

# City of Elizabethtown



## Natural Gas Department

Plans and Specifications for  
Gas Service Piping Installations

(270)765-6121

## Table of Contents

<u>Third-Party Damage Prevention</u>	p.3
<u>Introduction</u>	p.4
<u>General Coverage</u>	p.5
<u>Service Lines</u>	p.5
<u>Ownership and Responsibility</u>	p.5
<u>Material and Installation-Steel Piping</u>	p.6
<u>Material and Installation-polyethylene (PE) Piping</u>	p.8
<u>General Requirements Governing Service Line</u>	p.10
<u>Meters and Service Pressure Regulators</u>	p.11
A. <u>General</u>	p.11
B. <u>Location</u>	p.11
C. <u>Installation</u>	p.12
D. <u>Equipment Connections to Building Piping</u>	p.15
E. <u>Concealed Piping and Buildings</u>	p.16
<u>Combustion Dilution and Ventilation Air</u>	p.16
<u>Electrical</u>	p.18
<u>Equipment Installation</u>	p.19
<u>Equipment Venting</u>	p.20
<u>Appliances Requiring Venting</u>	p.20
<u>Proper Venting for Gas Appliances</u>	p.21
<u>Venting into Masonry Chimneys</u>	p.24
<u>Through Outside Wall Venting</u>	p.24

Visual Indicator of Poor Performance p.24

Inspection and Testing p.26

Required Fees for Gas Service p.27

**Pipe Sizing Charts**

Schedule 40 Metallic Pipe p.28

Corrugated Stainless Steel Tubing p.29

Polyethylene Plastic Pipe p.30

### **Third-Party Damage Prevention**

The City has in effect a damage prevention program, required under Federal Pipeline Safety Regulation Part 192.614. Those individuals and/or companies who have intent to excavate in the vicinity of the pipeline facilities in either Hardin or Meade counties in Kentucky are required to notify Kentucky 811 by calling 811 a minimum of two working days prior to beginning any excavation activities. Upon notification of planned excavations, personnel will be dispatched to locate and mark with temporary yellow flags and/or yellow paint system pipelines in the area of excavation.

**Failure to comply with these requirements will result in the billing and collection of costs incurred for repairs made due to third-party negligence. Failure to comply with these requirements may also result in a penalty and/or fine to the third-party.**

## **Introduction**

These requirements and specifications governing the installation, maintenance inspection and testing of gas service lines, house piping, appliance connections, appliances, meters and regulators on customer premises are published by the City of Elizabethtown Natural Gas Department for the instruction and guidance of those persons and firms doing gas fitting work within its jurisdictional area. These requirements and specifications have been adopted in the interest of safe and adequate service to the customer. The term “City” when hereinafter used shall mean the City of Elizabethtown Natural Gas Department, its property and personnel. The term “Customer” when hereinafter used shall mean any person who receives gas service from the City of Elizabethtown Natural Gas Department.

These requirements and specifications govern service to both newly constructed and existing structures where any alterations or changes to the gas piping or appurtenances are being made. It shall be the duty of the customer, owner or their representative to notify the City of any changes affecting gas piping including: meters, regulators, customer service lines, customer house piping on, in or about the premises whether these actions are occasioned by accident or design. Gas service shall not be reinstated to the premises until all requirements have been met and the lines have been tested, inspected and approved. When altering or extending house piping or service lines; all changes shall be made to conform to these requirements and specifications.

When conditions are not specifically covered in these requirements and specifications or other local codes, reference may be made to the current edition of the **NFPA #54 National Fuel Gas Code**.

**IT IS NOT INTENDED THAT THESE REQUIREMENTS AND SPECIFICATIONS BE ALL INCLUSIVE, AND WHERE UNUSUAL CONDITIONS ARISE OR WHERE SPECIAL SERVICE IS REQUIRED, THE CITY IS TO BE CONSULTED BEFORE PROCEEDING WITH THE WORK.**

The City shall inspect each service for compliance with these specifications and refuse gas service to any premises where the gas piping does not conform to these requirements and specifications. The Customer shall assume responsibility for any defective material or faulty workmanship in the installation of the customer service line, house piping, appliances or appliance connections. The Customer shall also assume responsibility for any loss or damage which arises as a result of such defective material or faulty workmanship on any job of gas fitting. If any questions arise on any type of gas related problem, call the City at (270) 765-6121, Ext 229, Monday through Friday 7:30 A.M to 4:30 P.M.

## General Coverage

Coverage of piping systems includes design, design material, components, fabrication, assembly, installation, testing and inspection.

Coverage of gas utilization equipment and related accessories includes installation, combustion, dilution, ventilation air, venting, acceptability of equipment and inspections.

## Service Lines

The general term “service line” is commonly used to designate the complete line or connection between the main and the meter setting on the customer’s premises. Since these lines are constructed in two parts and by different parties, it is important to designate each part. The City’s “service line” is from the main up to and including the curb valve, adjacent to or at the property line. The “customer service line” (yard-line) consist of all piping downstream of the curb valve and includes all piping necessary to extend to the meter setting. The meter setting consists of the shut-off valve, regulator, meter and all piping to the outlet side of meter. The “house-line” consists of all piping downstream of the meter outlet and includes all interior and exterior low-pressure piping.

