



Gas Service Handbook

**COMMERCIAL/INDUSTRIAL &
MULTIFAMILY DEVELOPMENTS**

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PREFACE

What this handbook contains

This handbook contains common information on nonresidential service which includes:

- Commercial and industrial buildings
- Apartment complexes
- Multifamily structures

MGE's service territory map

For your reference, the Territory Map in *Appendix A* provides the general boundaries for MGE's natural gas service.

Glossary of terms

For your convenience, glossary terms appear in bold italics throughout the handbook the first time they are referenced (*e.g., meter*).

Scheduling

The time needed for engineering, scheduling, and construction of the work will vary depending upon the complexity of the job and the volume of work requested by MGE customers. Contact your operations scheduling representative at (608) 252-7373 for current construction scheduling.

Codes and jurisdictions

This handbook shall not be interpreted to conflict with the regulations of the State of Wisconsin or other regulatory bodies having jurisdiction. MGE's requirements may be more stringent. Local codes and requirements related to the planned work should be addressed before any construction begins.

How to contact MGE

Please direct any technical questions regarding the information in this booklet to MGE's Gas Engineering Department at (608) 252-7933 or (608) 252-7931.

If you have any general billing questions regarding your account, contact one of our customer service representatives at (608) 252-7222 or 1-800-245-1125 from 7:00 a.m. to 7:00 p.m. weekdays. You may also contact us by e-mail at mge@mge.com.

MGE's service providers

MGE contracts with a partner company, KS Energy, to provide construction services. The project manager and employees who install your service may work for these service providers on MGE's behalf.

OVERVIEW:

BRINGING NATURAL GAS TO YOUR BUILDING SITE

This checklist notes the steps to bring natural gas to your construction site. The information in this handbook applies to MGE customers who require new nonresidential natural gas service. If additional information is needed, contact a local MGE customer construction services representative.

GAS ENGINEERING DEPARTMENT

Commercial/Industrial and Multifamily Customer Responsibilities:

- Call MGE Gas Engineering Department to determine if a natural gas main is located near your building site.
- Decide on your gas equipment and inform MGE of its requirements.
 - ✓ MGE offers different delivery pressure options that depend upon equipment load and equipment pressure requirements, which may result in special meter set and customer installation requirements.
- Complete and return the Gas Service Application (*provided by an MGE representative*) via:
 - ✓ The internet at https://www.mge.com/my_mge/serviceforms/installation/service-installation.asp
 - ✓ Fax to MGE New Services at (608) 252-5623, or
 - ✓ Mail to:
**Madison Gas and Electric Co.
New Services
Post Office Box 1231
Madison, Wisconsin 53701-1231**
- Provide MGE Gas Engineering Department with an approved, complete set of civil site

plans (*if new construction*) and the legal description or tax parcel identification.

- Call MGE after your fuel line has been inspected and approved by your city or county building department so MGE may unlock the valve, turn on the meter, and light your appliances (*if necessary*).
 - ✓ Removal of the lock or operation of the shutoff valve may damage this equipment. Only authorized MGE personnel can remove the lock and operate the valve.

MGE's Responsibilities:

- Determine and inform you of gas availability.
- Perform an economic feasibility study, if applicable.
- Notify you of:
 - ✓ Charges, if any.
 - ✓ Right-of-way or easement requirements.
 - ✓ Additional permit requirements, if necessary.
- Install the natural gas main, service, and meter set assembly.
- Turn on and test your natural gas meter.

Scheduling:

- Scheduling will be based on a mutually agreed-upon time frame that is consistent with your needs, permit requirements, and design criteria.

CHAPTER 1

STEPS TO A SMOOTH INSTALLATION

The basics: understanding the installation

Before MGE installs your natural gas facilities, it is important to understand the overall components of an installation. You are responsible for your natural gas fuel line and appliance hookup. MGE is responsible for the installation of the natural gas main, service, and meter (see Figure 1).

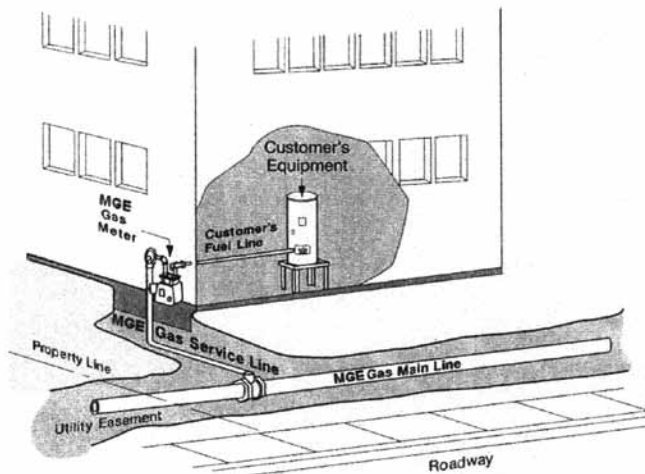


Figure 1. Example of typical gas system components.

Getting started with the installation process

Before the installation process can begin, you need to know the following:

Is there a gas main located near your site?

To determine if a natural gas main is located near your building site, call MGE Gas Engineering at (608) 252-7933 or (608) 252-7931.

If there is no gas main located near your building site, MGE will need to review and estimate the feasibility of extending gas facilities to you. If MGE determines that extending a gas main to you is needed, main extension charges may apply.

What natural gas equipment will be installed in your new facility?

Next, you will need to decide what natural gas equipment will be installed so you can inform MGE of your estimated natural gas load. Evaluate your total natural gas load by adding up the Btu inputs for all equipment being installed (immediate and future), and tell us the desired pressure delivery at the point of connection to the meter.

Remember, besides space and water heating, natural gas can be used for air-conditioning, clothes drying, cooking, pool and spa heating, barbecues, fireplaces, patio heaters, and generators. Be sure to consider all the options.

Customer fuel line

The fuel line is the gas piping (*installed, owned, and maintained by the customer*) that runs from the meter to the customer's equipment. There are three types of fuel lines you can use:

- 1. Rigid steel piping.** Typically, threaded, rigid steel pipe is used for natural gas piping. This type of pipe has been used in the gas industry for a long time and is a reliable alternative for house piping.
- 2. Flexible corrugated stainless steel tubing** (*may require two-pound pressure delivery*). This is a new alternative that is gaining popularity because of ease of installation. Although flexible, corrugated stainless steel tubing (CSST) and fitting material is more expensive to purchase than rigid steel pipe.

3. Flexible copper tubing (*may require two-pound pressure delivery*). Since its code approval, flexible copper tubing (*Type K or L copper with 1,000° silver-soldered joints*) has received positive feedback from contractors. Copper tubing is another good alternative for natural gas house piping that is flexible and reliable.

NOTE: The International Fuel Gas Code regulates the design and installation of fuel lines and appliances. The International Fuel Gas Code also contains charts to correctly size your fuel line. Use this book as a reference when designing your gas lines. It will be your responsibility to ensure that a mechanical permit or a gas piping permit is obtained from your city or county building department and that the building department performs an inspection of the completed installation.

