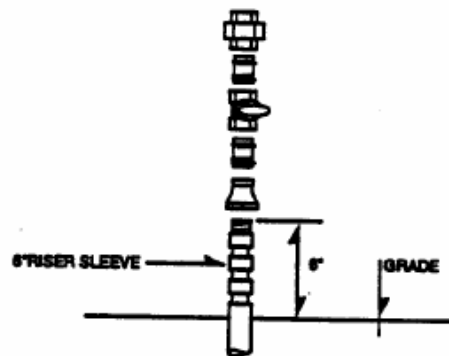
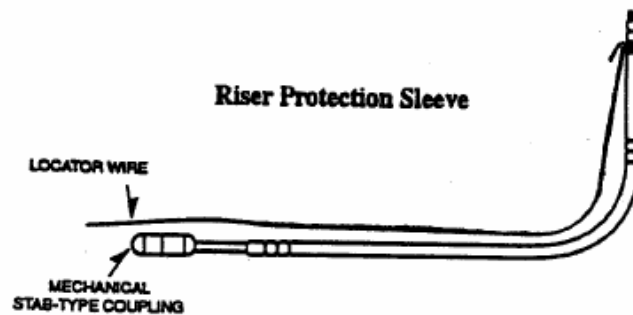
POLYETHYLENE PLASTIC PIPE

NMGas Standards for Polyethylene Gas Piping

OUTSIDE TERMINATIONS



Outside Termination



Typical Connection

POLYETHYLENE PLASTIC PIPE

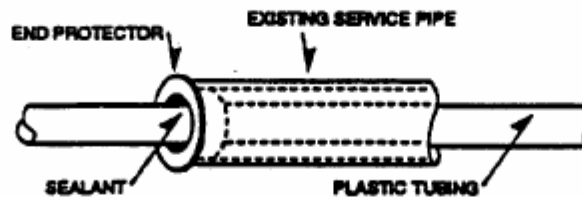
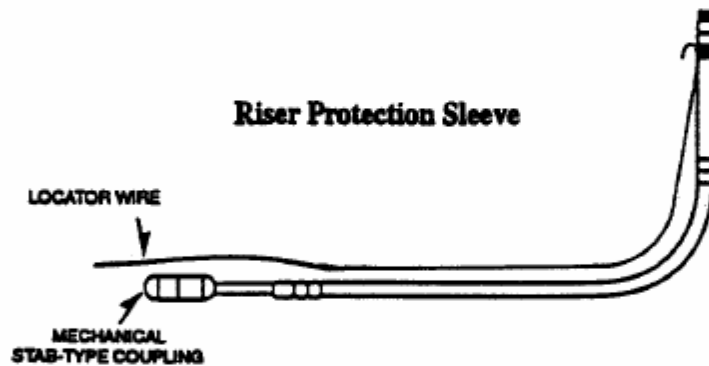
NMGas Standards for Polyethylene Gas Piping

PLASTIC PIPE MATERIALS

**Mechanical
Stab-Type Coupling**



Riser Protection Sleeve



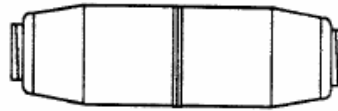
Protection Sleeve



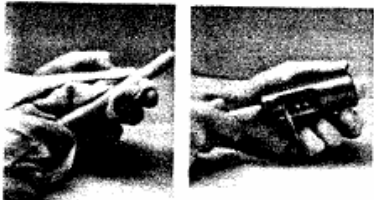
How to install the PERMASERT™ Non-Corrosive Mechanical Coupling

Properly installed, Perfection's one-piece utility-approved mechanical fittings provide a virtually fail-safe joining system for PE gas distribution systems.

Mechanical Stab-Type Coupling



This easy five-step installation procedure assures you of consistent gas tight seals that resist pull-out to the destruction of the pipe or tubing being joined.



Qualified Installation Instructions

1. Cut the tubing so that the end is square.
2. Wipe with a clean dry cloth. Inspect for scratches or gouges. If you find any, cut again so that the last 2 to 6 inch section, depending on size, has no surface defects.
3. Use the Perfection Chamfering tool for a proper O.D. chamfer. This chamfer permits the tubing to be completely stabbed without damaging the internal seals.
4. Use a soft felt tip pen, crayon, or grease pencil to mark the stab depth as indicated on your PERMASERT package instructions. The stab depth is the approximate distance from the edge of the fusion bead to the end of the fitting body.
5. Stab the tubing into the PERMASERT fitting so that the stab depth mark is visible within 1/8" of the end of the fitting. Pressure test the joint in accordance with your standard procedures.

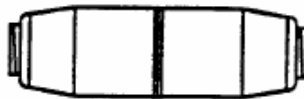
1/92

POLYETHYLENE PLASTIC PIPE

NMGas Standards for Polyethylene Gas Piping

PLASTIC PIPE MATERIALS JOINING INSTRUCTIONS

Mechanical
Stab-Type Coupling

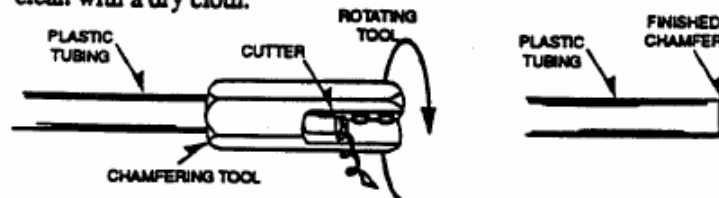


Installation Procedure

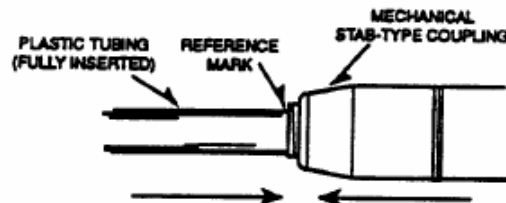
- 1) Squarely cut the end of the tubing to be inserted and wipe with a clean dry cloth. The tubing must be free of blemishes (cuts, gouges, scratches, etc.) and remain so to insure a satisfactory connection.

Note: Enough line slack should be provided to compensate for thermal contraction.

- 2) Chamfer the tubing end using the special chamfer tool. Wipe the tubing clean with a dry cloth.