## Ownership and Responsibility

1. The City’s service line consists of the connection at the main, all necessary pipe to extend to the property line or curb valve location, the curb valve and the curb valve box. This connection is made by the City or its representative and remains the property and responsibility of the City.
2. The materials, installation and location of the customer service line and house-line shall be subject to requirements and specifications contained herein. Such line shall be subject to inspection and may be required to be tested at any time as provided herein, but **the customer service line shall be the responsibility of the customer.**

## Materials and Installation – Steel Piping

1. The Minimum size of the service line connection by the City shall be one inch, and the next larger size shall be two-inch. The size installed shall permit the delivery of the estimated maximum hourly rate with ½” water column pressure drop or less between the main and the meter location. The customer service line should not be of a size smaller than that of the City’s service line connection.
2. Cathodically protected schedule 40 or heavier coated steel pipe with welded and wrapped joints shall be used for all steel service line sizes 1” through 2”. For larger sizes, consult the Gas Department for specifications. **Galvanized and/or copper pipe is not permitted as a service line.**
3. Where more than one length of pipe is required, welding shall be used.
4. A compression coupling of the Dresser type (style 90) at least 6” in length, or its equivalent with armored gaskets, shall be used to connect the customer service line to the service line valve connection.
5. The location of the point of delivery shall be acceptable to the City.
6. The customer, owner or their representative shall contact the Gas Department at 270-765-6121 for information as to size, location and termination points of the service line.
7. The customer service line shall be laid on undisturbed or well-compacted soil in a separate trench avoiding sewers, waterlines and conduits. Gas piping shall not run through septic tanks or leaching beads. If the customer service line is to be laid in the same trench as water or sewer service lines or conduits, a minimum horizontal distance of twelve inches must be maintained between these lines. Gas lines shall not be laid on a bench or offset of a deeper trench. The trench shall be graded uniformly to provide a solid and continuous foundation for the pipe and shall be deep enough to provide a minimum of 18” of cover over the service line.
8. The customer house line should enter the foundation above grade. If it is necessary that the house line enter below grade, the City must be consulted.
9. Where turns are required, offsets consisting of bends or welded ells not to exceed 92 degrees will be permitted as long as the piping is not distorted or kinked. Damaged coating must be repaired.

10. The customer service line should not be laid under concrete or other hard surface walks or driveways except where it may be necessary to cross under such walks or driveways which extend from the curb to the foundation wall and the full width of the property (ex. Service stations and places of business). Where a customer service line is installed under these conditions, casing and venting shall be installed at the customer's expense. Casing and venting shall not be necessary if the curb valve is not located under the hard surface and the hard surface is cut away (12) twelve inches in all directions from the riser. The area around the service riser shall be filled with a non-compacting material.
11. Each length of pipe shall be examined before connecting and any dirt or obstruction removed.
12. Customer service lines shall terminate at an outside meter setting and incorporate a regulator.
13. The customer service line shall not be backfilled until after the line has been inspected and approved by the City's representative. A minimum 90-psig-air pressure test required for at least 15 minutes.
14. No heavy weight material such as stones, concrete block, brick or building debris shall be placed in the service line ditch or in the backfill over the service line. No heavy equipment shall be run over the service line ditch after it has been backfilled.
15. **Any gas piping in contact with soil or other material that could corrode the piping shall be protected against corrosion in an approved manner. Piping shall not be installed in contact with cinders. Threaded or socket welded joints shall not be used on piping in contact with soil or where internal or external crevice corrosion is known to occur. Piping used in this type of installation shall be either welded, coated, cathodically protected steel or a non-corroding material such as polyethylene (PE) piping.**



## Materials and Installation –Polyethylene (PE) Piping

This section is intended to provide understandable guidelines for the installation of polyethylene (PE) plastic gas lines. All other guidelines as set out in this code shall also apply.

Plastic pipe and fittings shall be used outside and underground only and shall conform to **STANDARD SPECIFICATIONS FOR TERMOPLASTIC GAS PRESSURE PIPE TUBING AND FITTINGS, ASTM-D2513**. Pipe to be used shall be marked “GAS” and ASTM-D2513. It shall have a wall thickness of at least .099”. All transition fittings and service risers shall conform to federal and manufacturers’ specifications for use with polyethylene (PE) pipe.

1. Any person installing plastic (PE) pipe is required by this code to be certified for such installations. Upon inquiry by the City’s Representative, proof of certification must be provided.
2. All materials shall be inspected by the City’s representative to ensure that all materials meet specifications.
3. **Piping shall be handled with care.** Gouges, grooves and notches in pipe can cause pipe failure. Defects of this nature shall be prevented and or eliminated. Excessive pipe bends, edged pipe or damaged pipe of any kind shall not be used.
4. Plastic pipe trenches shall not be backfilled until inspected and accepted by the City’s Representative.
5. When joining pipe by fusion methods, the pipe can be lowered into the trench only when all fusion joints have properly cooled according to accepted procedures.
6. Pipe shall be snaked in the trench to provide a means of expansion and contraction. Avoid pulling the pipe “taut” at all times.
7. Plastic pipe shall have a minimum cover of twenty-four (24) inches to accommodate tracer wire and warning tape.
8. Plastic pipe is a non-conductive material and does not readily reflect conventional locating signals. To insure locating ability, a “tracer wire” shall be installed in the trench.
9. Tracer wire shall be a minimum #10 AWG stranded, insulated wire. The wire shall be inspected prior to backfilling. The wire should be installed within four inches of the piping but should not touch the gas pipe.
10. #10 AWG insulated stranded wire shall be bonded directly to the City supplied tracer wire and attached to a non-metallic riser or house siding at the meter set to facilitate ease of locating and prevent accidental damage from future excavations. Electrical continuity

must be maintained. Connection must be made using a split bolt connector. The connection must be wrapped in rubber tape and wrapped a second time in electrical tape.

