



## **VOLUME 15**

### **Section 6: Gas Metering Standards**

# SECTION 6

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## 1. GENERAL METERING STANDARDS

### 1.1. PURPOSE

To ensure proper design and placement of gas meters in safe, uniform, and accessible locations.

### 1.2. POLICY


Gas meter assemblies and locations shall meet all the requirements of this section, and the requirements of Section 5 (meter set drawings - GGMI). Exceptions to this or meters not shown in GGMI are considered non-standard and require Gas Engineering approval

### 1.3. UTILITY DESIGN REQUIREMENTS

The Utility Design Administrator (UDA) will gather applicant load, equipment types, project scope, and location information to determine appropriate main/service line sizing and metering configuration. The UDA can work with Gas Engineering to assist in the initial planning stage. The planning request will be routed to Gas Planning, Gas Engineering, and then to Gas Metering for planning and metering recommendations as required.

A Gas Distribution Planning Request form shall be submitted to Gas Planning & Gas Engineering by the project's UDA, for the following types of projects:

- 1.3.1. All gas main extensions or modifications to existing mains.
- 1.3.2. All gas service line installations or meter improvements exceeding 2,600 cubic feet per hour demand.
- 1.3.3. Delivery pressures higher than 7 inch Water Column (7 inch WC or 0.25 psig) require completion of a Non-Standard Gas Pressure Request Form. This form is available on the webpage:
  - I) For multi-family non-standard pressure request forms:  
[https://www.nvenergy.com/publish/content/dam/nvenergy/brochures\\_arch/account-services/building-and-new-construction/need-gas-service/service-meter-info/Multi-Family-Non-Standard-Pressure-Request.pdf](https://www.nvenergy.com/publish/content/dam/nvenergy/brochures_arch/account-services/building-and-new-construction/need-gas-service/service-meter-info/Multi-Family-Non-Standard-Pressure-Request.pdf)
  - II) For commercial non-standard pressure request forms:  
[https://www.nvenergy.com/publish/content/dam/nvenergy/brochures\\_arch/account-services/building-and-new-construction/need-gas-service/service-meter-info/Commercial-Non-Standard-Pressure-Request.pdf](https://www.nvenergy.com/publish/content/dam/nvenergy/brochures_arch/account-services/building-and-new-construction/need-gas-service/service-meter-info/Commercial-Non-Standard-Pressure-Request.pdf)
- 1.3.4. Gas meters that are considered non-standard or custom.
- 1.3.5. Excessive service lengths (over 400 feet).

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After determining the applicant load, all units need to be converted to BTU's/hour. The following table shows typical conversion factors:

Typical conversion factors are shown below:

<b>CFH or SCFH</b>	<b>MCFH</b>	<b>BTUH</b>	<b>MBH</b>	<b>MMBTU</b>	<b>THERM</b>
Cubic Feet per Hour or Standard Cubic Feet per Hour	1,000 Cubic Feet per Hour	British Thermal Units per Hour	1,000 British Thermal Units per Hour	1,000,000 British Thermal Units per Hour	100,000 BTU's
1	0.001	1,000	1	0.001	0.01
100	0.1	100,000	100	0.1	1
1,000	1	1,000,000	1,000	1	10

\*Assumed 1 cfh = 1000 BTU

## 1.4. GAS METERING DIVERSIFICATION

Load diversification is performed to ensure that main and/or service line sizing and metering capacity is not oversized for the application since the operation of all gas appliances, at maximum load, rarely occurs simultaneously. However, the meter capacity should never be less than the largest single load. The diversification factors and calculations below are for reference and may be adjusted based upon unique or special conditions that arise.

After determining the applicant load and appliance information, utilize the Gas Metering Diversification section below to determine diversified applicant loads for design.

### 1.4.1. Residential Diversification:

The following lists the factors for residential load diversification:

<b>APPLIANCE TYPE</b>	<b>FACTOR</b>
Furnace	1
Range/Oven	0.1
Tank Water Heater	0.5
Tankless Water Heater - Entire House	0.5
Tankless Water Heater – Single Appliance	1
Dryer	0.2
Fireplace	0.2
Pool/Spa Heater (year-round)	0.8
Pool/Spa Heater (summer only)	0.2
Standby Generator	0.8
Outdoor Grill/Fire pit	0.1
Driveway/Sidewalk Heating	0.8
Other process using gas	Varies

*Example Calculation:*

First, multiply each appliance quantity by its respective manufacturer's appliance BTU's/hr rating (undiversified load) AND diversification factor. Then, sum all the diversified loads. The resulting value is the total diversified load.

APPLIANCE TYPE	QTY	UNDIVERSIFIED LOAD[BTU/hr]	DIVERSIFICATION FACTOR	DIVERSIFIED LOAD[BTU/hr]
Furnace	1	100,000	1	100,000
Range/Oven	1	60,000	0.1	6,000
Tankless Water Heater – Entire House	1	140,000	0.5	70,000
Dryer	1	20,000	0.2	4,000
Fireplace	2	25,000	0.2	10,000
<b>Total</b>				<b>190,000 BTU/hr</b>

**190 CFH**

**1.4.2. Small Commercial Diversification:**

The following lists the factors for commercial load diversification, up to 2,600 CFH:

APPLIANCE TYPE	FACTOR
Furnace/Unit Heaters	1
Boilers	0.8
Range/Cooking Equipment (primary/secondary)*	0.8/0.2
Tank Water Heater	0.5
Tankless Water Heater – Entire building	0.5
Tankless Water Heater – Single Appliance	1
Dryer (primary/secondary)*	1/0.2
Fireplace	0.2
Pool/Spa Heater (year-round)	0.8
Pool/Spa Heater (summer only)	0.2
Standby Generator	0.8
Outdoor Grill/Fire pit	0.6
Other process using gas	Varies

\*Primary is commercial operation using the gas for production or manufacturing purposes. Secondary is if the equipment is not primary to the commercial operation. For example, a restaurant uses ranges/cooking equipment as primary.

*Example Calculation:*

First, multiply each appliance quantity by its respective manufacturer's appliance BTU's/hr rating (undiversified load) AND diversification factor. Then, sum all the diversified loads. The resulting value is the total diversified load.