Underground fuel line piping

Fuel gas piping between your gas meter and your natural gas appliances or equipment, in most cases, will belong to you. If any of this piping runs underground, such as to serve a hot tub, pool, shop, other building or for a natural gas fueled standby generator, it needs to be maintained. It is your responsibility to maintain this piping.

If your buried piping is not maintained, it may leak or corrode. Be sure to periodically inspect buried pipes for leaks, and if the piping is metallic, inspect for corrosion. Make sure repairs are done immediately to correct any unsafe condition. A corrosion control company or a plumbing or heating contractor can help inspect and repair it.

If you plan to excavate near your buried piping, it should be located in advance and the excavation should be done by hand. A locating service can help locate the piping if you are not sure of its location. For free locating of utility-owned lines (typically from the street to your meter), call Diggers Hotline three business days in advance at 1-800-242-8511.

If you smell the rotten egg smell of odorized natural gas, call MGE any time, 24 hours a day, at (608) 252-1111 or 1-800-245-1123 and we will check it for you. For emergencies, call 9-1-1.

Caution: *When excavating near buried gas piping, locate the piping first and excavate by hand.*

Factors that can delay installation

No one wants to have their project delayed. We have identified the following circumstances as common impediments to installing service lines:

- Debris in the work area or along the route of the proposed service extension.
- Building is not framed and sided at the meter location for the meter set assembly installation.
- Requested meter location is not usable or fails to meet minimum clearances (see Chapter 4, Selecting a gas meter location).
- The foundation is not sufficiently back-filled to support the meter or service piping.
- Alterations that must be made to meet local codes are not completed.
- In some cases, MGE will require a concrete pad to support the gas meter.

Job site safety requirements

In case of emergency involving a service line or main break, call our Customer Service Center at 1-800-252-1111 and 9-1-1.

MGE asks that customers follow these safety requirements:

- Buildings should be framed and sided at the meter location before we can set a gas meter. MGE may not install meter set assemblies against foundations only.
- A meter may be installed, but gas will not be turned on until your fuel line has been pressure tested and an approved permit has been obtained from and signed off by the local administrative authority.
- Our crew will ask you to extinguish any smoking material or open flame that presents a danger to the operation prior to a line purge.

Locating other utilities

State law requires that anyone planning to dig must notify Diggers Hotline three working days before you dig: 1-800-242-8511.

The locator uses the following color codes to identify underground utilities:

Color	Utility
Yellow	Gas, oil, steam, petroleum, or gaseous materials
Red	Electric power lines, cables, conduit, and lighting cables
Orange	Communication, alarm, or signal lines; cables, conduit, cable TV
Blue	Water, irrigation, and slurry lines
Green	Sewers and drain lines
White	Proposed excavation
Pink	Temporary survey markings

CHAPTER 2

CODES AND PROPERTY ISSUES

Relevant inspections and local codes

This handbook provides most of the information and requirements needed to bring natural gas to your building site. However, it does not include all possible standards and specifications required by MGE or state, federal, or local code. If you need additional information, contact your MGE representative, your local government agency, or state authority.

This handbook shall not be interpreted to conflict with the regulations of the State of Wisconsin or other regulatory bodies having jurisdiction. MGE's requirements may be more stringent. Local codes and requirements related to the planned work should be addressed before any construction begins.

Easements and public right-of-way issues

As part of the installation process, MGE will:

- Apply for any necessary easements prior to installation using the customer's information.
- Apply for all necessary permits for the portion of the work done in the public right-of-way.
- Request Diggers Hotline utility locations.
- Dig trench to install all necessary gas facilities.
- Backfill and be responsible for the trench dug to install gas facilities.
- If MGE is digging the trench on private property, MGE will provide and install the bedding material to protect the pipe.

CHAPTER 3

NATURAL GAS INSTALLATION

Ordering gas service

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To order individual service lines, call our New Service Installation Department at (608) 252-7373 or complete a **Gas and Electric Service Application** with the following information:

- Service address, including suite number
- Engineering site plan with corresponding meter location
- Pressure required at meter connection point
- Loads for each individual meter
- Contact name and mailing address

Bringing the natural gas main to a new commercial, industrial, or multifamily facility

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Step 1: Application process

Please complete and sign the Application for Service and provide MGE with an original scaled copy of the approved site plan(s) drawings and, if available, a disk with the electronic files of the plans in a **.dgn** or **.dwg** file format. Include lot lines and driveways and omit extraneous information.

Step 2: Design process

MGE creates the design for gas main, gas service, and metering to serve your facility and applies for appropriate easements and permits. This process averages four to six weeks.

Step 3: Construction scheduling process

When ready, please call a construction scheduling representative to discuss your anticipated construction schedule.