- 3) Measure the distance from the nearest edge of the rolled fusion bead seam of the coupling to the end of the plastic body. This is shown as the reference mark on the illustration in Step 4. Mark the tubing at this distance back from the chamfered end. This mark will provide a reference line to assure that the coupling has been fully inserted.
- 4) Stab tubing fully into coupling to depth of mark. Tubing must bottom out in coupling. Do not twist tubing or coupling during insertion.



SECTION 5
REGIONAL INFORMATION

- When landscaping, the gas shutoff valve (normally located just before the meter) shall be maintained at least six inches above final grade.
- Contact Dig Safely New York, (1-800-962-7962) prior to digging near any underground facilities.
- Only qualified personnel shall install and maintain appliances that use natural gas.
- All gas piping and appliances shall meet American National Standards Institute (ANSI) requirements.
- Gas lines that terminate at a valve shall have a proper plug or nipple and cap installed that will remain in place until a final connection is made.
- National Grid provides 24-hour emergency service.
- The customer should immediately notify the Company of any suspected gas leaks. Notification can be made by calling the following telephone numbers.

National Grid Telephone Numbers

<u>Customer Service</u>	<u>Gas Emergency</u>	<u>Inspections</u>
	1-800-892-2345	

NATIONAL GRID GAS
CUSTOMER-OWNED/INSTALLED UNDERGROUND
CUSTOMER-OWNED / INSTALLED UNDERGROUND GAS COMPLIANCE
CERTIFICATE

CUSTOMER NAME: _____

ADDRESS: _____

PHONE: _____

The undersigned hereby certifies that the gas piping installation at the above address conforms to the following:

1. All piping materials, joining methods and installation procedures are in accordance NYCRR Title 16 Part 255 and/or the latest edition of the National Fuel Gas Code.
2. The piping has passed a pressure test conducted in accordance NYCRR Title 16 Part 255 and/or the latest edition of the National Fuel Gas Code.
3. All gas utilization equipment and appurtenances are ASTM, AGA, UL, Inchcape or Warnock - Heresy certified.
4. The contractor has provided National Grid, at the time of inspection, with a sketch including measurements depicting the location of the underground gas piping (reverse side may be used).

Contractor's Signature: _____ Date: _____

National Grid Representative: _____ Date: _____

PRESSURE TEST REPORT

Service Address: _____ City: _____

Tested at: _____ psig - for _____ Minutes / Hours

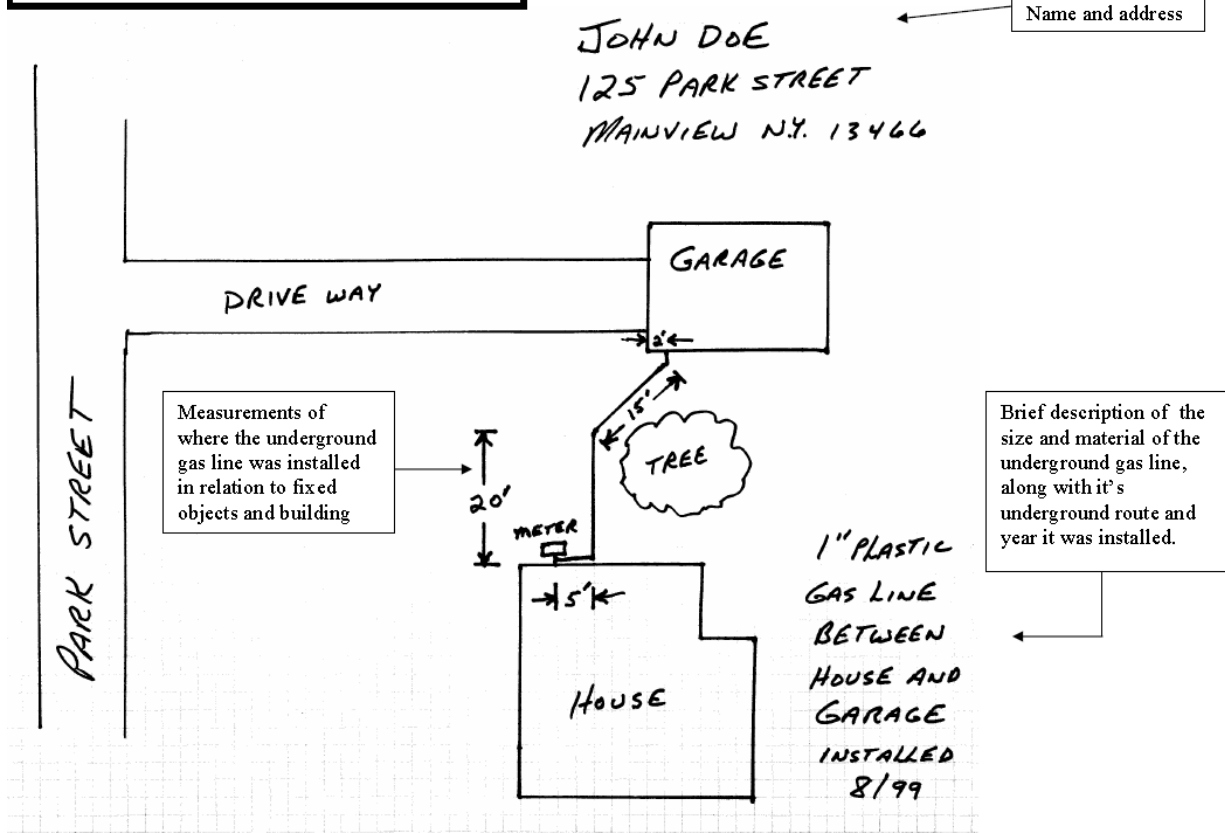
Date: _____

Company Name: _____

Company Phone: _____

Signature: _____ (Print) _____

Example of a customer drawn gas line sketch



APPENDIX C

APPENDIX C

CHOOSING A FURNACE OR BOILER

Higher Efficiency. Its Advantages and Disadvantages

Since the energy crisis of the 1970's consumers have been motivated to demand higher efficiency furnaces and boilers, and to increase the thermal insulation and tightness of their homes. As a result, manufacturers have responded with the higher efficiency heating units which are widely in use today, and builders have responded with the increase in tighter construction methods for homes now equally widely used. As a result of these new trends, a significant amount of attention has been focused on certain technical topics in the heating business which have traditionally been accepted as cut and dried, but recently have caused some controversy. It was discovered, to the dismay of many, that these long-accepted ways of installing heating appliances are no longer valid. The changes faced by today's furnace and boiler installers include increased efficiency, reduced dilution air, increased air contamination and decreased heating loads. It has been common to discover that new installations are deficient because of improper combustion, dilution and ventilation air, and even improperly selected boiler or furnace sizes. Therefore, the following information is provided to help ensure that new installations and conversions are properly designed and installed. The correct place to begin is for to selecting a furnace or boiler for your installation.

