

Meter Rooms, Vaults and Pads

General

Meter enclosures shall be constructed in accordance with this subsection.

Meter enclosures that are not required, but are desired by a customer, shall also comply with this subsection except where exempted herein.

All meter enclosures shall be supplied by and at the expense of the customer.

Meter enclosures shall not be used for storage purposes.

Meter Enclosures

There are four types of meter enclosures:

- Meter house, which is an enclosure attached to or separate from the main structure.
- Meter recess, which is an indentation constructed in the outside wall of the main structure.
- Fenced enclosure, which may be any other outside enclosure designed to protect the meter set and/or desired for aesthetics.
- Meter vault, defined as an enclosure considered to be internal to the building design, located either above or below grade.

General Rules for Construction

The following rules shall be adhered to when constructing a meter enclosure:

- The enclosure shall be directly accessible from the outside of the main structure but may have one or more common walls between it and the main structure. Each common wall shall not have any openings and shall be substantially impervious to the passage of air or vapors. Below grade meter vaults are excluded.
- A meter house or vault containing a Group III or IV meter shall have a concrete floor at least 4" thick or shall have a meter pad.
- The top surface of the floor or pad shall be at least 4" above surrounding grade with drainage away from it. Below grade meter vaults are excluded.
- A meter house shall have a 3' wide by 6'-8" high louvered door which swings outward. Any other enclosure being enclosed on all sides shall have a 3' wide door or gate that swings outward, which shall be as high as the enclosure but need not exceed a height of 6'-8".
- A meter house or any other enclosure which is relatively air tight shall be provided with ventilation by either louvers in the door, grills located at the bottom and at the top of an outside wall, a roof ventilator accompanied by a grill near the bottom of the enclosure, or mechanical ventilation (see Figures 8.8.1 and 8.8.2).

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- Meter vaults located below ground level may require special considerations in regard to adequate ventilation and access for large meter equipment. These shall be handled as a "Special Case" and the division engineering office shall be consulted prior to advising the customer of our requirements.
- Electrical wiring and fixtures are not normally required but may be desirable in unusually dark enclosures. A vault, however, does require electrical wiring and fixtures. If provided, electrical wiring and fixtures shall be of the explosion proof type.
- A fenced enclosure required by the previous subsection shall be a galvanized steel chain link fence at least 7' high. The fabric shall be a minimum of 9 gauge with 2" square mesh. The corner and gate post shall be a minimum of 3" nominal O.D., rails and gate frame shall be a minimum of 1-5/8" nominal O.D., and line posts shall be a minimum of 2-1/2" nominal O.D. The gate shall be no less than 36" wide.
- A fenced enclosure at a school shall be enclosed on the top to prevent unauthorized entrance.
- All enclosures, except for required meter houses or vaults, shall permit reading of the meter index without unlocking doors or gates, or without the removal of covers, panels or other objects. Chart type recording equipment is excluded from this provision. Refer to the *Minimum Dimensions for Meter Enclosures and Pads*, Tables 8.8.1 and 8.8.2.
- Enclosures required by the previous subsection shall be provided with a lock. The lock shall be either built-in or of the hasp type. For a built -in lock, the Company shall supply a lock box in which the customer supplied key shall be kept. The key shall be attached to the lock box drawer. For a hasp type lock, the Company shall furnish a locking bar to accommodate 2 padlocks, one furnished by the Company and the other by the customer. An option, available in some divisions, is a company supplied lock cylinder or padlock, master keyed to fit the Xcel Energy master key and a key to give to the customer. The customer gets the customer key that fits the lock. Do not give the customer a copy of the master key.

Meter Pads

A concrete pad will be furnished by the Company whenever the meter being set is a Group II meter weighing over 70 pounds. These pads are 2' x 2' x 4" dimensionally and are available through Stores. The top surface of a pad shall be at least 4" above grade with drainage away from it. Group II an IV meters requiring a meter pad shall be supplied by the customer. See Tables 8.8.1 and 8.8.2.

Exceptions

When it is impossible to adhere to these rules, the Operations Manager or the appropriate Division Engineer shall be responsible for making the decision regarding any exceptions.

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Table 8.8.1 – Minimum Dimensions for Meter Enclosures and Pads Diaphragm Meters				
Meter Nominal Pipe Size (in)	Meter House	Meter Recess	Meter Pad	Fenced Enclosure
¾ to 1-1/2 ** Except 30B Metric and 35B Metric	3' long 2' wide 3' high	2' deep 3' wide 3' high	None Required	3' long 3' wide 3' high *
2 Including 30 B Metric and 35B Metric	5' long 4' wide 7' high	2' deep 5' wide 4' high	2' long 2' wide 4" thick	5' long 4' wide 7' high
4	8' long 6' wide 7' high 8' x 10' for dual meters	6' deep 8' wide 7' high 8' x 10' for dual meters	4' long 4' wide 4" thick 6' x 8' for dual meters	8' long 6' wide 7' high * 8' x 10' for dual meters

* The height of this fenced enclosure is optional only when the fence is not required by the Company.
 ** The 800 American and Rotary meters under 2" do not require pads.

