

Subject: Advance Services

Topic: LPG and Bio Gas Installation

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LPG & BIO GAS INSTALLATION

INTRODUCTION

In this topic we are going to learn about the two gases which are used in the household and commercial purposes:

- **Biogas**

- *Biogas plant*
- *Types of biogas plant*
- *Locations*

- **LPG**

- *Source*
- *Equipment*
- *Location of equipment*

And how the same are transferred to the desired location and the requirements needed to be fulfilled to do the same.

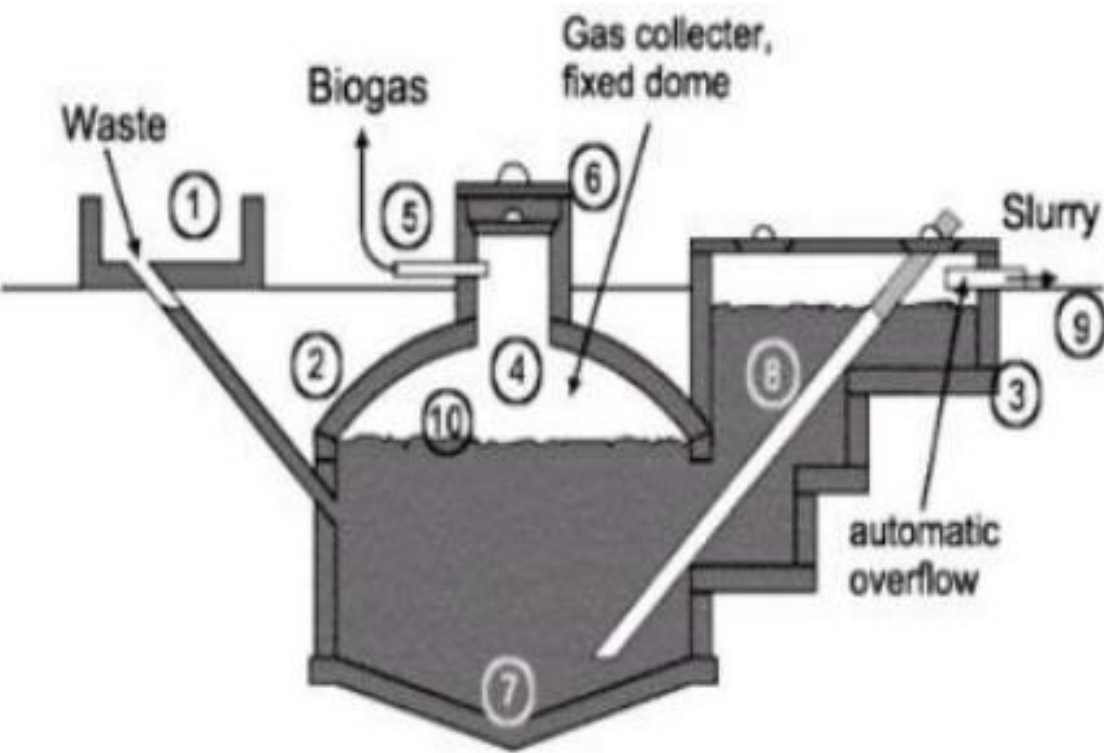
BIOGAS

Now the biogas is a naturally produced gas from organic materials like dung, stale food etc. The gas requires a biogas plant to be produced. Biogas plant is either connected to a rubber pipe or a steel pipe (as in PNG) to carry gas to desired place.

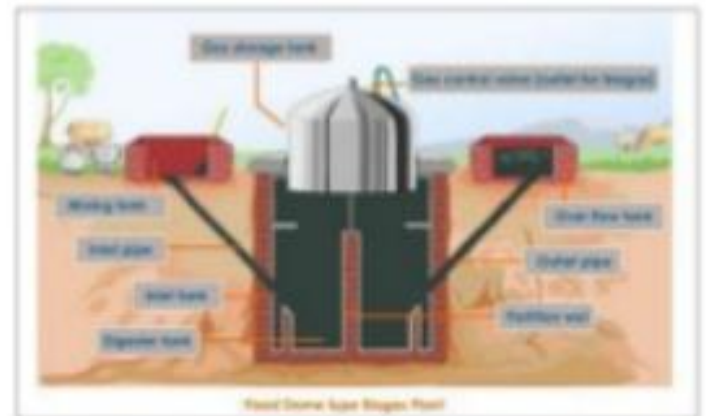
The plant are of 3 types:

- **Fixed dome:** This type is made up of bricks, cement mortar, concrete (30mm aggregate). All slabs are of 10 cm thickness.
- **Floating drum:** The top part of the plant is a steel drum placed over the well. It delivers a constant gas pressure.
- **Plastic covered ditch:** This is the small version of the floating drum and is made up of plastic. It doesn't requires a well to be dug.