TYPICAL GAS MAIN TRENCH

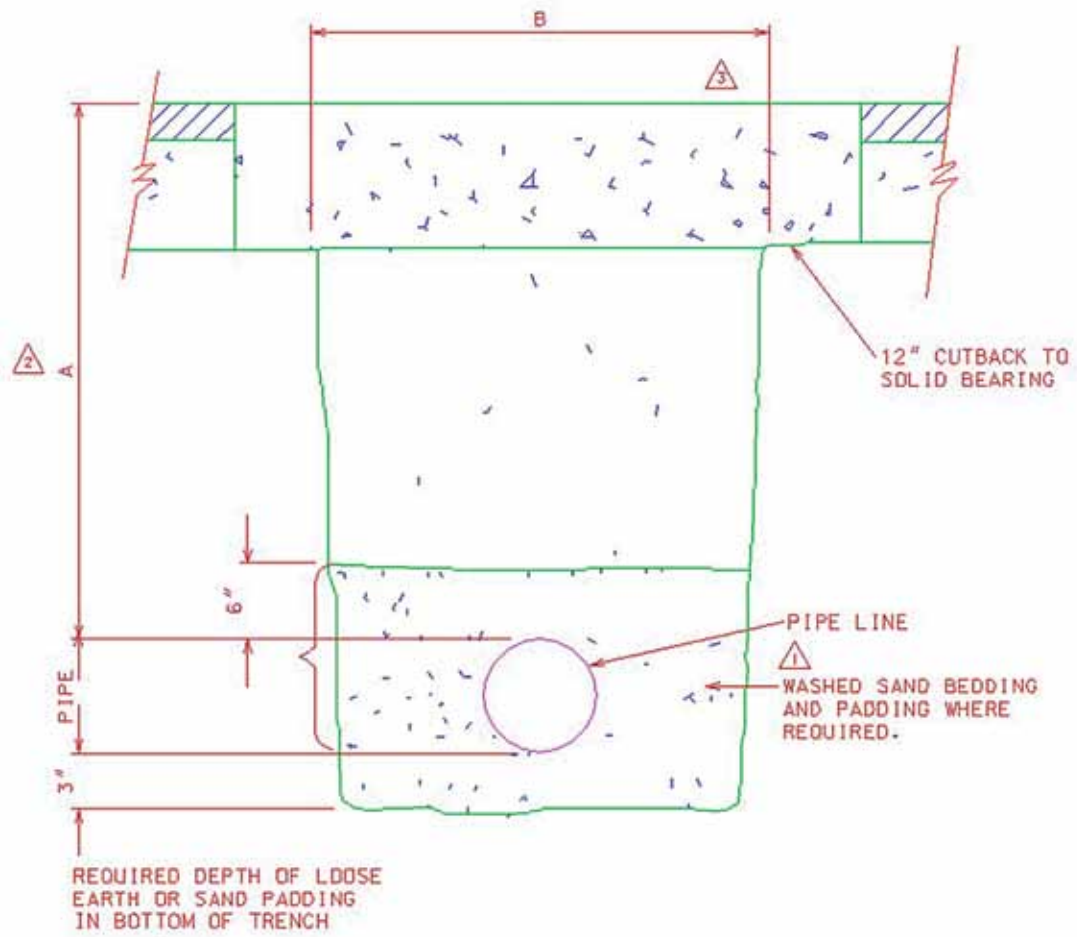


Figure 2. Typical commercial gas main line trench.

TYPICAL GAS SERVICE LINE

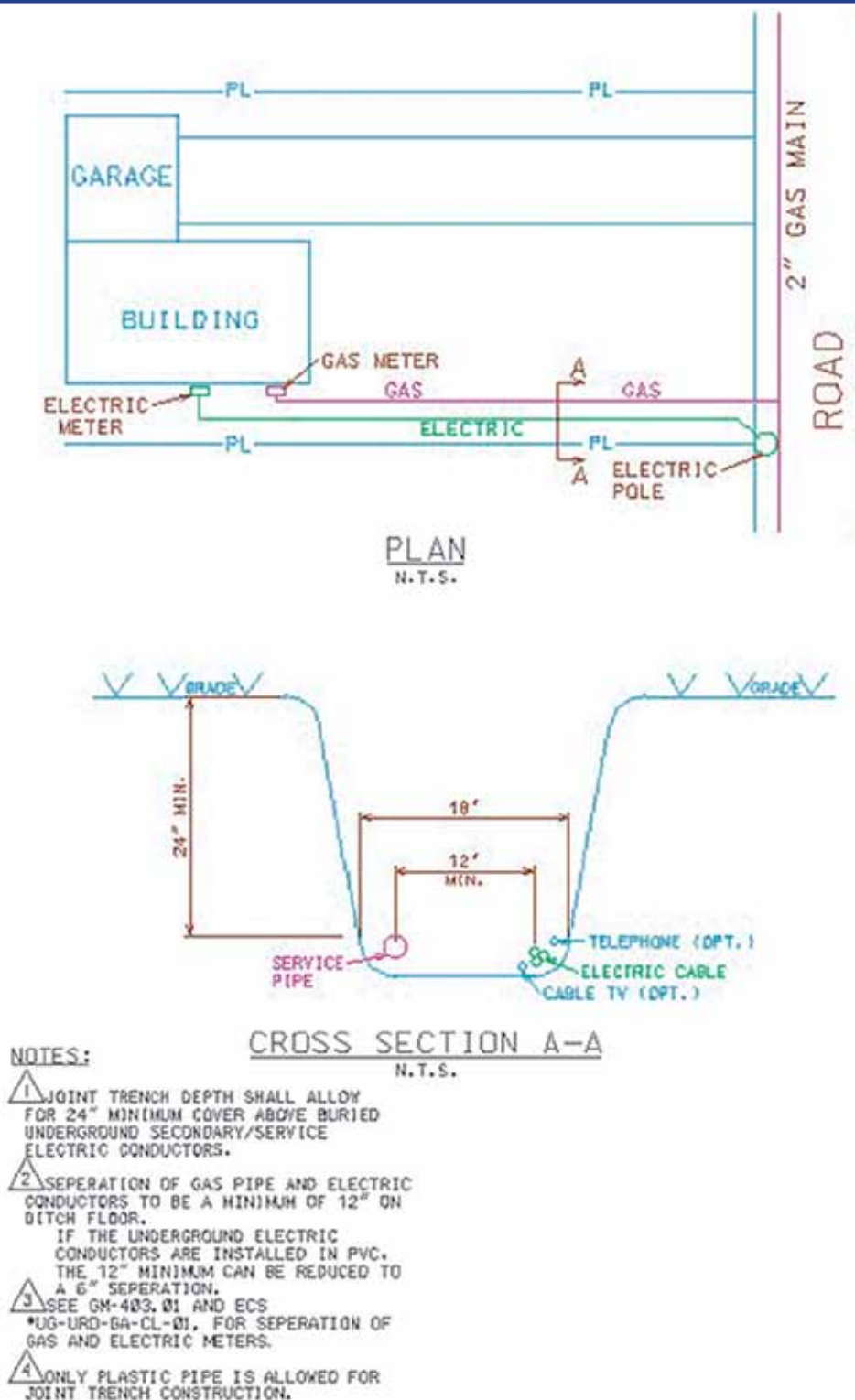


Figure 3. Typical commercial/industrial/multifamily joint utility service trench with customer-installed gas service conduit.

CHAPTER 4

METER INSTALLATION

Before MGE can start the natural gas meter installation, you must mark the gas meter location on engineering plans for design of your meter set.

Selecting a gas meter location

Safe installation and operation of your gas service equipment is MGE's primary concern. An approved natural gas meter location is one that is in accordance with regulatory requirements and meets MGE's construction standards. A good meter location is one where the meter is:

- Easy to read and inspect.
- Accessible for turn on, shut off, maintenance, change, or removal.
- Protected against electric sparks, excessive temperatures, flames, and mechanical damage.
- Adequately ventilated.
- Protected against vehicular damage.

Required location

MGE encourages you to locate the meter outside, alongside the building, and close to the source of gas supply.

NOTE: Inside meter locations are used only with MGE's approval.

Locations to avoid

The following meter locations present access problems or could expose the meter to accidental damage. We require you avoid the following locations:

- Public passageways or fire escape routes.
- Under a stairway or walkway.
- On building rooftops.
- Unventilated, confined, or inaccessible places.
- Under openable windows (*because of regulator relief*).
- Directly adjacent to vehicular driveways, delivery doors, or high traffic areas where the meter may be subjected to vehicular damage. (*Guard posts may be required if such locations are unavoidable. See Guard post and curb requirements section.*)
- Near electrical transformers or control rooms.
- Within 3 feet of sources of ignition (such as furnaces, water heaters, switch boxes, fuse boxes, breaker panels, or electrical outlets where arcing can occur).
- Within 10 feet of any air intake.

NOTE: Talk to your local MGE gas engineer for protection that may be required for your meter from flooding, snow, or ice.

Minimum meter clearance requirements

Minimum clearances are measured from the relief vent on the gas meter set assembly or the relief valve stack (*Figures 4 and 5*).