APPLIANCE TYPE	QTY	UNDIVERSIFIED LOAD[BTU/hr]	DIVERSIFICATION FACTOR	DIVERSIFIED LOAD[BTU/hr]
Furnace/Unit Heaters	2	150,000	1	300,000
Range/Cooking Equipment (Restaurant-primary)	3	120,000	0.8	288,000
Dryer (secondary)	1	25,000	0.2	5,000
Outdoor Grill/Fire pit	2	30,000	0.6	36,000
			<b>Total</b>	<b>629,000 BTU/hr</b>
				<b>629 CFH</b>

**1.4.3. Large Commercial Diversification:** Commercial loads that exceed 2,600 CFH are considered non-standard and require evaluation on a case-by-case basis. The factors above may be used as a reference only.


Large commercial meters (rotary or turbine) shall be designed to account for minimum and maximum expected load. If the minimum load is 5% or less of the maximum meter load, two meters shall be specified to accurately account for gas usage.

## 1.5. METER LOCATION REQUIREMENTS

The UDA shall select a gas meter location that is in accordance with these standards to ensure safety, uniformity, and accessibility. The gas meter shall be located on the outside of the building to be served and shall be placed either on the sides or the front of the building from the street that the building faces.

A meter placed on the side of a building shall be placed within the first 6 feet and in front of any fencing so that the meter is easily accessible. A meter may be placed on the front of a building if requested by the applicant. For typical gas meter locations, refer to the drawings of this section.


Any request for a meter location in a non-standard location must receive prior approval from Gas Engineering and the Gas Service Center.

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The dimensions specified below shall be the distance from the meter assembly regulator vent.

The meter set assembly shall:

- 1.5.1.** Be installed on the building it serves.
- 1.5.2.** Be installed in a well-ventilated and readily accessible location.
- 1.5.3.** Be installed to ensure free access from the street. Fences shall not block free access to the assembly.
- 1.5.4.** Have a minimum clearance of 1 foot on each side and 3 feet directly in front of the assembly (with the exception of bollards). Shrubs, bushes, trees, etc., shall not be planted where they will interfere with access to the assembly.
- 1.5.5.** Have a minimum of 3 foot radial distance from the regulator vent to any opening into a building, such as opening windows and doors, foundation vents, crawl spaces, etc. Non-opening fixed windows are exempt from this requirement. See figure below for specific clearance requirements.
- 1.5.6.** Have a minimum of 3 foot radial distance from any electric meter or sub panel.
- 1.5.7.** Have a minimum of 3 foot radial distance from any source of ignition such as air intakes for sealed combustion chamber-type applications, gas appliances vents, fireplaces, electric motors, or switches, etc.
- 1.5.8.** Have a minimum of 5 foot radial distance from any mechanical draft air inlet systems such as evaporative coolers, fresh air make-up systems, etc.
- 1.5.9.** Have the house line installed by the applicant prior to the meter being set. The house line should be stubbed out 4" from the wall and shall have a 90-degree black iron elbow (consider malleable iron fitting) with inside iron pipe size threads for house lines of 2" and smaller. Larger size house lines shall have welded elbows or fittings allowed under the latest version of NFPA 54/ANSI Z223.1 National Fuel Gas Code.
- 1.5.10.** Have no mechanical fittings or controls such as water faucets, sewer clean-outs, automatic sprinkler systems controls, etc., located behind or under the assembly.


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- 1.5.11.** Not be located under stairways, fire exits, or inside any engine, boiler, heater, or electrical equipment room.
- 1.5.12.** Be protected by the applicant with guard posts when the assembly is located in an area subject to vehicular traffic. Refer to gas meter guard post detail.
- 1.5.13.** Have a fence or other suitable protective enclosure around the assembly for larger meter sets when required by NV Energy. The applicant shall provide the fence or enclosure. NV Energy will provide a lock and lock box for the enclosure.
- 1.5.14.** Have no surfacing material, such as concrete, asphalt, brick etc., within a 2” radial distance of the gas service riser. If the riser will be installed in a surfacing material, a protective PE or PVC sleeve must be installed to isolate the riser casing from the surfacing material. The diameter of the sleeve will be a minimum of 6”.
- 1.5.15.** Have no foreign metallic structures or cabling, including grounds, located within 12” of the riser.
- 1.5.16.** Not become a hazard to pedestrian traffic. It is the applicant’s responsibility to ensure gas meter locations do not become an obstacle.
- 1.5.17.** Have all house lines on a manifold meter assembly identified by the applicant with stamped metal tags showing the address for each house line as they appear on the building.
- 1.5.18.** Not encroach on city or county alley right-of-way. If installed in an alley, the assembly shall be recessed into the building and may also require bollards. Refer to 1.10 for bollard requirements.
- 1.5.19.** Meet the following requirements for a recessed assembly:
- 1.5.19.1. The riser or assembly cannot be installed within the walls or basement of a building.
  - 1.5.19.2. Applicant shall provide a 6” open channel for the service riser installation.
  - 1.5.19.3. The recess shall have a floor at a minimum of 1 foot above finish grade.
  - 1.5.19.4. Recess doors shall be fully louvered and hinged with hasp and snap provided by the applicant. NV Energy will provide a lock and lock box if doors are to be locked.