Increased Thermal Efficiency Proper Venting

Increased thermal efficiency of newer units means, among other things, that for a given retrofit installation in a building that has not been modified using insulation and/or caulking, a smaller capacity unit will often do the same job as the older unit did. But it is possible that the older unit may not have been sized correctly! Indeed, many older units were oversized. Therefore, it can be problematic to simply substitute a new unit of the same input as the older one., Increased efficiency of abeating unit typically means a lower flue gas temperature, since most higher efficiency units wring out more Btu's from the flue gases in their heat exchangers. This lower outlet temperature means that the flue gases start their trip out the vent much closer to their dewpoint. Thus, condensate will be produced in the vent earlier in the on-cycle, and more condensate per total unit volume of flue gases will be produced in the new units than in the older, less efficient units. This means that the "wet time" in the vent will be longer, during which time the condensate stays in the stack without being vaporized by flue gases.

Since many Category I, mid-efficiency units are fan-assisted, the draft hood is eliminated, thereby essentially eliminating dilution air to the vent, reducing the total vent flow. Combining this characteristic with the use of vent dampers, off cycle loss of gases through the vent is reduced drastically. As a result, no dilution air can be relied on during the off cycle to help dry the stack. In addition, these characteristics combine to leave a vent pipe even colder during the off-cycle than in older less efficient units, requiring a longer time to heat up during the on-cycle.

In summary, comparing a newer, more efficient unit to an older less efficient unit of the same input, a smaller volume of flue gases will flow in the new unit at a lower temperature through a colder vent, which must be relied upon to remove essentially the same amount of water vapor as was produced in the old unit. The capacity of these gases to vaporize the moisture is significantly less in the new unit as compared to the old. The result is longer wet time in the new unit's vent, a condition which promotes corrosion very quickly, especially if chlorine from indoor air condition is absorbed into the condensate, producing hydrochloric acid. A corroded vent can release deadly carbon monoxide into the living space. An equally deadly scenario is the deterioration that takes place in a masonry chimney, where the mortar disintegrates, the lining collapses, and the chimney becomes blocked, also spilling flue gases into the living space.

Special care must be taken when replacing older heating equipment that will be vented into an existing exterior masonry chimney. Please follow the Venting tables listed in NFPA-54 or the FGCNYS.

Tighter Buildings: Combustion Air

If the building has been upgraded with new insulation, thermal-pane and tightly sealed windows, along with caulking and wrapping, the thermal characteristics of the building have been altered to make it more thermally efficient. The increased thermal efficiency of a building means the heating load is lower. The tightness of the building means the infiltration losses have been decreased, but the combustion air requirements, which formerly depended on a certain amount of infiltration, must be closely re-examined. If infiltration, and therefore some of the source of combustion air, has been drastically reduced, the reduction can increase spillage of combustion products upon start-up of a draft hood appliance. Secondly, the lowered rate of air change means that any source of combustion air contamination, such as chlorides from hairsprays, etc. will remain at an elevated concentration rather than be diluted. Contaminants containing chlorine have been shown to greatly increase the corrosivity of flue gas condensate, forming hydrochloric acid.

All of these characteristics taken together require that a vent be sized as carefully as possible, with special attention not to over-size the vent. In the past, gas furnaces and boilers released more than 25 % of their input energy into their vents. This generous amount of heat flowing through the vent made vents much more forgiving of design errors. Now, proper venting of higher efficiency furnaces and boilers requires more knowledge and greater care on the part of the installer.

A Case of Improper Venting

Clearly, a great deal of attention must be paid to venting of modern boilers/furnaces. Take as an example, a typical situation where a person installs a new boiler to replace an aging, less efficient one. In assessing the situation, it is determined that a newer, Category I, mid efficiency, fan assisted unit is a sound, economical choice. It seems logical that a unit of the same input rating should be selected. A contractor is hired, and installs most things properly, but vents the unit to the same outside chimney used for the older unit. After a period of time, the consumer calls National Grid Energy Delivery to trouble-shoot a "leak" in his newly installed boiler. He is dismayed to discover that there is no real leak, but that his chimney is condensing. He decides that this is not a real problem, and that there is no need for further action. Soon his chimney tiles begin to collapse inside, and begin to block the vent gases to the point where the unit shuts down on high pressure. Now he has a very large repair bill on his hands to rectify his collapsed chimney. All of this could have been prevented by selecting the correct venting arrangement. In this case, an approved, listed chimney liner system, properly sized and installed, would have saved a large sum of money and many headaches.

Pre-Sale Inspection

The heating contractor seeking to sell a furnace should begin approaching a job by first carefully assessing the heating load of the structure, the suitability of the existing system vent, and the environment into which the unit will be placed. It is also important that sales and installation personnel understand the venting characteristics of the different types of appliances available on the market, as well as the differences in combustion, dilution and ventilation air requirements of the newer, higher efficiency units. Computer heat loss programs exist in the market today that make this tedious task less demanding.

Special care must be taken when replacing older heating equipment that will be vented into an existing exterior masonry chimney

Retrofit furnaces or boilers should not be recommended to the consumer on the basis of rules-of-thumb regarding the heat load, nor should it be assumed that the existing venting system can be used without modification. It is imperative that the selection and sales process include a pre-sale inspection of the existing furnace or boiler, the venting system, and the building. It is important to recognize that every furnace or boiler is not equally well suited to every installation. The inspection will help the seller to accurately determine which furnace or boiler can be recommended to the consumer, and will avoid problems for all parties involved.

CO ALARMS

In New York City, Local Law 7, requires the installation of CO (carbon monoxide) Alarms in all new and existing 1 and 2 family houses, apartment buildings, hotels dormitories, nursing homes and schools, where fossil fuel burning furnaces or boilers are installed.