Table 8.8.2 – Minimum Dimensions for Meter Enclosures and Pads Rotary and Turbine Meters				
Meter Nominal Pipe Size (in)	Meter House	Meter Recess	Meter Pad	Fenced Enclosure
3 and under *	6' long 6' wide 7' high	6' deep 6' wide 7' high	2' long 2' wide 4" thick	6' long 6' wide 7' high
4	8' long 6' wide 7' high	6' deep 8' wide 7' high	8' long 6' wide 4" thick	8' long 6' wide 7' high
6	12' long 8' wide 7' high	8' deep 12' wide 7' high	8' long 6' wide 4" thick	12' long 8' wide 7' high
8	18' long 8' wide 7' high	8' deep 18' wide 7' high	8' long 6' wide 4" thick	18' long 8' wide 7' high

* The 800 American and Rotary meters under 2" do not require pads

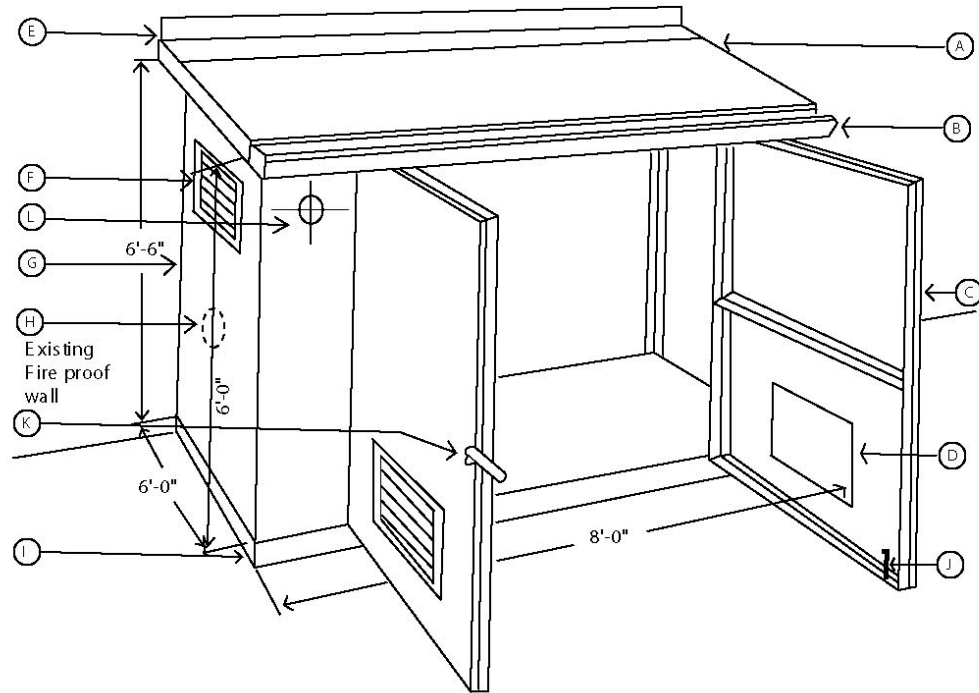


Figure 8.8.1 - Typical Enclosure up to One 500-B Meter

Notes:

- To be used for large commercial metering equipment, when required, where space is at a premium.
- Generally, enclosures shall be located along an unobstructed wall nearest to distribution facilities.

- A. Fireproof roof capable of supporting the expected snow load.
- B. Gutter.
- C. 3'-6" x 5'-6" double doors.
- D. 12" x 18" screened louver in bottom half of doors.
- E. Flashing at roof and existing wall.
- F. 12" x 18" screened louver in wall - one each side.
- G. No metal back required if existing wall is continuous.
- H. Inlet and outlet piping openings as required.
- I. 4" concrete slab on adequate footings.
- J. Locking bar.
- K. Double locking hasp.
- L. Relief valve exhaust opening as required.