11. Warning tape shall be installed approximately nine (9) inches below final grade to act as a warning for those doing future excavations. The tape shall read **“CAUTION BURIED GAS LINE”**.
12. All backfill material shall be free of rock, gravel, building debris and other materials that could damage the pipe. Bedding the pipe in sand does not negate this requirement.
13. When piping must be laid in rocky ground, through gravel, soil containing gravel or material which may damage the pipe, the line shall be protected by encasement in schedule 40 or heavier PVC pipe. The casing shall be a minimum of 2 full inch sizes larger than the plastic gas line. Casing should terminate approximately 5 feet from curb valve and meter riser to allow for snaking of the plastic gas pipe allowing expansion and contraction. The snaked piping outside of the casing may be bedded in sand. See #15.
14. Where compression-type mechanical joints are used, an internal, tubular, rigid stiffener shall be used in conjunction with the fitting. The stiffener shall be flush with the end of the pipe or tubing and shall extend at least to the outside end of the compression fitting when installed. The stiffener shall be free of rough or sharp edges and shall not be a force fit into the plastic. Split tubular stiffeners shall not be used.
15. As an alternate method of protection, the line may be bedded in sand. The sand shall extend six inches below and six inches above the gas pipe.
16. All sections of plastic (PE) pipe are required by this code to be pressure tested to minimum of (90) ninety psig for at least 15 minutes and accepted by the City’s Representative prior to being connected to the City’s service valve (curb valve).
17. Risers for plastic pipe shall be permanently mounted to the structure wall by means of two split ring connectors or their equivalent. One connector must be located approximately 2 inches below the service head adapter. The other may be located above the regulator. The service head adapter shall be located approximately 6 inches above finish grade.

18. When installing plastic piping from a high-pressure reduction loop, a support post must be installed. The riser shall be permanently affixed to the post in the same manner as to a structure wall.
19. Plastic pipe may in some cases be used to replace outdoor underground piping by the insertion method. The City must be consulted before using this method.
20. Risers may be of an approved pre-fabricated type or may be field constructed by use of schedule 40 black steel pipe and an approved service head adapter. The schedule 40 black steel casing must extend a minimum of one (1) foot below and 6" above finished grade. A grommet must be installed to protect entry of the plastic pipe into the steel riser casing.
21. An approved steel to plastic transition fitting must be used to connect the plastic service line directly to the City's curb valve. A service head adapter cannot be used for this purpose.

### **General Requirements Governing Service Lines**

1. Each building served with gas shall have a separate customer service line. A separate service line may not necessarily be laid for gas service to a garage, workshop or other building on a lot where a service line to the residence or main building of the customer already exists.
2. Curb valves and curb boxes should be located at the property line. Curb valve boxes must be installed so as to be protected from possible damage by outside forces. The installer shall install the curb box directly above the curb valve to guarantee proper valve access. The general contractor may be charged for any damages to the curb box.
3. For duplexes or apartment buildings, multiple meters may be installed in a manifold if approved by the City. The City must be consulted before any manifolds are built. A multiple meter fee is required for any manifold installation.
4. Meters at multiple meter installations shall be plainly marked by permanent means attached by the installer designating which building or part of the building each meter supplies.
5. Each meter shall have a separate meter stop and regulator.
6. Where meters are manifold at one location, a valve controlling the gas supply to all meters must be provided in addition to the stops controlling the supply to each meter.

## Meters and Service Pressure Regulators

### A. General

1. The City will furnish a meter, meter valve and regulator for each customer. These appurtenances shall remain the property of the City. The installation of the meter loop and the meter is the responsibility of the customer. The installation may be done by a plumber, contractor, or an individual in a manner acceptable to the City. All screwed fittings are to be black, malleable iron. Bushings, unions, thread protectors, all-thread nipples, cast iron fittings, street fittings, galvanized or copper fittings and solder type fittings and connections **are not** permitted in the customer service line with the exception of above ground insulated unions installed for cathodic protection purposes. All fittings must have tapered threads. Running threads are not to be used.
2. **Where necessary to make piping alterations, a contractor or plumber shall first call the City to close the meter valve. The meter valve shall be shut off and locked. The City shall be notified to turn the gas back on.**

### B. Location

1. The City reserves the right to determine meter location and capacity.
2. Gas meters shall be installed as near as practical to the point where the house line enters the building and shall be placed as to be readily accessible for examination, reading and replacement.
3. The gas meter shall not be installed in a small, unvented or confined space.
4. A gas meter shall not be placed where it will be subject to physical damage such as in driveways, public passages, etc., or where it will be subjected to excessive corrosion. The customer must provide protection in the event the meter set location is in an area where damage could occur.
5. Gas Meters shall be located a minimum horizontal distance of three (3) feet from any electrical panel, electric meter, equipment disconnect or switch, electrical outlet and other equipment capable of producing a spark. Meter sets should be located at least three (3) feet horizontally from windows unless the windows are of the sealed or non-opening type.
6. Gas meters shall be securely supported so as not to exert a strain on the meter.
7. Pressure regulators and meters supplied from intermediate and high pressure mains shall be installed outside of the building.
8. Plantings or landscaping shall not hinder meter set maintenance or cause damage to or hindrance of access to the meter set.