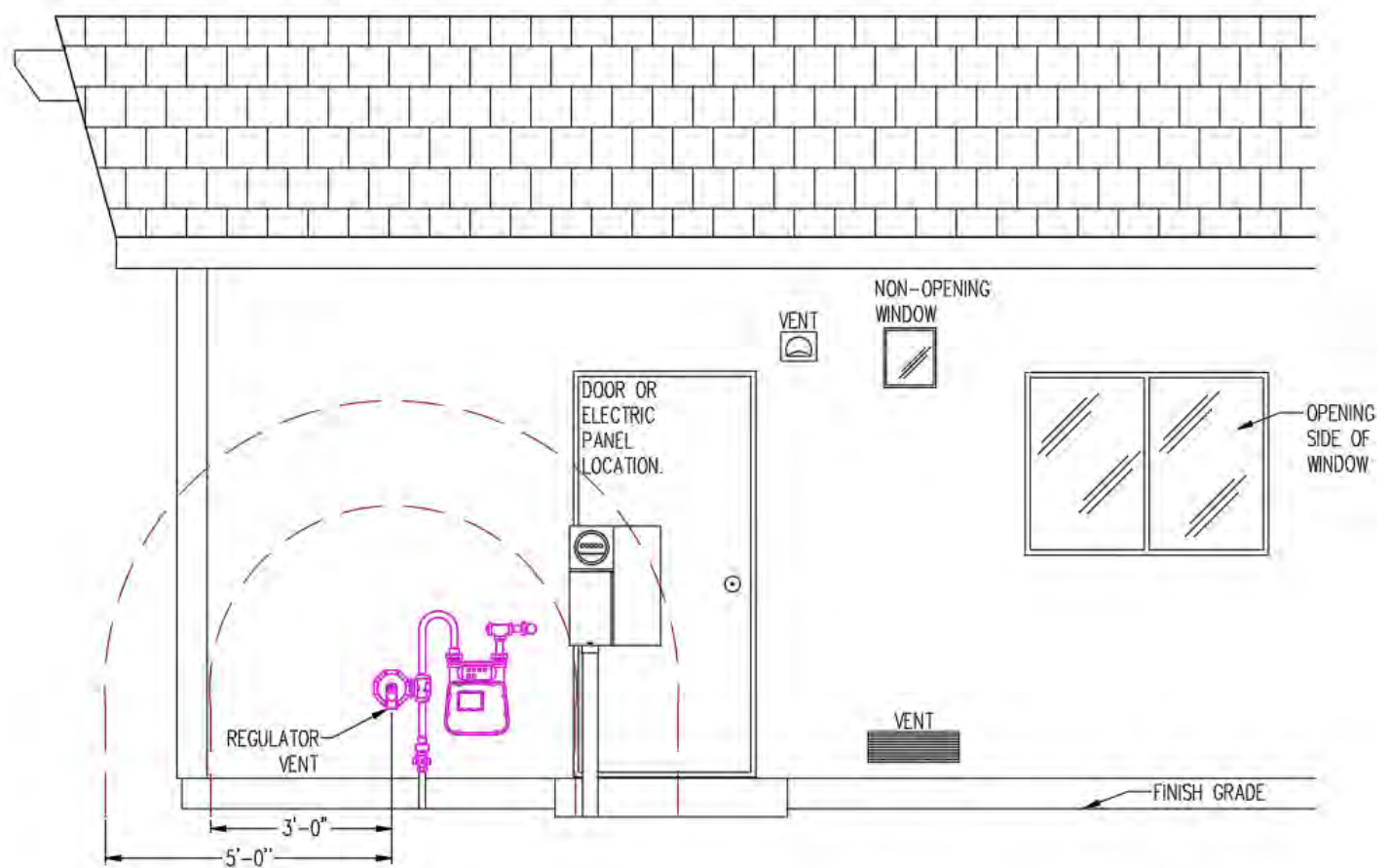
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- 1.5.19.5. Obstructions such as dumpsters, recycling bins, etc., shall not block recessed meter set assemblies, and meter set assemblies shall be protected from these types of hazards.

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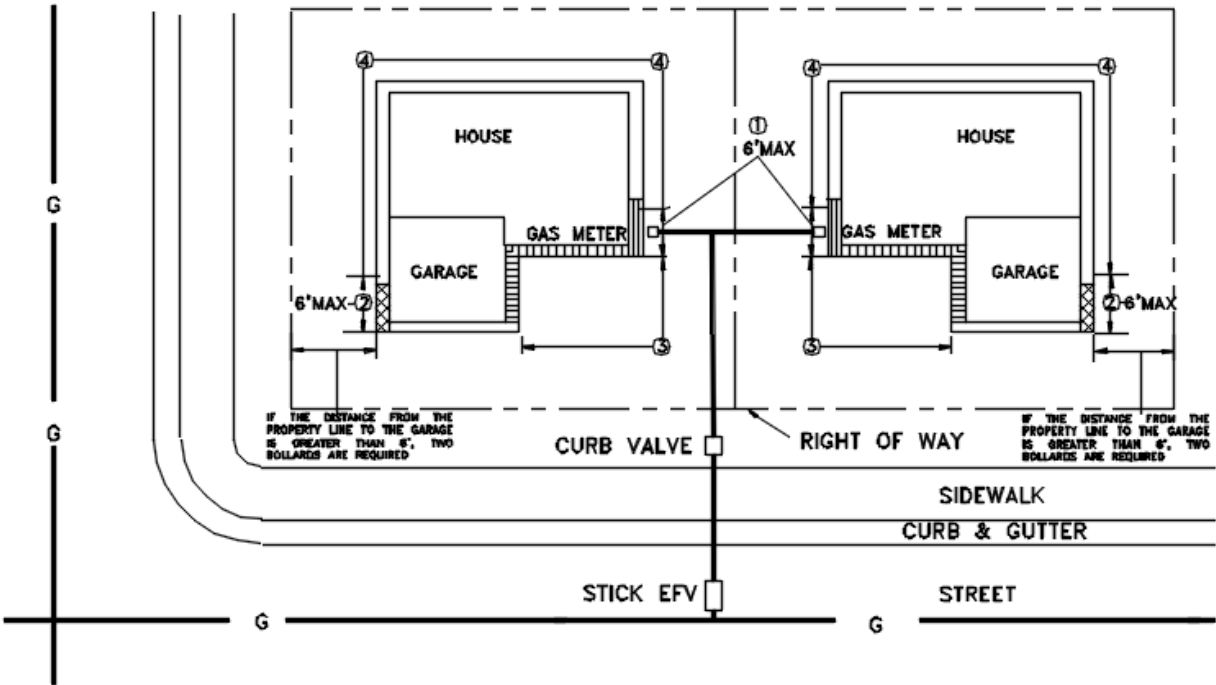
1.6. ACCEPTABLE METER CLEARANCES



THE REGULATOR VENT SHALL HAVE A MINIMUM CLEARANCE ZONE OF THREE (3) FEET FROM ANY OPENING INTO A BUILDING SUCH AS OPENING WINDOWS, DOORS, FOUNDATION VENTS, CRAWL SPACES, ELECTRIC PANELS, ELECTRIC OUTLETS, PHONE AND CATV CONDUITS, ETC, AND HAVE A MINIMUM CLEARANCE ZONE OF FIVE (5) FEET FROM POWERED AIR INTAKES (AC UNITS, SWAMP COOLERS, MAKEUP AIR VENTS, ETC.)