In New York State, Part 1225.2 of Title 19, requires the installation of CO Alarms in newly constructed dwelling units and in dwellings units offered for sale.

The heating contractor should be familiar with the NYC and NYS CO Alarm Law and should determine if a working CO Alarm is installed at the location and should discuss the CO Alarm Laws with the customer.

For full text of the NYC and NYS CO Alarm Law, see appendix G

Please note: National Grid recommends the installation of CO Alarms in all areas and recommends annual maintenance of the heating system.

APPENDIX D

Corrugated Stainless Steel Tubing (CSST)

At its meeting held on September 10, 2008, the State Fire Prevention and Building Code Council determined that adopting this rule on an emergency basis is necessary to preserve public safety by clarifying requirements for electrical bonding of gas piping, clarifying requirements for protection of gas piping against physical damage, and adding new requirements for installation of gas piping made of corrugated stainless steel tubing (CSST), which will increase protection against fires caused by lightning strikes in the vicinity of buildings equipped with CSST gas piping and fires caused by accidental punctures of CSST gas piping.

EFFECTIVE September 25, 2008

Subdivision (d) of section 1220.1 of title 19 NYCRR is amended by adding new paragraphs (9), (10), (11), and (12) to read as follows:

(9) 2007 RCNYS Section G2411.1. For the purposes of applying the 2007 RCNYS in this State, the text of Section G2411.1 in Chapter 24 of the 2007 RCNYS shall be deemed to be amended and restated in its entirety to read as follows:

“G2411.1 (310.1) Gas pipe bonding - systems that contain no CSST. In the case of a gas piping system that contains no corrugated stainless steel tubing (CSST), each above-ground portion of the gas piping system that is likely to become energized shall be electrically continuous and bonded to an effective ground-fault current path. Gas piping shall be considered to be likely to become energized if any gas utilization equipment is connected to any portion of the gas piping system and to any electrical circuit(s). For the purposes of this Section G2411.1, gas piping shall be considered to be bonded to an effective ground-fault current path if such gas piping is connected to gas utilization equipment that is connected to the equipment grounding conductor of the circuit supplying that equipment. Nothing in this Section G2411.1 shall prohibit the bonding a gas piping system that contains no CSST in any manner described in Section E3509.7 of this code. (10) 2007 RCNYS Section G2411.2.”

(10) For the purposes of applying the 2007 RCNYS in this State, a new Section G2411.2 (to include sections G2411.2, G2411.2.1, G2411.2.2, and G2411.2.3) shall be deemed to be added to Chapter 24 of the 2007 RCNYS, immediately following Section G2411.1, said new Section G2411.2 to read as follows:

“G2411.2 (310.2) Gas pipe bonding - systems that contain CSST. A gas piping system that contains any corrugated stainless steel tubing (CSST) shall be electrically continuous and shall be bonded to the electrical service grounding electrode system at the point where the gas service enters the building or structure. No portion of the gas piping system shall be used as or considered to be a grounding

electrode or a grounding electrode conductor. CSST shall be installed and bonded in accordance with this section G2411.2, and the stricter of: (a) the requirements set forth in the CSST manufacturer's installation instructions, or (b) the requirements set forth in Sections G2411.2.1, G2411.2.2, G2411.2.3, and G2415.5.

“G2411.2.1 Bonding jumper. Where the electric service for the individual installation is 200 amperes or less, the bonding jumper shall not be smaller than 6 AWG copper wire or 4 AWG aluminum or copper-clad aluminum wire, and shall be permanently connected to the grounding electrode system. Where the electric service for the individual installation is more than 200 amperes, the bonding jumper size shall be determined in accordance with Table E 3503.1, and shall be permanently connected to the grounding electrode system.

“G2411.2.2 Bonding clamp. The bonding jumper shall be connected to the gas piping system with a bonding clamp that is listed for the material of the bonding jumper and for the material of the component of the gas piping system to which the bonding clamp is attached. The bonding clamp shall be attached to the gas piping system at a point which is inside the building or structure in which the gas piping is installed, on the downstream side of the gas meter or regulator, in an unconcealed and readily accessible space, and as close as practicable to the point where the gas service enters the building or structure. The bonding clamp shall be attached to a segment of metallic fuel gas pipe which (a) is a component of the gas piping system, (b) is electrically continuous with all CSST components of the gas piping system, (c) is made of steel or wrought-iron, (d) complies with Section G2414.4.2 of this code and with all other applicable provisions of Section G2414 of this code, and (e) is not less than 3 inches (76 mm) in length. Neither the CSST nor the brass hexagonal nut on the CSST fitting shall be used as an attachment point for the bonding clamp.

“G2411.2.3 Prohibited uses. CSST shall not be supported on or by other electrically conductive systems including copper water pipe, electric power cables, air conditioning and heating ducts, communication cables and structural steel beams. Electrical wiring, including the bonding jumper, shall be supported and secured independently of the CSST so that it does not come in contact with the CSST.”

(11) 2007 RCNYS Section G2415.5. For the purposes of applying the 2007 RCNYS in this State, the text of Section G2415.5 in Chapter 24 of the 2007 RCNYS shall be deemed to be amended and restated in its entirety, to include sections G2415.5 and G2415.5.1 and to read as follows:

“G2415.5 (404.5) Protection against physical damage. In concealed locations, where piping other than black or galvanized steel is installed through holes or notches in wood studs, joists, rafters or similar members less than 1.75 inches (44.45 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Such

shield plates shall comply with the requirements of Section G2415.5.1, shall cover the area of the pipe where the member is notched or bored, and shall extend a minimum of 4 inches (102 mm) above sole plates, below top plates and to each side of a stud, joist or rafter. The movement of piping made of corrugated stainless steel tubing (CSST) shall not be otherwise constrained by straps, clips or other support devices. In addition, where CSST is installed in a concealed location and parallel to any stud, joist, rafter, or similar member, the CSST shall be protected by shield plates in any area where the CSST is not (a) physically supported in a manner that ensures the CSST will always be at least 1.75 inches (44.45 mm) away from the nearest edge of any member or (b) encased in a protective metal pipe made of schedule 40 steel or iron pipe or in a protective pipe sleeve made of a material approved by the code enforcement official as the equivalent of schedule 40 steel or iron pipe. Such shield plates shall comply with the requirements of Section G2415.5.1, shall cover the area the CSST is located, and shall extend a minimum of 4 inches (102 mm) to each side of the CSST.