### **C. Installation**

1. An approved tamper-proof, locking type valve (a valve designed and constructed to minimize the possibility of the removal of the core of the valve accidentally or willfully) shall be installed in the piping between the service line and the meter inlet.
2. The distance between the meter set and any wall should not be less than eight (8) inches. The bottom of the meter and service head adapter shall be a minimum of six (6) inches above finished grade.
3. Meter settings must be plumb and level so the meter will line up properly with the meter connections. Large meter installations, AL 800 and larger, shall have a by-pass installed for on-site testing by a City representative.
4. When passing through a masonry wall, piping shall be protected by encasing it in a protective (PVC) sleeve. Sleeves should be sealed by means of a non-corrosive agent that allows minor movement of piping.
5. Large meter sets, AL 800 and larger, that do not have by-pass piping and are shut off for any reason shall have by-pass piping installed before service will be restored.
6. The City is not responsible for providing required fittings (other than those provide with paid meter fees).

### **D. Rural Service from High Pressure Lines**

When the City has no intermediate pressure mains or lines available and service is desired from a high pressure distribution line, the City will provide suitable regulator/regulators for reducing the pressure from the high pressure distribution line to intermediate pressure at the outlet of the regulator setting. The regulator/regulators shall be installed at the customer's expense in accordance with plans furnished by the City and immediately adjacent to the City's high-pressure line. The customer shall provide at his own expense suitable and substantial protection from disturbance by irresponsible parties to regulator/regulators and the meter furnished by the City.

### **E. Cathodic Protection Requirements**

Cathodic protection (corrosion control) shall be provided by the customer, at the customer's expense, for all coated steel underground piping by an acceptable method or combination of methods available. **Consult the City on this matter.**

## **Piping Downstream of Meter**

### **A. Materials**

1. Gas piping in buildings shall be schedule 40 steel or annular stainless steel complying with ASME guidelines for continuous, flexible, annular stainless steel gas piping systems installed according to manufacturers' specifications.
2. All fittings shall be malleable iron (except valves, and unions).
3. Running threads, right and left couplings, bushings, cast iron fittings, solder type fittings and connections, thread protectors and street fittings shall not be used.
4. When unions are used, they shall be of the ground joint type with the exception of insulated unions used for cathodic protection
5. Only hard seat valves shall be used, and all valves requiring packing shall be packed.
6. A.G.A. listed flexible metal connectors shall be used in connecting gas appliances when flex connectors are used.
7. When elevated pressure (one pound or more) is desired, permission must be obtained from a gas department representative. If permission is granted, the maximum design operating pressure for piping systems located inside commercial buildings shall not exceed 5 psig. Unless the piping is welded.

### **B. Installation**

1. All gas piping or appliance installations shall be performed with the gas turned off to eliminate hazards from possible gas leakage.
2. The customer, at their expense, shall install the piping from the meter outlet to all gas burning appliances.
3. Gas piping and fittings shall be free from cutting burrs and defects in structure or threading. Thread lubricant, acceptable for natural gas service, is to be used sparingly on male threads only.
4. All pipes shall be securely supported by means of straps or fastenings of permanent material to ceilings and walls, eliminating all strain on piping. Gas piping shall not be used to support other piping or structures.

**PIPE SIZE**

**SUPPORT SPACING**

½”

6’

¾” to 1”

8’

1 ¼” or larger (horizontal)

10’

1 ¼” or larger (vertical)

each floor level

5. Gas piping inside any building shall to be run in or through a circulating air duct, clothes chute, and chimney, ventilating duct, dumb waiter or elevator shaft. Gas piping cannot be installed in solid walls or partitions. Gas piping may be installed through combustion air openings or ducts and accessible above ceiling spaces even if such spaces could possibly be used as a plenum. Gas piping may be installed in hollow walls or partitions.
6. Gas piping shall not be laid in or under a concrete floor or slab unless properly encased and vented.
7. When a flexible metal connector is used it shall connect to a solid pipe outlet in the same room as the appliance it serves. The length of the connection shall be as short as practical. It shall be installed so as to be protected against possible physical and or thermal damage. Connection of the flex line shall be made downstream of the appliance stop. Solid pipe must be run to a point 1 inch past the threads outside of the appliance cabinet before the flex connector is installed. The flex connector shall not be smaller in size than the automatic valve opening to which it is connected.
8. The unthreaded portion of the gas piping shall extend no less than one (1) inch through finished ceilings or indoor/outdoor walls. All unused outlets are to be securely capped or plugged.
9. The unthreaded portion of gas piping shall extend a minimum of two (2) inches above the surface of finished floors.
10. A readily accessible shut-off valve shall be installed ahead of each gas-burning appliance. The shut-off valve shall be installed in the same room and within six (6) feet of the appliance it serves. It shall be installed upstream of the sediment trap and flex line connection.
11. Any gas burning appliance not factory equipped with a sediment trap shall have one installed. Sediment traps must be a minimum of four (4) inches in length and be installed downstream of the appliance stop.
12. Piping and fittings shall be sized according to the NFPA 54.National Fuel Gas Code. The pipe size of each section of gas piping shall be determined using the longest length of piping from the point of delivery to the most remote outlet and the load of the section. Drop line to gas burning appliances shall not be smaller in size than the connection at the appliance automatic gas valve.