1.7. RESIDENTIAL SERVICE METER LOCATIONS

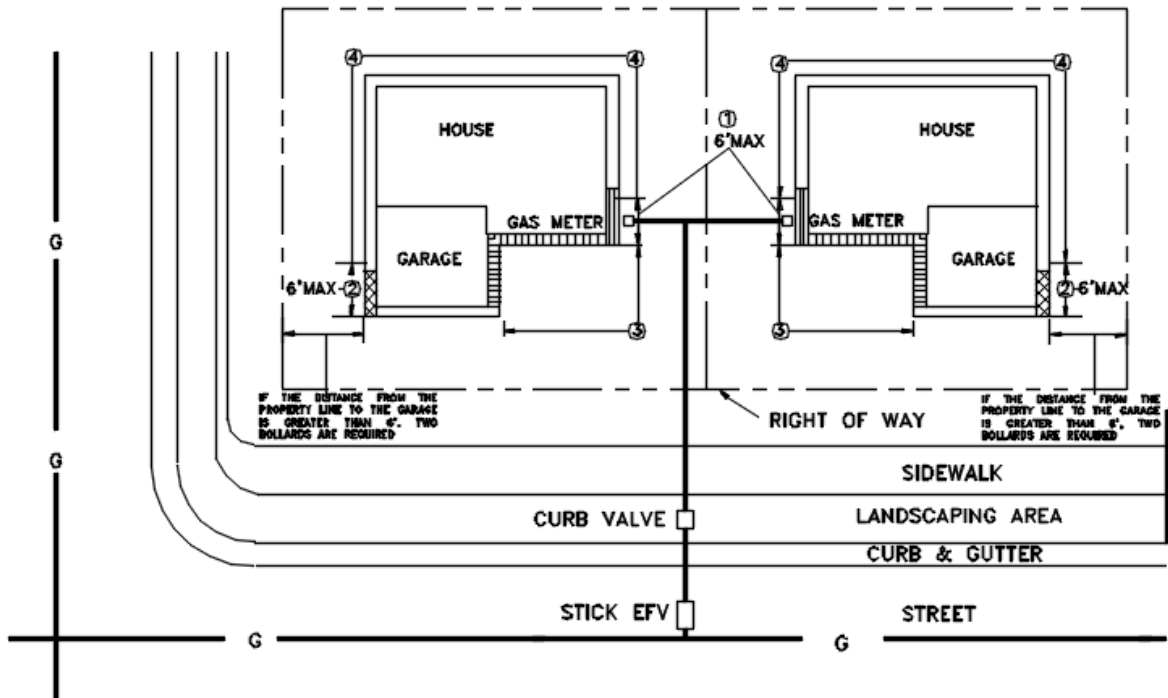
For scenarios where the curb and sidewalk are directly connected:



NOTES:

- A) GAS METER LOCATION:
  - AREA ① - PREFERRED GAS METER LOCATION
  - AREA ② - LOCATION IF SERVICE STUB DICTATES SUCH
  - IF THE DISTANCE FROM THE PROPERTY LINE TO THE GARAGE IS GREATER THAN 6', TWO BOLLARDS ARE REQUIRED
  - AREA ③ - ACCEPTABLE LOCATION IF REQUESTED BY APPLICANT
  - AREA ④ - UNSUITABLE GAS METER LOCATION
- B) REFER TO SECTION 6 FOR GENERAL GUIDELINES
- C) ANY REQUEST FOR A METER LOCATION IN A NON-STANDARD LOCATION MUST RECEIVE PRIOR APPROVAL FROM GAS ENGINEERING AND THE SERVICE CENTER
- D) WHERE GAS SERVICE STUBS EXIST, ALL EFFORTS SHALL BE MADE TO UTILIZE SUCH STUBS. CONTACT OPERATIONS TO VERIFY STUB LOCATIONS. IN NO CASE WILL SERVICES RUN COMPLETELY ACROSS THE FRONT OF A BUILDING.

For scenarios where a landscaping section or other gap exists between the curb and sidewalk:



NOTES:

- A) GAS METER LOCATION:  
 AREA ① – PREFERRED GAS METER LOCATION  
 AREA ② – LOCATION IF SERVICE STUB DICTATES SUCH  
 IF THE DISTANCE FROM THE PROPERTY LINE TO THE GARAGE IS GREATER THAN 6', TWO BOLLARDS ARE REQUIRED  
 AREA ③ – ACCEPTABLE LOCATION IF REQUESTED BY APPLICANT  
 AREA ④ – UNSUITABLE GAS METER LOCATION
- B) REFER TO SECTION 6 FOR GENERAL GUIDELINES
- C) ANY REQUEST FOR A METER LOCATION IN A NON-STANDARD LOCATION MUST RECEIVE PRIOR APPROVAL FROM GAS ENGINEERING AND THE SERVICE CENTER
- D) WHERE GAS SERVICE STUBS EXIST, ALL EFFORTS SHALL BE MADE TO UTILIZE SUCH STUBS. CONTACT OPERATIONS TO VERIFY STUB LOCATIONS. IN NO CASE WILL SERVICES RUN COMPLETELY ACROSS THE FRONT OF A BUILDING.

**1.7.1.** For branch services where the homes are staggered, the primary service line should be run on the left side property. In cases where this cannot or has not happened, the branch to the second home should cross the property line at 90 degrees at a location that minimizes the length of service pipe in the branch property. All service lines should be run 30" off the property line regardless of which property the service runs on.

The gas meter should be set in an easily accessible location preferably within 6 feet of the face of the building and in front of any fencing.