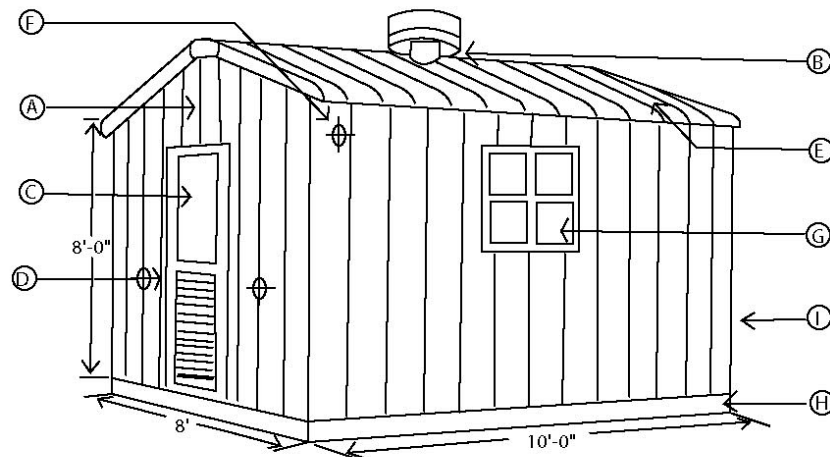


Figure 8.8.2 - Typical Enclosure Permanent Enclosure

Notes:

- To be used as permanent protection for large commercial meter sets when required. To be erected at the customer's expense.
- Electrical lighting fixtures and switches if installed, shall be explosion proof.

- A. Enclosure to be fireproof construction (i.e. metal or masonry).
- B. 12" minimum stationary roof ventilator. Ridge ventilation optional.
- C. 3'-0" x 6'-8" standard metal door, bottom half louver opens out.
- D. Inlet and outlet piping openings as required.
- E. Metal pitched roof. Flat roof is optional as is the type of material.
- F. Relief valve exhaust opening as required.
- G. 4-pane metal window - one in each side of enclosure.
- H. 4" concrete slab on adequate footing.
- I. No openings in back wall.

Meter Vaults

Scope

These general specifications are to be used as a definition of Company policy concerning the installation of gas meters and pressure regulating devices below grade or within the customer's structure. These shall be understood to be minimum requirements. Any change in these specifications must be approved by the Company. The Company will not provide gas service to the customer from a gas meter vault until the vault is completed according to Company specifications.

Service Load and Pressure

It will be necessary to obtain from the customer the attached load in cubic foot per hour (cfh) and the requested fuel line pressure. The Company will not install a service to an inside vault (or a vault which is accessed from within the structure) when the gas distribution system is designated as an Intermediate (30-150 psig) or High Pressure System.

Size of Vault

The vault shall be of sufficient size that all of the required equipment can be properly installed, operated, and maintained. The vault dimensions shall be approved by the Company Engineer assigned to the project. Tables 8.8.1 and 8.8.2 may be used as a guideline, but the vault shall generally be at least 8' long x 6' wide x 7' high.

Building Materials for Vault

- The support walls, floor, ceiling, and access door shall comply with the fire wall rating requirements of the local governing authority who has responsibility for approval of the building plans. The materials shall be substantially impervious to the passage of air or vapors.
- All exterior storm louvers shall be constructed of metal having adequate thickness and shall be rigidly anchored to the building floor, ceiling, and/or support walls. A 1/4" wire mesh, which covers the vault side of the entire louvered section(s), is required to prevent the entering of birds, litter, etc.
- When the meter vault is located **below grade**, it shall have a 3' x 6'8" self closing access door. The door shall open to the outside of the vault and have a seal that is substantially impervious to the passage of air or vapors. The clearance from the door to any source of ignition shall be as great as practicable. This clearance will be specified by the Company and shall not be less than 6'.
- The customer shall provide a cased opening in the foundation wall for the entrance of the Company gas service line. This shall be situated so that the gas service pipe enters directly into the gas meter vault and does not pass through other portions of the enclosure. The size and alignment of this opening will be determined by the Company. The Company will install a liquid - tight and gas - tight seal around the pipe where it enters through the provided opening.

Ventilation

- The ventilation system for the vault shall be unique and will be reviewed and approved by the Company. The ventilation system shall be an independent system serving only the vault, shall not be connected to any of the building heating, ventilation and air conditioning or exhaust systems, and shall be vented directly to the outside atmosphere. The intake and exhaust openings shall not be located less than 20' horizontally from any building ventilation or combustion air intake, nor less than 10' horizontally from any common building opening (door, window, crawl space vent, etc.). The opening shall be protected with exterior storm louvers which are designed to repel wind-driven snow and rain.

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- When the meter vault/meter room is located **above grade** (internal to the structure and adjacent to an external wall), ventilation of the vault shall be accomplished by gravity air flow. Ventilation air shall be provided by 2 openings connected directly to the outdoors, **each** having a net free area (opening area minus the area of the louvers, grating, and screen) of not less than 2.5% of the floor area of the vault. To achieve the most efficient use of air flow, one opening must be located near the floor and one opening located near the ceiling of the vault. The ventilation opening may be located in the access door.
- When the meter vault is located below grade, either internal or external to the structure, ventilation of the vault may be provided by several means. Following are two options:

1. Gravity Air Flow - Ventilation air shall be provided by 2 openings which terminate external to the structure by means of independent duct-work. The termination point (external to the structure) of both ducts shall be at a point which is a minimum of 3' above grade. Each duct shall have an exterior storm louver with a minimum net free cross-sectional area of 2.5% of the floor area of the vault. The duct-work from each opening to each storm louver shall also have a minimum cross-sectional area of 2.5% of the floor area of the vault. One of the openings shall be at the ceiling of the vault, and the other shall be within 12" of the floor of the vault.