The relief vent or stack exhausts natural gas safely into the atmosphere in the event the regulator on the meter fails to work properly. The diagrams and measurements provided show the required minimum distances between building features and the relief vent.

Meter set assembly selection

To begin the meter set selection process, fill out the Application for Gas and Electric Service provided by the MGE representative. The information on the worksheet helps the MGE representative determine the maximum and minimum load and delivery pressure of the natural gas service.

Meter set assembly selection is determined by the customer's immediate needs. This optimizes meter accuracy and minimizes installation costs.

However, if a customer plans to add load in the near future and if the meter set assembly sized for the future load will adequately measure the present load, MGE will specify a meter set assembly based on the future load.

The most common meter set assemblies are the diaphragm and rotary (*Figures 4, 5, and 6*). If your commercial structure has multiple tenants, you may require a manifold meter set (*Figures 7 and 8*).

Your individual installation may be different.

TYPICAL GAS METER SET ASSEMBLY FOR SMALL LOADS

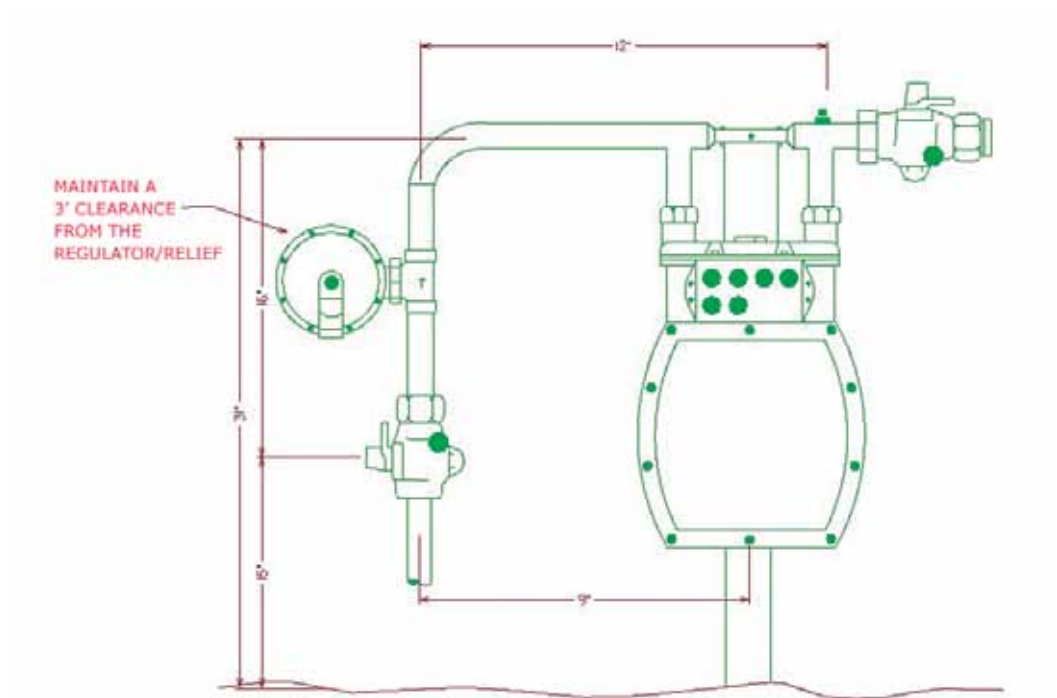


Figure 4. Typical 250 gas meter set assembly for small loads.

TYPICAL SMALL COMMERCIAL GAS METER

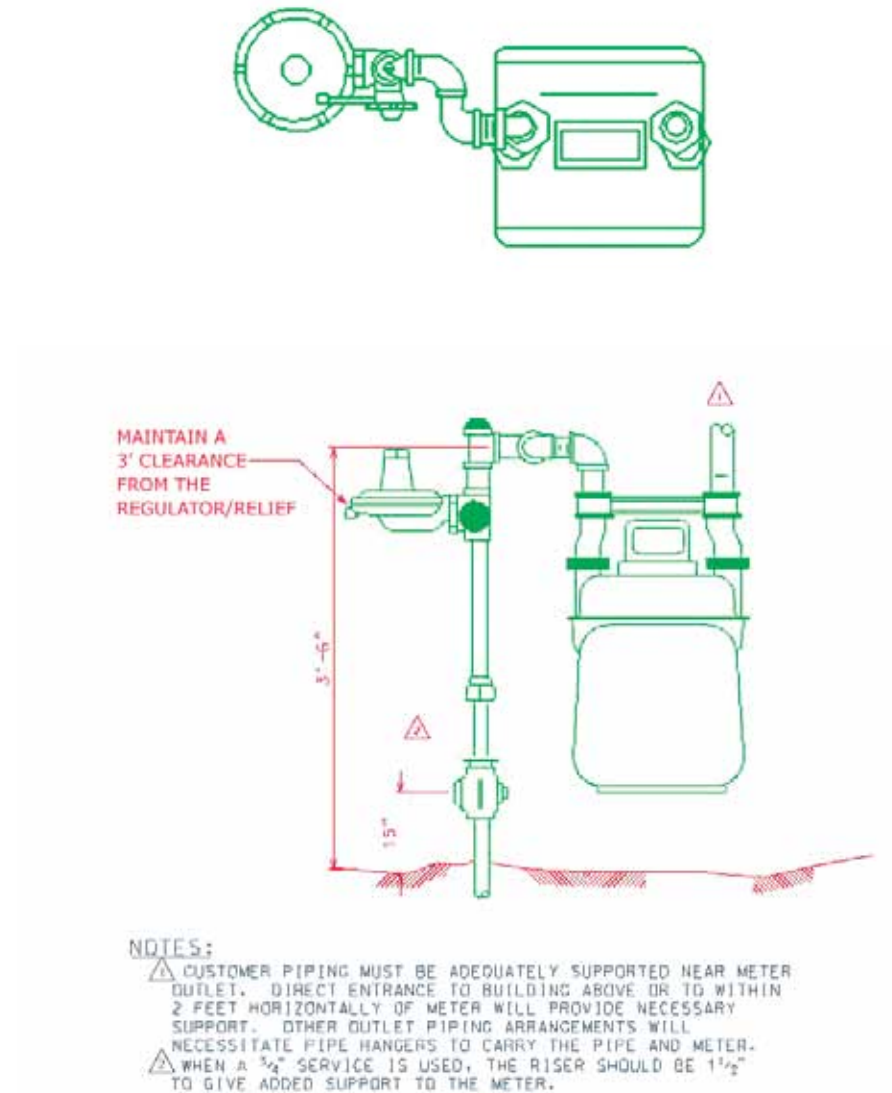


Figure 5. Typical 425 through 1000 gas meter set assembly.