### 1.8. COMMERCIAL SERVICE METER LOCATIONS

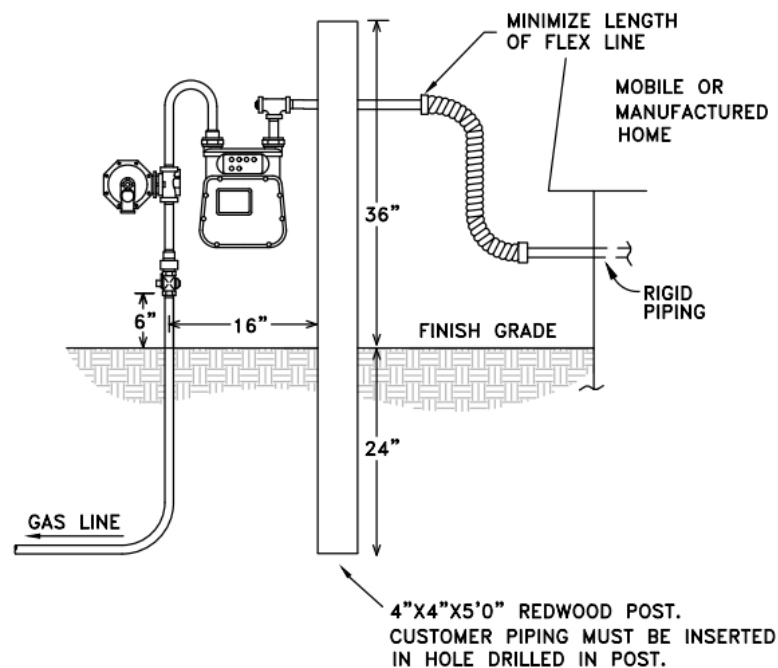
Commercial gas meter locations must be coordinated through one of the UDAs and must comply with the General Guidelines of this section. When applicants request a gas meter location behind a building, that location will be limited by the fact that NV Energy's service line will only run around one corner of a building and the length of that service line shall be minimized. Commercial gas service lines that parallel a building must maintain a minimum 5 foot clearance from the structure.


There must be at least three feet of clearance around the meter set for NV Energy personnel to perform work (this includes within any fencing). NV Energy must be able to reasonably access the meter set with equipment (trucks, boom, etc.) for moving of large components.

### 1.9. MOBILE AND MANUFACTURED HOME METER LOCATIONS

Mobile and manufactured homes shall follow the same requirements of this standard. The addition of a meter post, as shown below, will be the responsibility of the applicant. Deviation from this design will require approval from Gas Engineering and Gas Service.

All customer piping shall comply with the National Fuel Gas Code. The length of the customer flex line shall be the shortest practical length and shall not extend through any walls, ceilings, floors, etc. The flex line should be protected from damage.

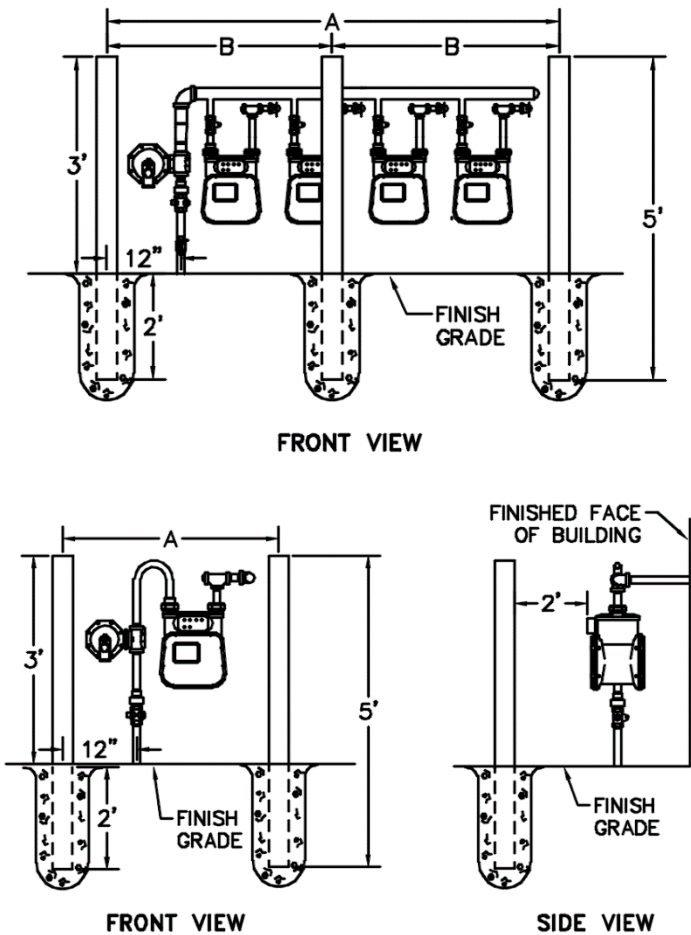


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### 1.10. GAS METER GUARD POSTS

The location of the meter set shall be optimized to decrease risk of damage to the meter set. Bollards shall be installed on meter sets that may be exposed to vehicular damage including RVs and trailers. The customer is responsible for installing bollards to these specifications and at the discretion of the NV Energy Gas Service Center. A meter will not be set until all bollard requirements are met.

Bollards shall be 4" schedule 40 steel filled with concrete. Bollards shall be 5 feet long and buried 2 feet in concrete, unless otherwise specified or approved by Gas Engineering and Service Center. Bollards shall be painted to prevent weather damage, but there are no color requirements for bollards after they have been installed. Appropriate clearance must be maintained around the meter set for maintenance work by NV Energy. The following details and Tables 1-2 specify the standards for bollard configurations. If needed, the configuration may be changed at the discretion of the NV Energy Gas Department to provide the adequate protection to the meter set.



NOTES:

1. BOLLARDS SHALL BE INSTALLED PER THIS STANDARD IN AREAS WHERE METER SETS MAY BE SUBJECT TO VEHICULAR TRAFFIC.
2. BOLLARD DIMENSIONS AND CONSTRUCTION SHALL COMPLY WITH THIS STANDARD.
3. BOLLARDS SHALL NOT BE PLACED AT GREATER THAN 3' CENTERS.
4. THERE SHALL BE 2' OF SEPARATION BETWEEN THE FACE OF THE METER AND THE BOLLARD. EXCEPTIONS MAY BE MADE IN RESIDENTIAL AREAS BASED ON THE TYPE OF VEHICULAR TRAFFIC AND METER LOCATION.
5. THE EXACT BOLLARD LOCATION AND LAYOUT MAY VARY FROM THIS DRAWING DEPENDING ON SERVICE LOCATION, METER LOCATION AND THE TYPE OF VEHICULAR TRAFFIC. THE CONFIGURATION THAT WILL PROVIDE THE GREATEST PROTECTION TO THE METER SET SHALL BE USED.
6. BOLLARD SHALL BE PLACED A MINIMUM OF 12" FROM BOTH ABOVE AND UNDERGROUND RISER/SERVICE PIPE.