“G2415.5.1. Shield plates. In all cases, shield plates shall be certified or listed as complying with ANSI LC-1. In addition, in the case of piping made of CSST, shield plates shall be listed for use with the manufacturer’s CSST system.”

(12) 2007 RCNYS Section E3509.7. For the purposes of applying the 2007 RCNYS in this State, the text of Section E3509.7 in Chapter 35 of the 2007 RCNYS shall be deemed to be amended and restated in its entirety to read as follows:

“E3509.7 Bonding other metal piping. Where installed in or attached to a building or structure, metal piping systems likely to become energized shall be bonded to the service equipment enclosure, the grounded conductor at the service, the grounding electrode conductor where of sufficient size, or to the one or more grounding electrodes used. A piping system shall be considered to be likely to become energized if any equipment or appliance is connected to any portion of the piping system and to any electrical circuit(s). The bonding jumper shall be sized in accordance with Table E3808.12 using the rating of the circuit capable of energizing the piping. The equipment grounding conductor for the circuit that is capable of energizing the piping shall be permitted to serve as the bonding means. The points of attachment of the bonding jumper(s) shall be accessible.

“EXCEPTIONS:

“1. Interior metal water piping systems shall be bonded in accordance with Section E3509.6 of this code.

“2. Gas piping systems that contain no corrugated stainless steel tubing (CSST) shall be bonded in accordance with Section G2411.1 of this code.

“3. Gas piping systems that contain CSST shall be installed and bonded in accordance with Section G2411.2 of this code.”

Subdivision (b) of section 1224.1 of title 19 NYCRR is amended to read as follows:

(b) Referenced standards. Certain published standards are denoted in the 2007 FGCNYS as incorporated by reference into 19 NYCRR Part 1222. Such standards are incorporated by reference into this Part 1224. Such standards are identified in the 2007 FGCNYS, and the names and addresses of the publishers of such standards from which copies of such standards may be obtained are specified in the 2007 FGCNYS. Such standards are available for public inspection and copying at the office of the New York State Department of State specified in subdivision (a) of this section. In addition, the 2005 edition of standard NFPA 70, entitled “National Electrical Code” (said standard being hereinafter referred to as NFPA 70-2005) shall be deemed to be one of the standards incorporated by reference into this Part 1224. The name and address of the publisher of NFPA 70-2005 from which copies of said standard may be obtained are:
National Fire Protection Association
Batterymarch Park
Quincy, MA 02269.
NFPA 70-2005 is available for public inspection and copying at the office of the New York State Department of State specified in subdivision (a) of this section.

Subdivision (c) of 1224.1 of Title 19 NYCRR is amended by adding new paragraphs (2), (3), and (4), to read as follows:

(2) 2007 FGCNYS Section 310.1. For the purposes of applying the 2007 FGCNYS in this State, Section 310.1 in Chapter 3 of the 2007 FGCNYS shall be deemed to be amended and restated in its entirety to read as follows:

“310.1 Gas pipe bonding - systems that contain no CSST. In the case of a gas piping system that contains no corrugated stainless steel tubing (CSST), each above-ground portion of the gas piping system that is likely to become energized shall be electrically continuous and bonded to an effective ground-fault current path. Gas piping shall be considered to be likely to become energized if any gas utilization equipment is connected to any portion of the gas piping system and to any electrical circuit(s). For the purposes of this Section 310.1, gas piping shall be considered to be bonded to an effective ground-fault current path if such gas piping is connected to gas utilization equipment that is connected to the equipment grounding conductor of the circuit supplying that equipment. Nothing in this Section 310.1 shall prohibit the bonding a gas piping system that contains no CSST in any manner described in Section 250.104(B) of NFPA 70-2005.”

(3) 2007 FGCNYS Section 310.2. For the purposes of applying the 2007 FGCNYS in this State, a new Section 310.2 (to include sections 310.2, 310.2.1, 310.2.2, and 310.2.3) shall be deemed to be added to Chapter 3 of the 2007 FGCNYS, immediately following Section 310.1, said new Section 310.2 to read as follows:

“310.2 Gas pipe bonding - systems that contain CSST. A gas piping system that contains any corrugated stainless steel tubing (CSST) shall be electrically continuous and shall be bonded to the electrical service grounding electrode system at the point where the gas service enters the building or structure. No portion of the gas piping system shall be used as or considered to be a grounding electrode or a grounding electrode conductor. CSST shall be installed and bonded in accordance with this section 310.2, and the stricter of: (a) the requirements set forth in the CSST manufacturer’s installation instructions, or (b) the requirements set forth in Sections 310.2.1, 310.2.2, 310.2.3, and 404.5 of this code.

“310.2.1 Bonding jumper. Where the electric service for the individual installation is 200 amperes or less, the bonding jumper shall not be smaller than 6 AWG copper wire or 4 AWG aluminum or copper-clad aluminum wire, and shall be permanently connected to the grounding electrode system. Where the electric service for the individual installation is more than 200 amperes, the bonding jumper size shall be determined in accordance with Table 250.66 and Sections 250.66(A) through 250.66(C) of NFPA 70-2005, and shall be permanently connected to the grounding electrode system.

“310.2.2 Bonding clamp. The bonding jumper shall be connected to the gas piping system with a bonding clamp that is listed for the material of the bonding jumper and for the material of the component of the gas piping system to which the bonding clamp is attached. The bonding clamp shall be attached to the gas piping system at a point which is inside the building or structure in which the gas piping is installed, on the downstream side of the gas meter or regulator, in an unconcealed and readily accessible space, and as close as practicable to the point where the gas service enters the building or structure. The bonding clamp shall be attached to a segment of metallic fuel gas pipe which (a) is a component of the gas piping system, (b) is electrically continuous with all CSST components of the gas piping system, (c) is made of steel, wrought-iron, copper (if permitted by Section 403.4.3 of this code), or brass (if permitted by Section 403.4.3 of this code), or aluminum, (d) complies with the applicable provisions of Section 403.4 of this code and with all other applicable provisions of Section 403 of this code, and (e) is not less than 3 inches (76 mm) in length. Neither the CSST nor the brass hexagonal nut on the CSST fitting shall be used as an attachment point for the bonding clamp.