TYPICAL LARGE COMMERCIAL GAS METER

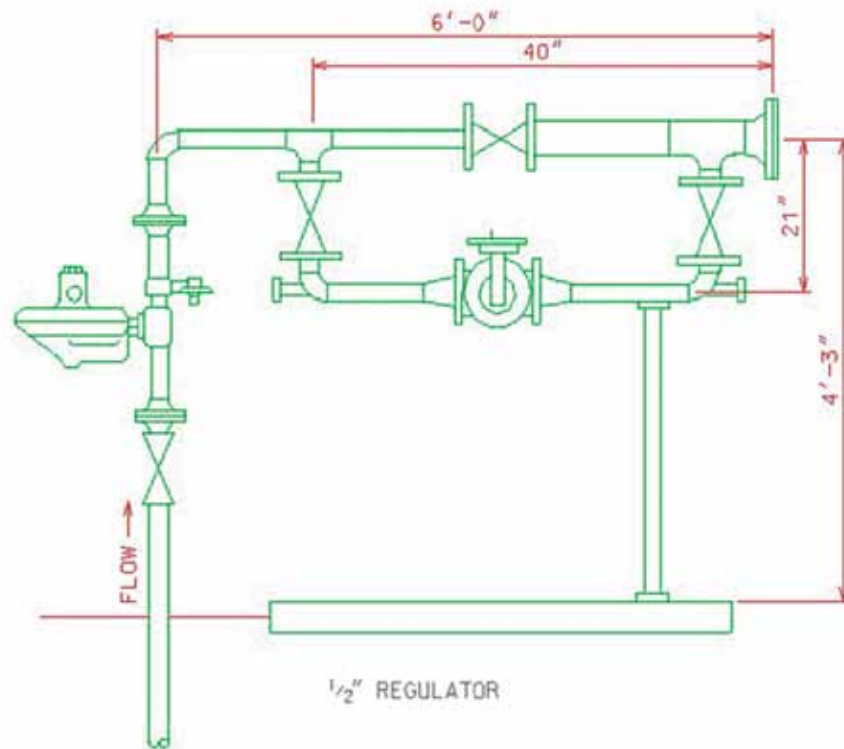


Figure 6. This is a typical outside meter rack. This installation could be put inside the building, but the meter location needs verification by MGE's Gas Engineering Department. This rack will extend on an outside wall from left to right or right to left depending on available space. MGE would prefer the gas regulating equipment to be outside, but if circumstances dictate it being inside, we will consider installing it with the meter set. The wall to the front face of the meter is approximately 3 feet. MGE requires the contractor to install meter protection posts and brackets to protect the rack/meter from damage. All designs of this and clearances will be verified by the Gas Engineering Department. MGE also requires the contractor to core holes in the wall of the building so associated gas pipes can be installed in the basement and vent lines can exit. Exact size and placement will be agreed on at the time of installation. This drawing is to be used as a general reference by engineers, architects, and designers. Loads and meters vary, so actual gas meter racks will likewise vary. Actual design can be verified with the Gas Engineering Department along with questions as to design and placement.

TYPICAL APARTMENT METER BANK (THREE HIGH)

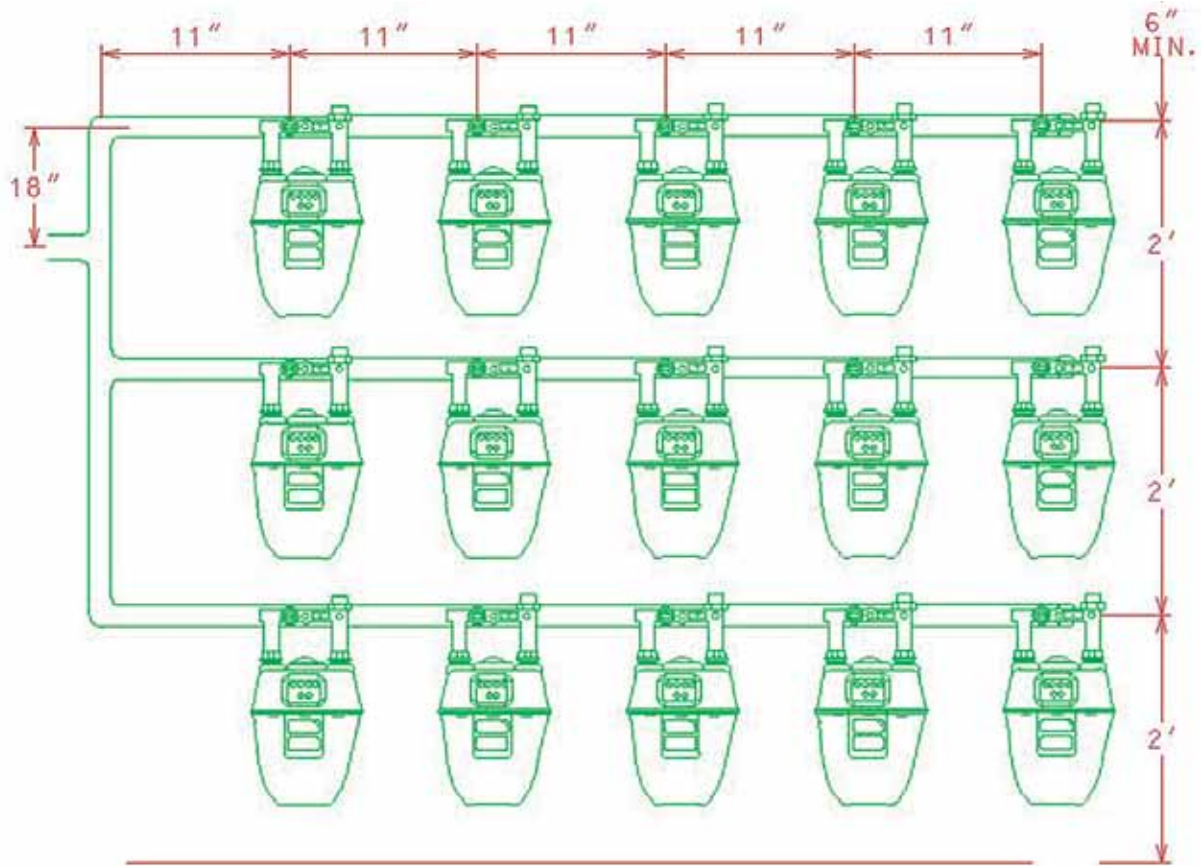


Figure 7. This is a typical inside meter rack where the floor-to-ceiling height is less than 8 feet. MGE would install the rack on an outside wall with meter rows going three high and extending out to accommodate the number of meters desired. This rack will either extend from the wall penetration and go left to right or right to left depending on available space. The dimensions are relatively accurate, but verification of room needs to be done by MGE's Gas Engineering Department. MGE would prefer the gas regulating equipment to be outside, but if circumstances dictate it being inside, we will consider installing it with the meter set. The wall to the front face of the meter will be approximately 18 inches. MGE requires the contractor to install meter protection posts and brackets to protect the rack/meters from damage. All designs of this and clearances will be verified by the Gas Engineering Department. MGE also requires the contractor to core holes in the wall of the building so associated gas pipes can be installed in the basement and vent lines can exit. Exact size and placement will be agreed on at the time of installation. This drawing is to be used as a general reference by engineers, architects, and designers. Loads and meters vary, so actual gas meter racks will likewise vary. Actual design can be verified with the Gas Engineering Department along with questions as to design and placement.