13. Connections shall not be made between the gas line and any other line carrying a fluid or gas other than that in the mains. A regulator which has gas on one side of the diaphragm and water, air or steam at more than atmospheric pressure on the other side of the diaphragm shall not be installed.
14. Gas piping may be installed in accessible spaces between a fixed ceiling and a drop ceiling whether or not such spaces are used as a plenum
15. Gas piping outlets shall not be located behind doors.
16. When remodeling or extending existing piping, it shall be checked to determine if it has adequate capacity. Where capacity cannot be maintained from existing piping, a separate line from the meter may supply appliances or the existing piping may be resized and upgraded.
17. An accessible shut off valve shall be provided upstream of each pressure regulator. Where two gas pressure regulators are installed in series in a single gas line, a manual valve shall not be required at the second regulator.

### **C. Roof Equipment**

1. At least (6) feet of clearance shall be maintained between any part of the equipment and the edge of a roof or similar elevated location. Where clearance cannot be maintained, hand railings at least 42 inches in height shall be provided on the exposed side/sides.
2. Gas utilization equipment located on roofs or other elevated locations shall be accessible by means of a permanently mounted, protected, exterior ladder or stairs (Commercial applications).
3. Buildings of more than fifteen feet in height shall have an inside means of access to the roof.

### **D. Equipment Connections to Building Piping**

1. Listed gas appliance connectors (Flex lines) must be installed in the same room as the equipment they serve. The connector shall be installed so as to be protected against possible physical or thermal damage (they cannot be installed inside a furnace cabinet). The connector shall be of minimum practical length, not to exceed six (6) feet (for a kitchen range only). The connector shall not be concealed and shall not extend from one room to another or pass through wall partitions, ceilings or floors. Connectors cannot be joined together to create a longer connector. **Continuous, flexible, annular stainless steel systems are not classified as flex lines.**



2. All gas utilization equipment using electrical controls shall have the controls connected into a permanently live electrical circuit before a final inspection by the representative can be made.

#### **E. Concealed Piping in Buildings**

1. Where gas piping is to be concealed; unions, tubing fittings, right and left couplings, bushings, swing joints, and compression couplings made by combinations of fittings shall not be used.

Exception #1 – Joining piping by welding shall be permitted

Exception #2 – Fittings listed for use in concealed spaces that have been demonstrated to sustain, without leakage, any forces due to temperature expansion or contraction, vibration, or fatigue based on their geographic location, application or operation shall be permitted to be used.

Exception #3 – where it becomes necessary to insert fittings in gas piping that has been installed in a concealed location, the pipe shall be permitted to be reconnected by welding or flanges. If annular stainless steel must be repaired due to fire or other hazards, recommended manufacturers' procedures shall be followed.

#### **Combustion Dilution and Ventilation Air**

1. When normal infiltration does not provide the necessary air for combustion, dilution and ventilation, outside air must be introduced. Additional air must be introduced if the volume of the space containing the gas utilization equipment does not equal fifty cubic feet of free air per one thousand BTUs of combined input rating of all gas utilization equipment located in the space. This does not pertain to category 4 equipment (direct vent) if intake as well as vent piping is properly installed. Both intake and exhaust piping must be installed in order to be classified as direct vent equipment.
2. When equipment is located in a confined space (Reference 1 above) and air for combustion, ventilation, and dilution is taken from inside the building, there must be two permanent openings provided. Each opening shall have a minimum free area of one square inch per one thousand BTUs of combined input rating of all gas utilization equipment located in the space but not less than one hundred square inches. One opening shall be located with twelve inches of the top and one opening shall be located within twelve inches of the bottom of the enclosure. These openings must be installed into as many walls or doors as needed to make the space meet volumetric specifications for an unconfined space. Combustion air cannot be taken from bedrooms or bathrooms.
3. If air for combustion, dilution and ventilation is taken directly from the outdoors, each opening shall have a minimum free area of one square inch per for thousand BTUs of combined input ratings of all gas utilization equipment located in the space.