1.10.1. TABLE 1: RESIDENTIAL METERING -METER BOLLARD DIMENSIONS

COMPATIBLE UNIT	METER SIZE	# OF METERS	DIMENSIONS		# OF POSTS
			A	B	
GGMI-AAA	250	1	3' 0"		2
GGMI-ABA	250	2	5' 0"	2' 6"	3
GGMI-ACB	250	3	5' 0"	2' 6"	3
GGMI-ADB	250	4	6' 0"	3' 0"	3
GGMI-AEB	250	4 STACKED	5' 0"	2' 6"	3
GGMI-AFB	250	5	8' 0"	2' 8"	4
GGMI-AGC	250	6	9' 0"	3'	4
GGMI-AHC	250	6 STACKED	5' 0"	2' 6"	3
GGMI-AIC	250	7	9' 0"	3'	4
GGMI-AJC	250	8	11' 0"	2' 9"	5
GGMI-AKC	250	8 STACKED	6' 0"	3'	3
GGMI-ALC	250	10 STACKED	8' 0"	2' 8"	4
GGMI-AMC	250	12 STACKED	9' 0"	3'	4
GGMI-ANC	250	14 STACKED	9' 0"	3'	4
GGMI-AOC	250	16 STACKED	11' 0"	2' 9"	5
GGMI-BAB / GGMI-CAB	425 / 630	1	3' 0"		2

1.10.2. TABLE 2: COMMERCIAL METERING – METER BOLLARD DIMENSIONS

COMPATIBLE UNIT	METER SIZE	# OF METERS	DIMENSIONS		# OF POSTS
			A	B	
GGMI-BAB	425 CFH	1	3'	-	2
NON STANDARD	425 CFH	2	6'	3'	3
NON STANDARD	425 CFH	3	7'	2' 4"	4
NON STANDARD	425 CFH	4	9'	3'	4
NON STANDARD	425 CFH	4 METER STACKED	6'	3'	3
GGMI-CAB	630 CFH	1	3'	-	2
NON STANDARD	630 CFH	2	6'	3'	3
NON STANDARD	630 CFH	3	7'	2' 4"	4
GGMI-FAC	1000 CFH	1	3'	-	2
GGMI-FBC	1000 CFH	2	6'	3'	3
GGMI-FCD	1000 CFH	3	7'	2' 4"	4
GGMI-FDD	1000 CFH	4	9'	3'	4
GGMI-FFD	1000 CFH	5	10'	2' 6"	5
GGMI-FGD	1000 CFH	6	11'	2' 9"	5
GGMI-GAC / GGMI-GBD	2 M	1 METER / STACKED	7'	2' 4"	4
GGMI-HAC / GGMI-HBD	3 M	1 METER / STACKED	7'	2' 4"	4
GGMI-JAD / GGMI-JBD	5 M	1 METER / STACKED	8'	2' 7"	4
GGMI-LAD	7 M	1 METER	8'	2' 7"	4
GGMI-MAD	11 M	1 METER	9'	3'	4

Note: Bollards may be added or the dimensions altered such that the entire meter assembly is protected.



## 2. EXCESS FLOW VALVES

### 2.1. GENERAL INFORMATION

Excess flow valves (EFVs) are valves designed to automatically close and stop the flow of gas when the flowrate exceeds the capacity of the valve. EFVs capacity ratings are also dependent on service length. There are two types of EFVs used in the NV Energy system:

**2.1.1.** Stick EFVs are excess flow valves built into a stick of pipe that may be welded or fused into a service

**2.1.2.** Combo EFVs are excess flow valves where the EFV doubles as a curb valve

### 2.2. APPLICATIONS AND QUALIFICATIONS FOR EFVs

**2.2.1.** An EFV must be installed on any new or replaced service line serving the following types of services before the line is activated (gas introduced):

2.2.1.1. A single service line to one single family residence (SFR)

2.2.1.2. A branched service line to a SFR installed concurrently with the primary SFR service line (i.e., a single EFV may be installed to protect both service lines)


2.2.1.3. A branch service line to a SFR installed off a previously installed SFR service line that does not contain an EFV or contains an EFV that will be inadequate once the branch is installed

2.2.1.4. Single family and multifamily residences with known customer loads not exceeding the largest approved EFV in the NV Energy catalog, at time-of-service installation based on installed meter capacity

2.2.1.5. A single, commercial customer served by a single service line with a known customer load not exceeding the largest approved EFV in the NV Energy catalog, at the time of meter installation, based on installed meter capacity

**2.2.2.** Multiple meter manifolds will be utilized when conditions allow but will not be used when the capacity of the services exceed EFV ratings.

**2.2.3.** Appropriately sized EFVs may be installed on existing service lines of a different size with Gas Engineering approval

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### 2.3. EFV SELECTION

- 2.3.1.** After selecting a meter, determine if the service requires an EFV per the criteria described in 2.2. All service lines shall be designed to have EFVs installed whenever possible.
- 2.3.2.** Determine service length; if branched, select the length from the main to the furthest meter.
- 2.3.3.** Refer to EFV sizing Tables 4 and 5 and found in Part 3 of this section to select an EFV that satisfies the undiversified load and protected length requirements. Gas Engineering shall assist in EFV sizing if needed.
- 2.3.3.1.** For standard installations, a stick EFV with an accompanying curb valve shall be installed. If a curb valve cannot be installed, a solo stick EFV or combo EFV may be installed at the NV Energy gas inspector's discretion.
- 2.3.3.2.** A combo EFV may be used where a stick EFV and curb valve would be located close to each other or where space constraints prevent them from being installed separately.
- 2.3.3.3.** A combo EFV may be installed when installing a stick EFV is not practical at the NV Energy gas inspector's discretion.
- 2.3.3.4.** A combo EFV may be installed on the last service of a main to aid in purging at the NV Energy gas inspector's discretion.

### 2.4. EFV INSTALLATION LOCATION

- 2.4.1.** All EFVs shall be installed in a location that maximizes the protected length of the service while accounting for future maintenance or access requirements. The following requirements are assuming the criteria in 2.2 have been satisfied. Gas Engineering and Operations may be consulted for guidance on EFV installation location.
- 2.4.2.** For new or replaced services, an EFV shall be placed as close to the main as practicable.
- 2.4.2.1.** Stick EFVs shall be installed as close to the main as practicable. Any accompanying curb valve shall be placed as close to the property line as possible and out of any roadways.
- 2.4.2.2.** Combo EFVs shall be placed as close to the main as possible without being in any roadways. This will usually be behind the curb or walkway at a location that can be easily maintained.