TYPICAL APARTMENT METER BANK (FOUR HIGH)

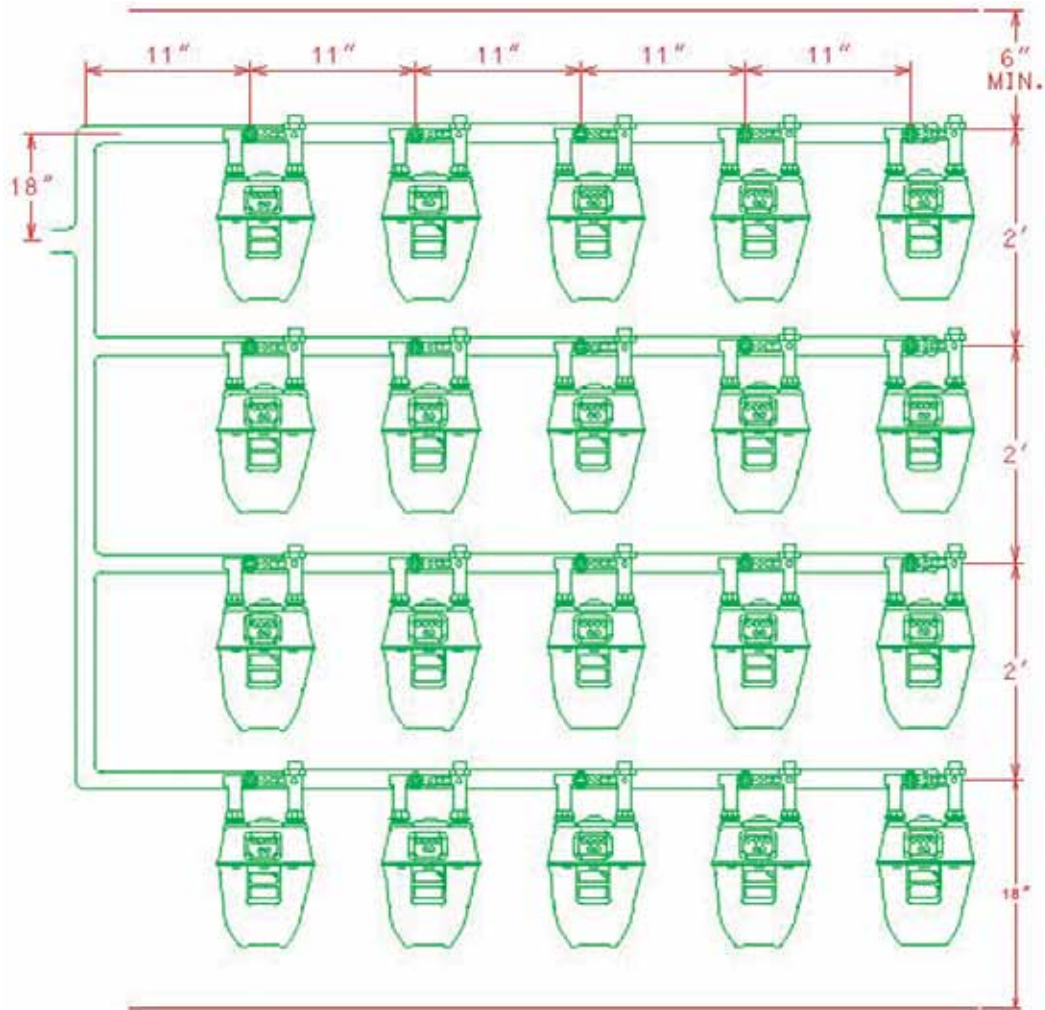


Figure 8. This is a typical inside meter rack where the floor-to-ceiling height is 8 feet or more. MGE would install the rack on an outside wall with meter rows going three high and extending out to accommodate the number of meters desired. This rack will either extend from the wall penetration and go left to right or right to left depending on available space. The dimensions are relatively accurate, but verification of room needs to be done by MGE's Gas Engineering Department. MGE would prefer the gas regulating equipment to be outside, but if circumstances dictate it being inside, we will consider installing it with the meter set. The wall to the front face of the meter will be approximately 18 inches. MGE requires the contractor to install meter protection posts and brackets to protect the rack/meters from damage. All designs of this and clearances will be verified by the Gas Engineering Department. MGE also requires the contractor to core holes in the wall of the building so associated gas pipes can be installed in the basement and vent lines can exit. Exact size and placement will be agreed on at the time of installation. This drawing is to be used as a general reference by engineers, architects, and designers. Loads and meters vary, so actual gas meter racks will likewise vary. Actual design can be verified with the Gas Engineering Department along with questions as to design and placement.

Meter installation and turn on

Figures 4 and 5 (see pages 14 and 15) show a typical small-load gas meter installation after the meter has been turned on.

When MGE installs the gas meter, the following components will be installed.

Before the gas meter can be turned on, the fuel line shall be inspected and approved (permit signed and approved by the local administrative authority).

The customers' gas piping shall be connected to the meter and at least one piece of utilization equipment. MGE will not set the meter if the appliances are not vented correctly. Also, to assist in establishing your service, the unit number being served by a particular meter needs to be marked on the meter bar as well as the doorway.

To arrange for the gas meter turn on, please call MGE at (608) 252-7222. Call by 3:00 p.m. for same-day gas meter turn on for up to two meters. For facilities with more than two meters, call MGE to schedule meter turn on.

NOTE: This applies on regular business days, subject to delays associated with major storms, supply interruptions, or other adverse events beyond MGE's control.

Guard post and curb requirements

For commercial/industrial and multifamily meters, guard posts shall be, at a minimum:

- 4-inch diameter steel pipe, 6-foot long, filled with wet concrete.
- Each guard post shall be embedded in a minimum of a 15-inch diameter by 30-inch high concrete base with at least 24 inches of the guard post encased in the base.

- See Figure 9 for guard post spacing requirements. Maximum spacing is required to protect meter set assembly and service riser from damage.
- Do **not** install a guard post in line with or to the sides of the gas meter in order to ensure proper access for maintenance.

In cases where the meter will be installed behind a curb, observe the following:

- If there is less than 5 feet between the curb and the meter, guard posts shall be installed per Figure 9.
- Other guard post designs will be considered. Please contact MGE Gas Systems Engineering at (608) 252-7933 or (608) 252-7931 to discuss those options.