4. In communicating with the outdoors through horizontal ducts, each opening shall have a minimum free area of one square inch per two thousand BTUs of the total combined input rating of all equipment located in the space. When ducts are used, they shall be of the same crossed sectional area as the free opening to which they connect. Air duct dimensions shall not be less than three inches.
5. One permanent opening commencing within twelve inches of the top of the enclosure shall be permitted if the equipment has clearances of at least one inch from the sides and back and six inches from the front of the appliance. The opening shall communicate directly with the outdoors or shall communicate through a vertical or horizontal duct to the outdoors or spaces that communicate freely with the outdoors. They shall have a minimum free area of one square inch per three thousand BTUs of total input rating on all gas equipment located in the space but not less than the sum of the areas of all vent connectors in the confined space.
6. Combination of air from the indoors and from the outdoors. Where the building in which the gas burning appliances are located is not of unusually tight construction and the communicating interior spaces containing the gas burning appliances comply with all requirements except the volumetric requirement, combustion, dilution and ventilation air may be obtained by opening the room to the outdoors utilizing a combination of indoor and outdoor air prorated in accordance with the National Fuel Gas Code.
  - (A) Combine the input ratings of all gas appliances located in the space.
  - (B) Perform calculations to determine the total number of BTUs the inside air volume will support ( $\text{Length} \times \text{Width} \times \text{Height}$  divided by fifty). Air for combustion, ventilation, and dilution cannot be taken from bedrooms or bathrooms.
  - (C) Cut two openings into available inside air space. They shall be large enough to contain one square inch of free area per one thousand BTUs but not less than one hundred square inches. One opening shall be located within one foot of the ceiling and one opening within one foot of the floor of the confined space.
  - (D) Reduce the total combined BTUs rating by the number of BTUs the inside air space will support.
  - (E) Cut two openings to the outside air space sized to the pro-rated BTU input. The openings shall have 1 square inch of free area per 4000 pro-rated BTUs. One opening shall be located within one foot of the ceiling and one within one foot of the floor of the confined space. The openings shall communicate directly with the outdoors. Openings shall have no dimension smaller than 3 inches.
  - (F) Cut one opening to the outside air space sized to the pro-rated BTU input. The openings shall have 1 square inch of free area per 3000 pro-rated BTUs. The opening shall be located within one foot of the ceiling and communicate directly with the outdoors. Openings shall have no opening smaller than 3 inches.

7. These requirements shall not necessarily govern when an engineered design approved by the City provides an adequate supply of air for combustion, ventilation and dilution of flue gases.
8. In calculating free area, consideration shall be given to the blocking effect of louvers, grills or screens protecting openings. Screens shall not be smaller than ¼” mesh. Wood louvers shall have 20% - 25% free area and metal louvers and grills shall have 60% - 75% free area. They shall be fixed in the open position or interlocked so that they open automatically during equipment operations.

**It cannot be overemphasized that an adequate supply of fresh air is needed by the appliance and vent system. Check to be sure that all provisions for supplying air are proper. Any air duct/ducts must be at least as large as the free opening of louvers that pass the air. Screens with small openings shall not be used in the air duct/ducts because they can become blocked easily by airborne dirt and lint. Screens with less than ¼” openings shall not be used. There shall be no provisions for closure.**

### **Electrical**

1. 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 when it is connected to appliances that are connected to the appliance grounding conductor of the circuit supplying that appliance.
2. Gas piping shall not be used as a grounding conductor or electrode.
3. A permanent 120 VAC receptacle outlet and lighting fixture shall be installed near any attic installed appliance. A switch controlling the lighting shall be located at the entrance to the attic passageway.
4. All gas utilization equipment using electrical controls shall have the controls connected into a permanently live electrical circuit, that is, one that is not controlled by a light switch.
5. Central heating equipment shall be provided with a separate electrical circuit.

## Equipment Installation

1. Gas utilization equipment shall not be installed so its combustion and ventilation air is obtained from a bedroom or bathroom. Direct make-up air heaters shall not be used to supply any area containing sleeping quarters.

Exception 1 – Where approved by the City, one listed unvented room heater equipped with an oxygen depletion safety shutoff system shall be permitted to be installed in a bathroom provided that the input rating does not exceed 6000 btu/hr and combustion, ventilation and dilution air is adequate.

Exception 2 – Where approved by the City, one listed unvented room heater equipped with an oxygen depletion safety shutoff system shall be permitted to be installed in a bedroom provided that the input rating does not exceed 10,000 btu/hr and combustion, ventilation and dilution air is adequate.

2. Decorative appliances (gas logs) may be installed in vented fireplaces constructed of noncombustible material. They shall have an automatic shut-off device but shall not be thermostatically controlled. **Log lighters used to ignite solid fuels shall not be used.**
3. A fireplace screen shall be installed with a decorative appliance in a vented fireplace.
4. When a furnace is installed to carry circulated air through supply ducts to areas outside the space containing the furnace, the return air shall also be handled by a duct/ducts sealed to the furnace casing and terminating outside the space containing the furnace.
5. Gas appliances, installed in beauty shops, barber shops or other facilities where chemicals which generate corrosive or flammable products, such as aerosol sprays, are routinely used, shall be located in an equipment room separate or partitioned off from these areas with provisions for combustion and dilution air from outdoors.
6. For installation of gas utilization equipment in an attic space, the passageway and servicing area adjacent to the equipment shall be floored. Passageways shall be a minimum of twenty-four (24) inches wide. Thirty (30) inches of clearance in front of the equipment shall be floored.
7. A permanent 120 VAC receptacle outlet and lighting fixture shall be installed near any attic installed appliance. A switch controlling the lighting fixture shall be located at the entrance to the attic passageway.
8. Gas utilization equipment in residential garages shall be installed so that all burners and ignition devices are located not less than eighteen (18) inches above the floor with the exception of devices certified by the manufacturer to be installed at a lower level.
9. Such equipment shall be located or protected so as not to be subjected to physical damage by a moving vehicle.

10. Vent less gas fireplaces or heaters may be installed if three conditions are met:

1. A vent less unit must be equipped with an O.D. S. sensor.
2. A Vent less unit cannot be used as a primary heat source.
3. A vent less unit must be supplied with adequate ventilation, dilution and combustion air

### **Equipment Venting**

The policies described in the following pages were established in order to follow safe practices to guard against the misuse of appliances and to provide for the greatest safety and economy in the operation of appliances.