“310.2.3 Prohibited uses. CSST shall not be supported on or by other electrically conductive systems including copper water pipe, electric power cables, air conditioning and heating ducts, communication cables and structural steel beams. Electrical wiring, including the bonding conductor, shall be supported and secured independently of the CSST so that it does not come in contact with the CSST.”

(4) 2007 FGCNYS Section 404.5. For the purposes of applying the 2007 FGCNYS in this State, Section 404.5 in Chapter 4 of the 2007 FGCNYS shall be deemed to be amended and restated in its entirety, to include sections 404.5 and 404.5.1 and to read as follows:

“404.5 Protection against physical damage. In concealed locations, where piping other than black or galvanized steel is installed through holes or notches in wood studs, joists, rafters or similar members less than 1.75 inches (44.45 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Such shield plates shall comply with the requirements of Section 405.5.1, shall cover the area of the pipe where the member is notched or bored, and shall extend a minimum of 4 inches (102 mm) above sole plates, below top plates and to each side of a stud, joist or rafter. The movement of piping made of corrugated stainless steel tubing (CSST) shall not be otherwise constrained by straps, clips or other support devices. In addition, where CSST is installed in a concealed location and parallel to any stud, joist, rafter, or similar member, the CSST shall be protected by shield plates in any area where the CSST is not (a) physically supported in a manner that ensures the CSST will always be at least 1.75 inches (44.45 mm) away from the nearest edge of any member or (b) encased in a protective metal pipe made of schedule 40 steel or iron pipe or in a protective pipe sleeve made of a material approved by the code enforcement official as the equivalent of schedule 40 steel or iron pipe. Such shield plates shall comply with the requirements of Section 405.5.1, shall cover the area the CSST is located, and shall extend a minimum of 4 inches (102 mm) to each side of the CSST.

“405.5.1. Shield plates. In all cases, shield plates shall be certified or listed as complying with ANSI LC-1. In addition, in the case of piping made of CSST, shield plates shall be listed for use with the manufacturer’s CSST system.”

EFFECTIVE September 25, 2008

APPENDIX E

APPENDIX E

New York State CO Alarm Law

Amanda's Law

Carbon monoxide alarm requirements to go into effect February 22, 2010

As the result of legislation, Amanda's Law will go into effect February 22, 2010. It requires essentially all residences, both new and existing, to have carbon monoxide alarms installed. The specific requirements differ for new and existing residences and also on when the buildings were built and subcategories of occupancy groups. Existing one and two family residences will be required to have one carbon monoxide alarm installed on the lowest story having a sleeping area.

Subdivision (d) of section 1220.1 in Part 1220 of Title 19 NYCRR is amended by adding a new paragraph (13) to read as follows:

(13) 2007 RCNYS section RR313.4. For the purposes of applying the 2007 RCNYS in this State, the text of section RR313.4 in chapter R3 of the 2007 RCNYS shall be deemed to be amended and restated in its entirety to read as follows:

“RR313.4 Carbon monoxide alarms. This section covers the installation, performance and maintenance of carbon monoxide alarms and their components in new and existing buildings. The requirements of this section shall apply to all new and all existing buildings, without regard to the date of construction of the building and without regard to whether such building shall or shall not have been offered for sale.

“Exception: Compliance with this section is not required where no carbon monoxide source is located within or attached to the structure. However, compliance with this section is required if any carbon monoxide source is subsequently located within or attached to the structure.

“For the purposes of this section RR313.4, the following terms will have the following meanings:

“The term ‘carbon monoxide source’ includes fuel fired appliances, equipment, devices and systems; solid fuel burning appliances, equipment, devices and systems; all other appliances, equipment, devices and systems that may emit carbon monoxide; fireplaces; garages; and all other motor vehicle-related occupancies.

“The term ‘dwelling unit’ means a single unit providing complete, independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

“The term ‘**sleeping area**’ means a room or space in which people sleep.

“The term ‘**sleeping unit**’ means a room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are also part of a dwelling unit are not sleeping units.

“In the case of a building constructed on or after January 1, 2008, a carbon monoxide alarm shall be installed in each of the following locations:

“1. Within each dwelling unit or sleeping unit, on each story having a sleeping area.

“2. Within each dwelling unit or sleeping unit, on each story where a carbon monoxide source is located.

“One carbon monoxide alarm installed on a story of a dwelling unit or sleeping unit having both a sleeping area and a carbon monoxide source shall suffice for that story within that dwelling unit or sleeping unit.

“In the case of a building constructed before January 1, 2008, a carbon monoxide alarm shall be installed in each of the following locations:

“1. Within each dwelling unit or sleeping unit, on the lowest story having a sleeping area.

“When more than one carbon monoxide alarm is required to be installed within an individual dwelling unit, the alarms shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all sleeping areas over background noise levels with all intervening doors close.

“**Exception:** Interconnection is not required where carbon monoxide alarms are permitted to be battery operated in accordance with section RR313.4.2.

“All carbon monoxide alarms shall be listed and labeled as complying with UL 2034 or CAN/CSA 6.19, and shall be installed in accordance with the manufacturer's installation instructions and this code.

“RR313.4.1 **Prohibited locations.** Carbon monoxide alarms shall not be located within or near the openings to garages, bathrooms or furnace rooms. Carbon monoxide alarms shall also not be located in or near locations specified as ‘prohibited,’ ‘not recommended’ or the like in the manufacturer’s installation instructions.

“RR313.4.2 **Power source.** The required carbon monoxide alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source or an on-site electrical power system, and when primary power is interrupted,

shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection.

“Exception. Carbon monoxide alarms shall be permitted to be battery operated when installed in buildings without commercial power or an on-site electrical power system or in buildings constructed before January 1, 2008.

“RR313.4.3 Maintenance. Carbon monoxide alarms shall be maintained in an operative condition at all times, shall be replaced or repaired where defective, and shall be replaced when they cease to operate as intended.

“RR313.4.4 Disabling of alarms. Carbon monoxide alarms shall not be removed or disabled, except for service or repair purposes.

“RR313.4.5 One-family dwellings converted to bed and breakfast dwellings. One-family dwellings converted to bed and breakfast dwellings shall have carbon monoxide alarms installed in accordance with the requirements of section F611 of the Fire Code of New York State.