2. Mechanical Exhaust - Additional vault space may be required for the duct and blower motor, and the customer shall provide the Company with complete specifications for the ventilation system. The customer shall install and maintain the ventilation system at no charge to the Company. Ventilation fans shall be equipped with explosion proof motors and non-sparking blades. All interior ducts on the discharge side of the fan shall be of welded construction. The forced air ventilation system shall be capable of providing 12 air changes per hour, and shall be designed such that a negative pressure exists in the vault.

Note: All associated duct-work installed outside of the vault shall be enclosed with 2 hour fire rating type construction. The structural strength of all vault associated duct-work shall conform to the standards set forth in the **National Fire Protection Association No. 91**, subsection - **Systems For The Removal Of Flammable Vapors**.

- If a vent line to the outside of the building is required for any pressure relief or pressure regulating device, the customer shall provide an opening or a passage in the structure for the vent line(s) as prescribed by the Company. The vent line(s) will be installed by the Company, or by special agreement, may be included during construction by the customer's builder

Drainage

All vaults shall be designed to minimize the entrance of water. If water leakage into the vault is anticipated, drainage must be provided and shall be in accordance with all applicable codes. The vault shall not be connected by means of a drain that is connected to any other underground structure, such as a sewer.

Electrical

An explosion proof lighting fixture and switch shall be installed and wired at the customer's expense. All electrical equipment and associated wiring contained in the vault shall conform to the standards set forth for Class 1, Group D of the National Electrical Code, ANSI/NFPA 70.

Customer's Piping

All customer owned fuel line piping installed in the vault shall comply in all respects to applicable local codes. The entrance of the customer's gas fuel line piping into the vault shall be sealed with liquid-tight and gas-tight seals and the location of this entrance shall be reviewed and approved by the Company. If the fuel line exits the vault directly into the structure, an approved shutoff valve shall be installed immediately outside the vault in the customer's piping. If the fuel line exits the vault underground (external to the structure), an approved shutoff valve shall be installed inside the vault in the customer's piping.

Meter Set Design

If possible, regulating and overprotection equipment should be chosen such that relief vent lines are not required. This can be accomplished with a monitor type set up that does not contain any relief valves, relief type regulators, or relief type pilot loaders.

Vault Access

The primary entrance to the vault shall not be through the ceiling of the vault and shall be located such that access is convenient for both equipment and personnel. A vault that is located below grade shall not be lower than one floor level below grade. On above grade vaults, the door shall open directly to the outside of the building, with no access to the vault from the interior of the building. The Company shall have access at all times for both equipment and personnel. The vault area will be kept clear of all extraneous equipment, and shall not be used for the storage of any material. A "**No Smoking**" sign will be located at the entrance to the vault.

Vault Construction, Ownership and Maintenance

The construction shall be such that any gaseous content within the vault is prevented from entering the customer's structure. The vault shall be built in accordance with all applicable codes. However, the Company reserves the right to require specifications more stringent than the applicable codes, if necessary.

The customer shall retain ownership of the vault and all associated equipment other than the Company piping and equipment. The customer shall maintain and repair all damage done to the vault structure, grating, louvers, wire mesh, door lighting equipment, and ventilation equipment. The customer will be responsible for preventing water leakage into and/or water accumulation within the vault, and to prevent freeze-up of the drainage system, installed.

The gas meter will be installed and gas service established only after the completion of an acceptable inspection by the Company Engineer (or representative) who is assigned to the

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project. However, the following items must be completed before such inspection (and the subsequent service installation) occurs:

- The ventilation system shall be installed and operational.
- All liquid-tight and gas-tight seals shall be installed where required.
- The customer's fuel line shall be installed where previously designated by the Company. The meter will not be set until the fuel line is approved by the authority having jurisdiction.
- The permanent door and lock shall be installed and operational, and a key provided to Xcel Energy, if required.
- The drain system shall be installed and operational, if required.
- The vault lighting equipment shall be installed and operational.

An Easement and Covenant prepared by the Company shall be signed by the owner or designated agent and returned. This document will be recorded by the Company with the appropriate County Clerk and Recorder.

An agreement to build the vault according these vault specifications shall be signed and returned to the Company. An additional statement shall be signed and returned to the Company designating the vault as an Xcel Energy Gas Meter Vault with a copy of the statement sent to the applicable City and/or County agency.