The matter of ventilation also has a part in the formation of City guidelines. Each cubic foot of gas burned requires about fifty cubic feet of free air for combustion, ventilation and dilution of flue products. 1/100 pint of water vapor is also formed. Therefore, appliances operating in a room without reasonable ventilation could soon consume the oxygen in the air and saturate the air with moisture to the point that the occupants would feel discomfort. Poorly vented equipment could also contribute to the formation of carbon monoxide, a toxic by-product of incomplete combustion. A gas appliance vented into a flue operates as an exhaust system, which will cause fresh air to be drawn into the room

### **Appliances Requiring Venting**

**The following appliances** must be properly vented before the City representative will establish service:

1. Steam and hot boilers, water heaters, warm air furnaces, floor furnaces, ducted furnaces and recessed heaters.
2. Room heaters installed in sleeping quarters for use of transients as in hotels, motels and auto courts. Heaters used in institutions such as homes for the aged, sanitariums, convalescent homes and orphanages shall be of the sealed combustion type.
3. Automatic water heaters of any type which contain a thermostatic device for regulating the gas to the main burner.
4. Gas fired incinerators.

## Proper Venting for Gas Appliances

1. Appliances must be vented to a bon-a-fide chimney flue or vent constructed of lined masonry or Type B dual wall metal. Factory built triple-wall chimneys' certified for natural gas may also be used. (Metal Flues are only effective when they run in the interior of the building)
2. Vents must not open into attics, under porches or similar places.
3. Vents should be constructed or installed in such a way as not to become a fire hazard. Where flues or vent connectors (Type B only) pass through partitions of combustible construction, proper clearances must be maintained.
4. Gas appliance, except gas log sets, shall not be vented to a fireplace flue unless the fireplace and other openings in the flue are permanently sealed.
5. The vent connector shall maintain a continuous rise from the appliance to the flue or vent. A rise of  $\frac{1}{4}$ " per foot of horizontal length must be maintained.
6. The horizontal run of the connector should be as short as possible and the appliance located as near the flue or vent as practicable. The maximum length of the vent connector shall not exceed eighteen (180 inches per inch diameter).
7. A damper shall not be placed in any flue or vent connector.
8. The flue or vent connector of a water heater shall not be smaller than the size of the outlet of the draft hood supplied by the manufacturer of a gas-burning appliance.
9. Two or more category one appliances may be vented through a common flue or vent when necessary, provided the size of the common flue or vent is sufficient to accommodate the total volume of flue gases, but not oversized. Fittings where vent connectors join the common vent must be installed vertically so the smaller size vent connector enters the common vent above the larger size vent connector. Vent connectors shall not enter the common vent through the cross of a tee.
10. A draft hood shall be installed in the position for which it was designed with reference to the horizontal and vertical planes and shall be so located that the relief opening is not obstructed by any part of the appliance or adjacent construction.
11. A gas appliance shall not be vented into the same chimney, flue or vent with an appliance burning solid or liquid fuel unless certified by the manufacture for this use.
12. If any gas appliance has an automatic pilot, the operation of the pilot safety must be checked.

13. The City will upon request consult with owners, architects or contractors for special installation requirements. (These specifications shall not apply to the installation of appliances approved under A.G.A. requirements for equipment having a sealed combustion chamber and direct air supply for complete combustion from the outside and direct discharge of all products of combustion to the outside, in which the vent is an integral part of the equipment).
14. No portion of a venting system shall extend in or pass through any circulating air duct or plenum, with the exception of accessible above ceiling spaces, which may be used as a plenum.
15. A Category I vent extending through an exterior wall shall not terminate adjacent to a wall or below eaves or parapets.
16. Minimum clearance for single wall metal pipe to combustible material shall be six (6) inches.
17. Minimum clearance for dual wall (Type B) vents to combustible material shall be one (1) inch.
18. A vent system shall terminate at least three (3) feet above any forced air inlet located within ten (10) feet.
19. Single wall metal pipe shall not be used outdoors or in unconditioned space for venting gas utilization equipment.
20. The effective area of the vent connector on a water heater shall not be less than the area of the draft hood outlet.
21. When two or more appliances are vented through a common vent, the manifold shall be located at the highest level consistent with available headroom and clearance to combustible material.
22. When two or more vent connectors enter a common gas vent, the smaller BTU rated equipment connector shall enter at the highest level. All possible vertical rise should be maintained.
23. A vent connector shall be installed so as to avoid turns or other construction features which create excessive resistance to the flow of vent gasses.
24. A vent connector shall be supported to maintain clearances and prevent physical damage and separation of joints.
25. When the vent connector must be located in or pass through a crawl space, attic or any area where the temperature may be below that normally maintained for comfort, that portion of the vent connector shall be listed dual wall (Type B or Type L) vent material.
26. The entire length of a single wall vent connector shall be in plain sight and readily accessible for inspection.