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- 2.4.2.3. In situations where a landscaping space or other gap is maintained between the sidewalk and curb, the combo EFV (or curb valve if using a stick EFV) shall be installed in the landscaping section behind the curb but in front of the sidewalk.
- 2.4.2.4. Services with an EFV may be stubbed out past the sidewalk. The end cap shall be marked with a stake, line marker, or similar material that is painted yellow and marked as gas with tracer wire attached above ground.

**2.4.3.** For branched service lines, the location of the EFV can vary based on the situation.

- 2.4.3.1. For a new or fully replaced primary and branch service installation, the same guidelines apply as those described in 2.4.2. However, the EFV must be sized to provide adequate protection for both the primary and branch lines.
- 2.4.3.2. For a new branch being added onto an existing single service with an existing EFV:
  - 2.4.3.2.1. If the existing EFV has enough capacity and protectable length for both meters, it can be left in place.
  - 2.4.3.2.2. If the existing EFV does NOT have enough capacity or protectable length, it shall be replaced so that both primary and branch have adequate protection.
  - 2.4.3.2.3. If replacing the EFV is not practical, run a new single service instead of a branch.
- 2.4.3.3. For a new branch being added to an existing single service that does NOT have an existing EFV, install a new EFV with adequate capacity and protectable length for both the primary and branch as close to the main as practicable, or at the nearest non-paved point to the main.
  - 2.4.3.2.4. If installing a new EFV on the existing service line is not practical, run a new service line instead of a branch.


**2.4.4.** For service completions on existing stubs, the applications for EFVs vary based on the status of the stub.

- 2.4.4.1. If the roadway above the main has not been paved when doing a service stub completion, follow the guidelines described in 2.4.2.
- 2.4.4.2. If the roadway above the main has been paved, install an EFV as close to the main as possible at the nearest non-paved point.
- 2.4.4.3. If the service stub is already branched or will be branched, follow the guidelines in 2.4.3.

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**2.5. GENERAL EFV INSTALLATION REQUIREMENTS**

- 2.5.1.** Install all EFVs following the manufacturer's instructions and procedures.
- 2.5.2.** When installing an EFV, ensure the directional arrow on the EFV matches the direction of gas flow in the pipe.
- 2.5.3.** For plastic EFVs that come with factory-fused pups, the pups may be cut and re-fused as needed for proper installation as long as the proper fusion procedures are followed.
- 2.5.4.** When installing a steel EFV, use the most current NV Energy approved welding procedure. Place a wet rag over the EFV and keep heat away from the EFV when welding.
- 2.5.5.** Do NOT allow any dirt or debris to enter the body of the EFV or service pipe.
- 2.5.6.** Do NOT squeeze an EFV


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### 3. GAS SERVICE AND METER DESIGN

#### 3.1. GENERAL INFORMATION

The following general guidelines must be followed when designing services and metering configurations:

- 3.1.1.** Standard main and service line locations shall be preferred to ease locating, maintenance, and damage prevention efforts. The gas service line will generally be installed in a straight-line perpendicular to the gas main and routed in a manner to be accessible for future maintenance. Ninety-degree elbows should be used to change direction on a service line.
- 3.1.2.** Gas service lines will not be installed beneath buildings or structures. This includes decks, porches, gazebos, pools, planters, retaining walls, trees, etc.
- 3.1.3.** Service lines will not be extended from one building to another.
- 3.1.4.** Creation of primary customer owned yard lines (COYL) is prohibited without justifying circumstances. Justifying circumstances include but are not limited to, unique field conditions, property rights, security/access issues, and large residential, commercial, or industrial customers where installation of a primary COYL is required to initiate service. Justifying circumstances do not include instances of customer convenience, cost avoidance, or to avoid current Utility installation standards. Refer to NV Energy Gas Tariff 16 for additional statutory regulations.
- 3.1.5.** The amount of installed underground facilities should be minimized.
- 3.1.6.** All meters shall be installed outdoors at a point agreeable to the property owner or building contractor and NV Energy. The meter must be installed in a readily accessible location and be protected from damage. If it is not possible to meet these requirements, the installation is considered non-standard and will be referred to Gas Engineering for approval.
- 3.1.7.** All service taps should be installed off 6" diameter or smaller mains. Tapping a service off a larger main requires Gas Engineering approval.

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### 3.2. METER, MAIN, AND SERVICE LINE SIZING

**3.2.1.** Gas Engineering will design and size gas mains using a computational flow model for existing and future gas needs. UDAs will size services considering the following factors.

- 3.2.1.1. Single service vs branched service
- 3.2.1.2. Single meter versus multi-meter manifold
- 3.2.1.3. Diversified load for each service
- 3.2.1.4. EFV requirements

**3.2.2.** The UDA shall use the following steps to size a **Single Meter** gas service:


- 1. Diversify load per 1.4
- 2. Select meter and riser/service size using the **diversified load** and Table 3
- 3. Refer to 2.3. and Tables 4 or 5 to select an EFV that satisfies both undiversified load and protectable length requirements
- 4. Verify the selected EFV and riser/service size match
- 5. Contact Gas Engineering if they do not match

**3.2.3.** The UDA shall use the following steps to size a **Multi-Meter Manifold** gas service:

- 1. Diversify load per 1.4
- 2. Select meter and riser/service size using the **diversified load** and Table 3
- 3. Refer to 2.3. and Tables 4 or 5 to select an EFV that satisfies both undiversified load and protectable length requirements
- 4. Use Tables 6-10 for multi-meter manifold installations with identical meter sizes to determine the riser/service size and the corresponding CU based on the number of meters to be installed.
- 5. If one or more meters in the manifold require a unique class/capacity, contact Gas Engineering.