“RR313.4.6 Buildings under custody, licensure, supervision or jurisdiction of a department or agency of the State of New York. A building which is under the custody, licensure, supervision or jurisdiction of a department or agency of the State of New York and which is regulated as a one-or two-family dwelling or multiple single-family dwelling (townhouse), in accordance with established laws or regulations of such department or agency, shall have carbon monoxide alarms installed in accordance with the stricter of the requirements of this section or the requirements of section F611 of the Fire Code of New York State.”

Subdivision (d) of section 1225.1 in Part 1220 of Title 19 NYCRR is amended by adding a new paragraph (3) to read as follows:

(3) 2007 FCNYS section F611. For the purposes of applying the 2007 FCNYS in this State, the text of section F611 in chapter F6 of the 2007 FCNYS shall be deemed to be amended and restated in its entirety to read as follows:

“F611 CARBON MONOXIDE ALARMS

“F611.1 General. This section covers the application, installation, performance and maintenance of carbon monoxide alarms and their components in new and existing buildings and structures. The requirements of this section shall apply to all new buildings and structures and to all existing buildings and structures, without regard to the date of construction of the building or structure and without regard to whether such building or structure shall or shall not have been offered for sale.

“F611.1.1 Definitions. For the purposes of this §F611, the following terms shall have the following meanings:

“Carbon monoxide source. The term ‘carbon monoxide source’ includes fuel fired appliances, equipment, devices and systems; solid fuel burning appliances, equipment, devices and systems; all other appliances, equipment, devices and systems that may emit carbon monoxide; fireplaces; garages; and all other motor vehicle-related occupancies.

“Dwelling unit. The term ‘dwelling unit’ means a single unit providing complete, independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

“Existing buildings and structures. The term ‘existing buildings and structures’ means buildings and structures constructed before January 1, 2008.

“Multiple dwelling. The term ‘multiple dwelling’ means a dwelling which is either rented, leased, let or hired out, to be occupied, or is occupied as the temporary or permanent residence or home of three or more families living independently of each other, including but not limited to the following: a tenement, flat house, maisonette apartment, apartment house, apartment hotel, tourist house, bachelor apartment, studio apartment, duplex apartment, kitchenette apartment, hotel, lodging house, rooming house, boarding house, boarding and nursery school, furnished room house, club, sorority house, fraternity house, college and school dormitory, convalescent, old age or nursing homes or residences, and a dwelling, two or more stories in height, and with five or more boarders, roomers or lodgers residing with any one family.

“New buildings and structures. The term ‘new buildings and structures’ means buildings and structures constructed after December 31, 2007.

“The term ‘sleeping area’ means a room or space in which people sleep.

“The term ‘sleeping unit’ means a room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are also part of a dwelling unit are not sleeping units.

“F611.2 Equipment. Carbon monoxide alarms shall be listed and labeled as complying with UL 2034 or CAN/CSA 6.19, and shall be installed in accordance with the manufacturer's installation instructions and this section.

“F611.2.1 Combination smoke and carbon monoxide alarms. Combination smoke and carbon monoxide alarms are permitted, provided the alarm is listed for such use. Combination smoke and carbon monoxide alarms shall have distinctly different alarm signals for smoke or carbon monoxide alarm activation.

“F611.3 Where required. Single and multiple station carbon monoxide alarms shall be provided in the locations described in this section.

“Exception: Compliance with this section is not required where no carbon monoxide source is located within or attached to the structure. However, compliance with

this section is required if any carbon monoxide source is subsequently located within or attached to the structure.

“F611.3.1 New buildings and structures: one-and two-family dwellings, multiple single-family dwellings (townhouses), and buildings owned as a condominium or cooperative and containing dwelling accommodations. A carbon monoxide alarm shall be installed in each of the following locations:

“1. Within each dwelling unit or sleeping unit, on each story having a sleeping area.

“2. Within each dwelling unit or sleeping unit, on each story where a carbon monoxide source is located.

“One carbon monoxide alarm installed on a story of a dwelling unit or sleeping unit having both a sleeping area and a carbon monoxide source shall suffice for that story within that dwelling unit or sleeping unit.

“F611.3.2 New buildings and structures: Group I-1 occupancies. A carbon monoxide alarm shall be installed in the each of following locations:

“1. On each story having a sleeping area.

“2. On each story where a carbon monoxide source is located.

“One carbon monoxide alarm installed on a story having both a sleeping area and a carbon monoxide source shall suffice for that story.

“F611.3.3 New buildings and structures: Group R occupancies not covered by section F611.3.1 or section F611.3.2, nursery schools (with sleeping units) not covered by section F611.3.1 or §F611.3.2, bed and breakfast uses not covered by section F611.3.1 or section F611.3.2, and multiple dwellings not covered by section F611.3.1 or section F611.3.2. A carbon monoxide alarm shall be installed in each of the following locations:

“1. In each dwelling unit or sleeping unit where a carbon monoxide source is located. In a multiple-story dwelling unit or sleeping unit, a carbon monoxide alarm shall be installed on each story having a sleeping area and on each story where a carbon monoxide source is located. One carbon monoxide alarm installed on a story having both a sleeping area and a carbon monoxide source shall suffice for that story.

“2. In each dwelling unit or sleeping unit that is on the same story as a carbon monoxide source.

“F611.3.4 Existing buildings and structures: one-and two-family dwellings, multiple single-family dwellings (townhouses), and buildings owned as a condominium or cooperative and containing dwelling accommodations. A carbon monoxide alarm shall be installed within each dwelling unit or sleeping unit on the lowest story having a sleeping area.

“F611.3.5 Existing buildings and structures: Group I-1 occupancies. A carbon monoxide alarms shall be installed on each story having a sleeping area.

“F611.3.6 Existing buildings and structures: Group R occupancies not covered by section F611.3.4 or section F611.3.5, nursery schools (with sleeping units) not covered by section F611.3.4 or section F611.3.5, bed and breakfast uses not covered by section F611.3.4 or section F611.3.5, and multiple dwellings not covered by section F611.3.4 or section F611.3.5. A carbon monoxide alarm shall be installed in each of the following locations:

“1. In each dwelling unit or sleeping unit where a carbon monoxide source is located. In a multiple-story dwelling unit or sleeping unit, a carbon monoxide alarm shall be installed on the lowest story having a sleeping area.

“2. In each dwelling unit or sleeping unit that is on the same story as a carbon monoxide source.