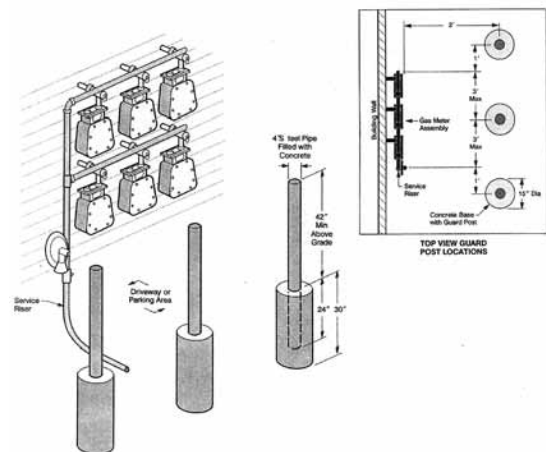


Figure 9. Commercial/industrial and multifamily meter guard post requirements.

CHAPTER 5

PRESSURE GAS

What is ‘pressure gas?’

The standard delivery pressure for MGE is 8 inches of water column (*w.c.*), which is approximately one-quarter pound per square inch (*psi*). This is the lowest delivery pressure provided by MGE. Anything higher than 8-inch *w.c.* is considered “pressure gas” or “pressure delivery.”

In addition, 8-inch *w.c.*, the most common pressures used by multifamily, commercial, and industrial customers, are 2 psi and 5 psi. (*Higher pressures are also available by special request based on application.*)

NOTE: Pressures other than those listed above require special review and approval by MGE.

If you desire pressure delivery, discuss the requirements with your customer service representative.

Requirements for pressure delivery

For your safety and to maintain system integrity, the following basic requirements must be met before MGE can provide you with pressure delivery:

- MGE must be assured that providing such service is not detrimental to the Company or its other customers.
- Your use of such service is or will be in accordance with MGE’s rates, tariffs, and standards.

Upgrading facilities to accommodate pressure delivery

Occasionally, existing MGE gas facilities (such as mains, services, or meter set assemblies) are not adequate to meet the new or additional pressure delivery requirements of multifamily, commercial, or industrial customers. Existing customer-owned fuel line and other equipment may also be undersized if load is being added.

There are various solutions to this problem. MGE may choose to:

- Increase the size or pressure of the gas mains.
- Increase the size of the service piping.
- Increase the metering capacity of the existing meter set assembly.

At times, the costs to make these changes are the customer’s responsibility. At other times, the responsibility for these costs is that of MGE. Please contact MGE to make this determination.

APPENDICES

Appendix A

- MGE's Natural Gas Service Territory Map

Appendix B

- Natural Gas Safety

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APPENDIX B

NATURAL GAS SAFETY

What is natural gas?

Natural gas is 96 percent methane, a natural compound formed as plants, trees, and other organic matter break down. While natural gas is combustible, it ignites only within a narrow range between 4 and 14 percent gas-in-air mixture. In smaller or greater concentrations, it will not burn. For this reason, natural gas is a more stable fuel source than propane or gasoline. The exhaust from a properly working natural gas appliance is essentially carbon dioxide and water vapor—the same substances released when we exhale.

Natural gas is colorless and has no smell in its natural state. A harmless odorant, mercaptan, is added to create a distinct scent, so it is easy to detect even the smallest natural gas leak. In addition, natural gas is 40 percent lighter than air. Unlike propane, which will tend to pool close to the ground, if natural gas escapes, it will rise and dissipate safely into the atmosphere.

Things to know about natural gas safety

When using any energy source, it is wise to be aware of and follow certain precautions to keep yourself and those around you safe. Here are some of the things you should know to safely obtain gas service and use it safely once it has been established in your structure.

Call before you dig!

Be sure to call to have all underground utilities located any time you plan to dig on your property.

Call Diggers Hotline at 1-800-242-8511 to have all underground utilities on your property identified at least three working days before you dig.

NOTE: This is required even if you think you know there are no other utilities where you intend to dig.

What to do if you suspect a natural gas leak

The odorant added to the gas will enable you to detect a small gas leak; however, using your nose is not the only way to detect a leak. Bubbles blowing in a puddle or a hissing sound also may indicate a natural gas leak. If you suspect a natural gas leak, follow these steps to ensure your safety and the safety of those around you:

- Leave the building immediately and leave the door open on the way out.
 - ✓ Do not use a telephone inside the affected building or do anything that might cause a spark.
 - ✓ Do not light a match.
 - ✓ Do not turn on a light switch.
 - ✓ Do not attempt to put out flames if a gas leak ignites.
- Use a neighbor's phone or find a pay phone and call MGE at (608) 252-1111. *(If you must use your cellular phone, be sure you are well away from the building.)*
- For emergencies, call 9-1-1.

When and how to shut off gas service

When an emergency strikes, it is not always necessary to shut off your natural gas service. Knowing when and how to shut off natural gas service can save you from being without gas service needlessly.

When to shut off your gas service

It is necessary to shut off your gas service at the service shutoff valve at the meter only when you hear or smell natural gas leaking.

How to shut off your gas service in an emergency situation

If there is an emergency situation and you need to shut off gas service at your meter, follow these three steps:

Step	Action
1.	Locate the service shutoff valve (usually the first fitting) on the natural gas supply pipe coming out of the ground near the meter.
2.	Use a long-handled wrench to turn the valve one-quarter turn so the lever is crosswise to the pipe.
3.	Once the gas is off, leave it off. Call MGE to inspect the system, check, and relight appliances.

In a nonemergency situation

If you need gas service to be shut off for a temporary, nonemergency situation, shut off service at the fuel-line valve located near the particular appliance .

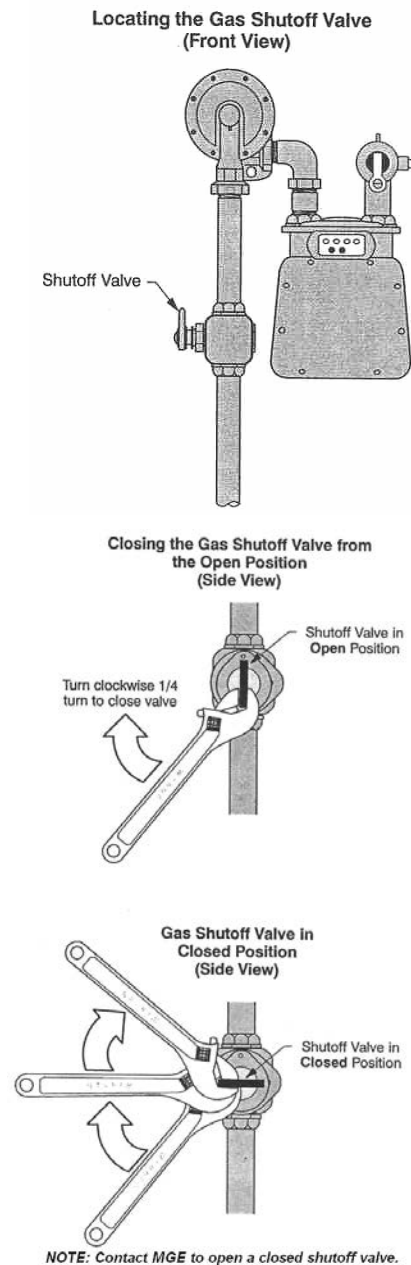


Figure 11. Gas service shutoff valve

What is carbon monoxide?