27. A vent connector shall not pass through any ceiling, floor, firewall or fire partition. A single wall metal pipe connector shall not pass through any interior or exterior wall.
28. Connectors made of type b listed material may pass through outside walls with proper clearance to combustible materials.
29. Vent connectors for medium heat equipment (small boilers) shall not pass through walls or partitions constructed of combustible materials.
30. Vent connectors serving equipment vented by natural draft shall not be connected into any partition of a mechanical draft system operating under positive pressure.
31. Gas utilization equipment located on more than one level may be vented through a common vent provided the equipment is fully enclosed in a furnace or utility room and all air for combustion, ventilation and dilution is obtained from outside the building. The flue must be vertical, and no offsets of any kind are permitted.
32. Before connecting a vent connector to a chimney passageway, it shall be examined to ascertain that it is clear and free of obstructions and shall be cleaned if previously used for venting solid fuel burning appliances or fireplaces.



## Venting Into Masonry Chimneys

### A. Internal Masonry Chimneys

Venting of induced category 1 appliances into a lined, internal masonry chimney is allowed only if it is common vented with at least one natural draft appliance or with a manufacturer approved draft kit assembly or designed with type B double wall vent or suitable flexible liner material. Liner leaks will result in early deterioration of the chimney.

### B. External Masonry Chimneys

Venting of fan assisted appliances into external chimneys (i.e. one or more walls exposed to outdoor temperatures), requires the chimney to be lined with type B double wall vent or suitable chimney liner material. This applies in all combinations of common venting as well as for fan assisted appliances vented alone.

**Unlined chimneys are not approved for gas appliance venting.**

### Through Outside Wall Venting

- A. A venting system shall terminate at least 3 feet above any forced air inlet within 10 feet.
- B. The venting system of other than a direct vent appliance shall terminate at least 4 feet below, 4 feet horizontally from, or 1 foot above any door, window or gravity air inlet into any building. The bottom of the vent terminal shall be located at least 12 inches above normal snowfall.
- C. The vent terminal of a direct vent appliance with an input of 50,000 BTUs per hour or less shall be located at least 9 inches from any opening through which flue gasses could enter a building. An appliance with input over 50,000 BTUs per hour shall require a 12-inch vent termination clearance. The bottom of the vent terminal and the air intake shall be located at least 12 inches above normal snowfall.

### Visual Indicators of Poor Performance

Many times a visual inspection of the vent system will indicate the cause of a problem or a potential problem. If these indicators are recognized, a potentially dangerous situation may be avoided. Some of the more obvious indicators are listed below:

- Vent connectors smaller than the outlet of the draft hood on water heaters
- The use of more than two (2) 90-degree elbows in a vent connector.
- A vent connector attached to a second vent connector.
- Connection of two (2) appliances to a common vent through the cross of a tee at the bottom of the vertical common vent.

- A lateral or horizontal run of the vent connector in excess of 18” per inch diameter or in excess of 75% of the total flue height.
- Single wall metal pipe is not to be used outdoors in cold climates. Such use may cause condensation and corrosion of the vent system.

The vent for category 1 appliances shall not terminate adjacent to a wall or below eaves or parapets. Wind flow over roof structures often causes localized pressure disturbances. The vent termination must be placed where these effects are minimized.

**Capacity of Vent Piping**

Vent Size (in.)	Sq. In. Area
3	7.0”
4	12.2”
5	19.6”
6	28.3”
7	38.3”
8	50.3”
9	63.6”
10	78.5”

**Maximum Vent Connector Horizontal Length**

Diameter (in.)	Horizontal Length (ft.)
3	4 ½
4	6
5	7 ½
6	9
7	10 ½
8	12
9	13 ½
10	15

## **Inspection and Testing**

1. Inspection and testing are required on each installation of service piping, house piping and equipment installation.
2. Inspection and testing of new or revised service piping shall be made before the trench is backfilled or house-line piping is concealed.
3. A request for inspection must be made by 4:00 P.M. Monday through Friday. There will be a service charge for turn on calls and inspections after 4:30 P.M.
4. New piping will be subjected to an air pressure test of not less than 90 psig on service lines and 10 psig on house lines for at least 15 minutes and in some cases a 24 hr. test may be required.
5. Gauges used for tests shall not read more than five times the test pressure.
6. The house line test will be made with manual shut-off valves disconnected and capped off. For pipe sizes larger than two (2) inch, consult the City for testing procedures.
7. Oxygen, acetylene, ether with air or any other flammable gas shall not be used as a substitute for atmospheric air in testing lines.
8. At the time the line or lines are tested and inspected, a record shall be made by a City representative to indicate the conditions existing at the time of the test and inspection.
9. The first inspection at any premises, including both service lines and house lines, shall be without charge. In the case of a leak, error, patent defect or other unsatisfactory conditions resulting in the failure and disapproval of the test by the City, the necessary correction shall be made at the owner's expense. Once corrections are made, the City will re-inspect the line. Each additional inspection required after correction shall be subject to a service charge.
10. Service will be established only when all gas fired equipment is in a finished condition and it has been determined that the City requirements and specifications have been fully complied with.
11. The City shall be notified that the installation has been completed and a request made for a final inspection. The installing agency or their representative shall be present at the time the final inspection is made. The City representative is not authorized to light pilots or put equipment in operation.

### **Required fees for Gas Service**

Call (270)765-6121 ext. 222 for questions concerning fees for gas service.

All fees required for gas service are to be paid at City Hall at 200 West Dixie Ave. Elizabethtown, KY.

An application for gas must be completed for all commercial and industrial customer services.

Meters are issued at 300 Waterworks Dr. Ste. 107 during the hours of 7:30 A.M. - 8:30 A.M. and 1:00 P.M. - 2:00 P.M., Monday – Friday.