“F611.3.7 **Work completed** within one-and two-family dwellings, multiple single-family dwellings (townhouses), buildings owned as a condominium or cooperative and containing dwelling accommodations, Group R occupancies, bed and breakfast uses not covered by section F611.3.8, and multiple dwellings not covered by section F611.3.8. Where work includes the addition or installation of a carbon monoxide source, the construction of a chimney, or the connection of the building to a garage or to any other motor vehicle-related occupancy, a carbon monoxide alarm shall be installed within each dwelling unit or sleeping unit on the lowest story having a sleeping area.

“F611.3.8 **Work completed within Group I-1 occupancy.** Where work includes the addition or installation of a carbon monoxide source, the construction of a chimney, or the connection of the building to a garage or to any other motor vehicle-related occupancy, a carbon monoxide alarm shall be installed on each story having a sleeping area.

“F611.4 **Prohibited locations.** Carbon monoxide alarms shall not be located within or near the openings to garages, bathrooms, or furnace rooms. Carbon monoxide alarms shall also not be located in or near locations specified as ‘prohibited,’ ‘not recommended’ or the like in the manufacturer’s installation instructions.

“F611.5 **Power source.** When the building wiring is served from a commercial or on-site power source, carbon monoxide alarms shall receive their primary power from the building wiring and, when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection.

“**Exceptions:**

“1. Carbon monoxide alarms installed in buildings without a commercial or on-site power source shall be permitted to be battery operated.

“2. In existing buildings and structures, cord-type, direct plug, or battery-operated carbon monoxide alarms shall be permitted.

“F611.6 **Interconnection.** When more than one carbon monoxide alarm is required to be installed within an individual dwelling unit or sleeping unit, the alarms shall be interconnected.

“**Exception:** Interconnection is not required where cord-type, direct plug, or battery-operated carbon monoxide alarms are permitted.

“F611.7 **Maintenance.** Carbon monoxide alarms shall be maintained in an operative condition at all times, shall be replaced or repaired where defective, and shall be replaced when they cease to operate as intended.

“F611.8 **Disabling of alarms.** Carbon monoxide alarms shall not be removed or disabled, except for service or repair purposes.”

APPENDIX F

Properties & General Combustion Characteristics of Natural Gas

Pipeline natural gas is one of the most popular fuel choices today. It is called “natural gas” because it is found in the earth as a natural material generated as a result of decaying organic matter. Most pipeline natural gas is called “associated gas” because it is a co-product associated with the oil recovery process. However, other sources of supply include coal bed methane, landfill methane, non-associated gas directly recovered from gas drilling operations, imported re-gasified liquefied natural gas (LNG) and refinery gases. Pipeline natural gas varies in composition depending on the geographic location the gas is being utilized. In fact, one of the many positive attributes of pipeline natural gas is that it can be mixed and blended from various sources and delivered through the interstate pipeline system as a “combined product” sufficient for most end use applications.

However, if the composition of natural gas supplied within a distribution system varies significantly, adjustments to appliances and other devices may be required. Other adjustments that must be considered, although not an issue for most areas served by National Grid, is the effect of elevation on combustion as appliances are certified and tested at sea level and do not take into account the effects elevation has on measured gas / air density. Fortunately, in most cases, after the original installation and adjustment, further adjustments are not necessary if the appliance is installed and maintained properly in accordance with the Manufacturers recommendations and standard good industry practices.

Most pipeline natural gas supplied in commerce is composed of 80-95% methane which is the principal constitute of natural gas. Methane is the same substance produced via decay of organic matter in some swamps, sewers and landfills however, unlike gas from these sources pipeline natural gas contains other hydrocarbon and non-hydrocarbon constituents including:

- Ethane
- Propane
- Butane(s)
- Pentane(s)
- Hexane(s)
- Trace hydrocarbon constituents
- Carbon Dioxide
- Nitrogen
- Trace Sulfur Compounds including gas odorants
- Moisture

Important parameters that describe the combustion characteristics of pipeline gas that are calculated from the composition constituents include:

Gross Heating Value (also called the “higher heating value” or “heat content”) – the amount of energy per standard cubic foot of gas transferred as heat from the complete, ideal combustion of the gas with air, at standard temperature, where all the water formed by the combustion reaction condenses to liquid.

Relative Density (ideal specific gravity) – the ratio of the specific weight of a gas to the specific weight of dry air at the same conditions of pressure and temperature. It is simply the average molecular weight of the gas divided by the average molecular weight of the gas.

Wobbe Index (also called the interchangeability factor) – a numerical value that is determined by dividing the square root of the relative density (a key orifice flow parameter) into the heat content (or Btu per standard cubic foot) of the gas. Basically, the Wobbe Index indicates the relative amount of energy that would flow through a small burner orifice jet.)

It should be noted that pipeline natural gas is non-toxic although sometimes listed as a “hazardous material” due to its flammability. Pipeline natural gas is also typically 40% lighter than air (if air is assumed to have a specific gravity of 1, natural gas would then have a specific gravity of approximately .6 depending on the composition as stated above).

Generally speaking, typical pipeline natural gas distributed in National Grid’s service territory can have heating values in the 1010 – 1060 Btu/scf range with a specific gravity ranging from .58 to .62. This can result in a Wobbe Index range of approximately 1321 – 1360. It should be noted that gas compositional changes may occur and typically should not result in Wobbe Index variations in excess of +/- 4% of the typical adjustment gas, or historical supply at the time of installation. It is anticipated that delivered compositions will not vary above a maximum Wobbe Index of 1,400 and a heating value of 1,110 Btu/scf.

Due to possible variations in composition and resulting combustion parameters, it is important to follow the Manufacturers instructions for properly adjusting burners and setting appliances “on rate”. Failure to do so may result in an over firing condition, combustion problems and lost efficiency. It is the responsibility of the installer to ensure appliances are installed correctly and properly adjusted for the gas received at the time of installation.

Pipeline natural gas used for combustion processes other than household appliances should consult and follow engineering & installation guidelines as to setting combustion devices “on-rate”. Other applications including refueling stations, vehicle and stationary engines also need to consider the above mentioned potential variations in fuel composition and resulting combustion parameters.

It is important to note that all combustion devices should be maintained in proper working order and inspected regularly to ensure continued safe and efficient operation.