Carbon monoxide (CO) is an odorless, tasteless, and invisible gas which can build up when any fuel-burning equipment—an automobile, fireplace, natural gas or oil furnace, wood stove, propane heater, charcoal grill, or kerosene heater has insufficient air to burn the fuel completely. Carbon monoxide exposure can be dangerous.

Safety precautions

Here are suggestions to guard against carbon monoxide exposure in any structure:

- Use only fuel-burning equipment inside the structure that is designed to operate indoors. Vented gas equipment must vent to the outside according to the manufacturer's specifications.
- Make sure fuel-burning equipment is maintained and operated safely and properly.
- Never run an automobile engine, lawn mower, portable generator, or any combustion engine in an enclosed space.
- Keep flues and chimneys free of debris and clear of soot buildup.
- Consider the installation of a carbon monoxide detector, particularly near sleeping areas in a structure.

Know the early symptoms of carbon monoxide poisoning

If you think someone is suffering from carbon monoxide poisoning, move the person outside to fresh air immediately and seek medical help.

Early symptoms include:

- Dizziness
- Flu-like symptoms
- Weakness
- Nausea and vomiting
- Partial loss of muscular control
- Drowsiness
- Consider calling 9-1-1 if you have these symptoms

APPENDIX C

PROTECTION OF GAS SYSTEM FROM BACK PRESSURE OR VACUUM

A device shall be installed to protect MGE's equipment/system should our customer's equipment create a vacuum or back pressure (192.355)(a).

Natural gas compressors connected to MGE's system shall be connected through a check valve capable of withstanding the outlet pressure of the compressor.

Interconnection for Standby Fuels

Where a supplementary gas for standby use is connected downstream from a meter or a service regulator where a meter is not provided, equipment to prevent backflow shall be installed (NFPA 5.3.2.1).

A three-way valve installed to admit the standby supply and at the same time shut off the regular supply of natural gas shall be permitted to be used for this purpose (NFPA 5.3.2.2).

GLOSSARY

Appliance shutoff valve - A valve readily accessible and operable by the customer, located on the fuel line at or very near the appliance.

- **Open position** - Valve handle is parallel with the line.
- **Closed position** - Valve is crosswise or at a right angle to the fuel line.

Backfill - Earth or other material used to refill a trench. Also the act of refilling a trench.

British thermal unit (Btu) - Quantity of heat necessary to raise one pound of water one degree Fahrenheit at sea level pressure. The heating quality of the gas. *(One cubic foot of natural gas contains about 1,000 Btu.)*

Carbon dioxide (CO₂) - A gas which is a product of combustion, resulting when carbon unites with sufficient oxygen to produce complete combustion. When natural gas burns completely, it produces carbon dioxide and water vapor as well as heat.

Carbon monoxide (CO) - A poisonous combustible gas produced by the incomplete combustion of carbon or reduction of carbon dioxide.

Combustion - The process of burning requiring three components: fuel, air, and ignition temperature.

- Complete combustion of natural gas results in carbon dioxide and water vapor; harmless.
- Incomplete combustion of natural gas can produce carbon monoxide and aldehydes; potentially hazardous.

DOT (Department of Transportation) - U.S. Department of Transportation Office of Pipeline Safety initiates and enforces regulations relating to gas pipeline safety nationwide. Wisconsin State Department of Transportation initiates and enforces regulations relating to the use of public rights-of-way in the state.

Dry Utility - Power, phone, cable, or natural gas.

Easement - A legal document entitling its holder the right to use a specified parcel of property. Easements give MGE the right to install underground natural gas facilities on private property.

Emergency - A situation in which there is an immediate threat to life or property. In the case of natural gas, an emergency is an immediate threat and/or the uncontrolled escape of gas.

Fuel line - Gas piping from the meter to the appliance that is owned and maintained by the customer.

Ignition temperature of natural gas - Natural gas ignites at about 1,100 degrees Fahrenheit.

Ignitor - Any device used to light gas. A spark ignitor uses an electric spark generated across an air gap for this purpose.

Joint utility trench - Two or more utilities occupying a common trench.

Load (Gas) - The connected load is calculated by totaling the Btu rating for all gas appliances connected to the meter.

Main (Gas) - The distribution line (or pipe) that serves as a common source of supply for more than one service line. Owned and maintained by MGE.

Manifold - Usually two or more natural gas meters on one service line and regulator.

Mercaptan - An organic chemical odorant added to natural gas to give it a distinctive smell to alert customers in case of leaks. Natural gas is odorless in its natural state. Mercaptan smells something like rotten eggs.

Meter - A device for measuring and recording the volume of gas used.

Meter set assembly shutoff valve - A positive shutoff valve on all metering and/or service regulating facilities. The valve is located immediately upstream (on the service line side) of the meter set assembly.

- Open position - Valve handle is parallel with the line (gas is flowing through the meter).
- Closed position - Valve is crosswise or at a right angle to the fuel line (gas is not flowing through the meter).

Methane gas (CH₄) - A hydrocarbon gas that is the main component of natural gas (about 96 percent). It is colorless, odorless, and flammable and the same substance produced in some swamps, sewers, and landfills.

Multiple meter - Two or more meter sets branching off separate risers.

Natural gas - A naturally occurring mixture of flammable hydrocarbon and nonhydrocarbon gases found in porous geologic formations beneath the earth's surface often in association with petroleum. It's supplied as a fuel for millions of applications worldwide. The chemical composition is approximately 96 percent methane, 2 percent ethane, and 2 percent inert gases.

Propane gas (C₃H₈) - A colorless flammable gas found in petroleum and natural gas. It is odorized to make it easy to detect (smells sort of like garlic), heavier than air (specific gravity of 1.5), and has a Btu of 2,544 per cubic foot, whereas natural gas contains about 1,000 Btu per cubic foot.

Rate - Method of charging for energy usage. In the case of natural gas, for therms used.

Regulator (also Pressure regulator) - A device to lower the gas pressure. District regulators lower the pressure in mains. Meter regulators lower pressure at the meter, and appliance regulators lower pressure at the appliance.

Right-of-way - A collection of easements and/or permits allowing the holder to specific limited use of a parcel(s) of property (such as running a gas main through private properties or a dedicated area for use by the public for travel and utilities). This term refers to the land itself, not the right of passage over it. (*See also Easement.*)

Riser - The portion of the service that terminates aboveground at the structure to support the meter.

Riser valve - See meter set assembly shutoff valve.

Service - The pipe which carries gas from the main to the customer's meter.

Service shutoff valve - A convenient shutoff located outside of the customer's building. If the meter is located outside of the building, the meter set assembly shutoff valve may also be the service shutoff valve. In some commercial service applications this buried valve may be located in the right-of-way at the customer's property line.

Stub - The portion of the gas service from the main to the property line.

Therm - A therm of gas contains 100,000 Btu of energy and is roughly equivalent to 100 cubic feet of gas.

Trench - An excavated ditch of specific depth and width into which underground utility lines are installed.