**3.2.4.** Contact Gas Engineering if one of the following conditions exist:

- 3.2.4.1. The EFV size and riser/service size do not match
- 3.2.4.2. Multi-meter manifold requires different class/capacity meters (i.e., one 250 and one 425)
- 3.2.4.3. The compatible unit states “Custom” in Tables 6-10
- 3.2.4.4. Customer requests non-standard delivery pressure for any meter in a manifold.
- 3.2.4.5. If the EFV cannot be sized using Tables 4 or 5

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**3.2.5. TABLE 3: GAS METER SELECTION TABLE**

**To use Table 3:** Use the maximum diversified load and desired metering pressure to find the corresponding meter class/capacity, riser/service size, and CU.

<b>Single Riser/Service Gas Meter Selection Table</b>									
<b>Meter Class/Capacity</b>	<b>250/275</b>	<b>425</b>	<b>630</b>	<b>1000</b>	<b>2M</b>	<b>3M</b>	<b>5M</b>	<b>7M</b>	<b>11M</b>
<b>CU Listing</b>	GGMI-AAA	GGMI-BAB	GGMI-CAB	GGMI-FAC	GGMI-GAC	GGMI-HAC	GGMI-JAD	GGMI-LAD	GGMI-MAD
<b>Riser/Service Size (in.)</b>	3/4"	1"	1"	1-1/4"	1-1/4"	1-1/4"	2"	2"	2"
<b>Metering Pressure (PSIG)</b>	<b>Maximum Diversified Load (SCFH)</b>								
	Max	Max	Max	Max	Max	Max	Max	Max	Max
0.25 (7" w.c.)	300	510	780	1,210	1,720	2,590	4,310	6,040	9,480
1	320	540	820	1,280	1,830	2,740	4,570	6,390	10,040
2	340	580	880	1,370	1,960	2,940	4,900	6,870	10,790
3	370	620	940	1,470	2,100	3,150	5,240	7,340	11,540
5	410	700	1,070	1,660	2,370	3,550	5,920	8,290	13,030

**3.2.6. TABLE 4: STICK EFV SIZING TABLE**

**To use Tables 4 and 5:** Use the total undiversified load and design service length to find the corresponding EFV. The EFV material shall match the material of the service

Stick EFV Sizing for 3/4" to 2" Pipe								
Total Connected Undiversified Load	Maximum Protected Service Length (ft)					EFV Class	PE Stick EFV	Steel Stick EFV
(scfh)	0-200	400	600	800	1000	-	Stock #	Stock #
0 ≤ Load < 750	3/4" Pipe (up to 1000')					700/800	432050	432043
750 ≤ Load < 1800	1" Pipe (up to 780')				N/A	1800	432051	432044
1800 ≤ Load < 2600	1-1/4" Pipe (up to 970')					2600	432052	432045
2600 ≤ Load < 5500	1-1/4" Pipe (up to 270')		N/A			5500	432053	432046
	2" Pipe (up to 1000')					5500	432054	432047
5500 < Load < 10000	CONTACT GAS ENGINEERING					10000	432055	432048

**3.2.7. TABLE 5: COMBO EFV SIZING TABLE**

Combo EFV Sizing for 3/4" to 1-1/4" Pipe									
Total Connected Undiversified Load	Maximum Protected Service Length (ft)						EFV Class	PE Combo EFV	Steel Combo EFV
(scfh)	0-1000	1200	1400	1600	1800	2000	-	Stock #	Stock #
0 ≤ Load < 725	3/4" Pipe (up to 1350')			N/A			700/800	432001	432025
725 ≤ Load < 1600	1" Pipe (up to 960')	N/A					1800	432011	432026
1600 ≤ Load < 2350	1-1/4" Pipe (up to 1900')						2600	432021	432027
2350 ≤ Load < 10000	NOT AVAILABLE: REFER TO STICK EFV TABLE								


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Table 6: 250 CFH Multi-Meter Manifold

Configuration	Compatible Unit	Riser/Service Size [in.]
1 Meter	GGMI-AAA	3/4"
2 Meter	GGMI-ABA	3/4"
3 Meter	GGMI-ACB	1"
4 Meter	GGMI-ADB	1"
4 Meter Stacked	GGMI-AEB	1"
5 Meter	GGMI-AFB	1"
6 Meter	GGMI-AGC	1-1/4"
6 Meter Stacked	GGMI-AHC	1-1/4"
7 Meter	GGMI-AIC	1-1/4"
8 Meter	GGMI-AJC	1-1/4"
8 Meter Stacked	GGMI-AKC	1-1/4"
10 Meter Stacked	GGMI-ALC	1-1/4"
12 Meter Stacked	GGMI-AMC	1-1/4"
14 Meter Stacked	GGMI-ANC	1-1/4"
16 Meter Stacked	GGMI-AOC	1-1/4"

Table 7: 425 CFH Multi-Meter Manifold

Configuration	Compatible Unit	Riser/Service Size [in.]
2 Meter	NON STANDARD	1-1/4"
3 Meter	NON STANDARD	1-1/4"
4 Meter	NON STANDARD	1-1/4"
4 Meter Stacked	NON STANDARD	1-1/4"
5 Meter	NON STANDARD	1-1/4"
6 Meter	NON STANDARD	2"

Table 8: 630 CFH Multi-Meter Manifold

Configuration	Compatible Unit	Riser/Service Size [in.]
2 Meter	NON STANDARD	1-1/4"
3 Meter	NON STANDARD	1-1/4"
4 Meter	NON STANDARD	2"
5 Meter	NON STANDARD	2"
6 Meter	NON STANDARD	2"

Table 9: 1000 CFH Multi-Meter Manifold

Configuration	Compatible Unit	Riser/Service Size [in.]
2 Meter	GGMI-FBC	1-1/4"
3 Meter	GGMI-FCD	1-1/4"
4 Meter	GGMI-FDD	1-1/4"
5 Meter	GGMI-FFD	1-1/4"
6 Meter	GGMI-FGD	2"

Table 10: Stacked Rotary Meter Manifolds

Configuration	Compatible Unit	Riser/Service Size [in.]
2M Stacked	GGMI-GBD	2"
3M Stacked	GGMI-HBD	2"
5M Stacked*	GGMI-JBD	2"

\*Gas Engineering approval required

Tables 6 through 10 are for guidance only. Services that require a meter set larger and/or in a different configuration than those listed above are considered non-standard and their application will be subject to approval by Gas Engineering and Gas Service Center. Meters that require volumetric correction or regulation downstream of the meter are custom, and will be subject to approval by Gas Engineering and Gas Meter Shop.