The biogas plant is always kept outside at the rear end of the premises. It should be away from the traffic areas.



Fixed Dome plant (Typical work cycle of Biogas Plant)



Floating drum plant



Plastic covered ditch

LIQUIFIED PETROLEUM GAS (L.P.G.)

As we all know, this fuel is drawn from some of the oil/ gas reservoirs, and is transferred to the usage areas by following method:

- **Through cylinders** : This is the common way we know how to transfer the gas. Either a separate cylinder is issued or a common is issued and connected to the consuming apparatus. The cylinders are kept outside at the rear end of house if having fixed pipeline.
- **PNG** : In **Pipe Natural Gas**, the gas is transferred through pipes under and along the roads from source to destination. This type always has a meter connected to the line to record the consumption.



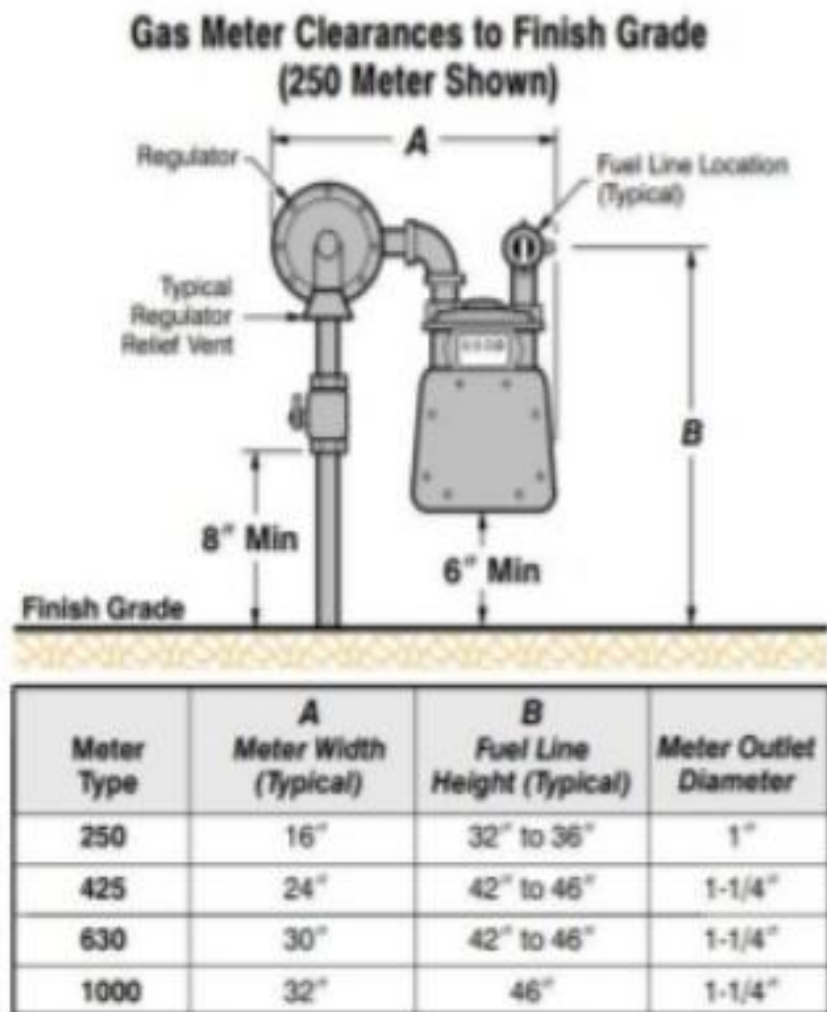
Cylinder supply



PNG

PARTS OF PNG:

- **Workpit:** Area where joints with main line and meter are made. 2 Workpits at least are required everytime.
- **Meter:** Device used to record consumed amount of gas. Always located outside the house on front-side walls or either on front wall.
- **Regulator:** Regulates the pressure in the line.
- **Fuel Line:** The line that goes from meter to inside.
- **Valve:** Just like any other valve to stop the flow of gas.

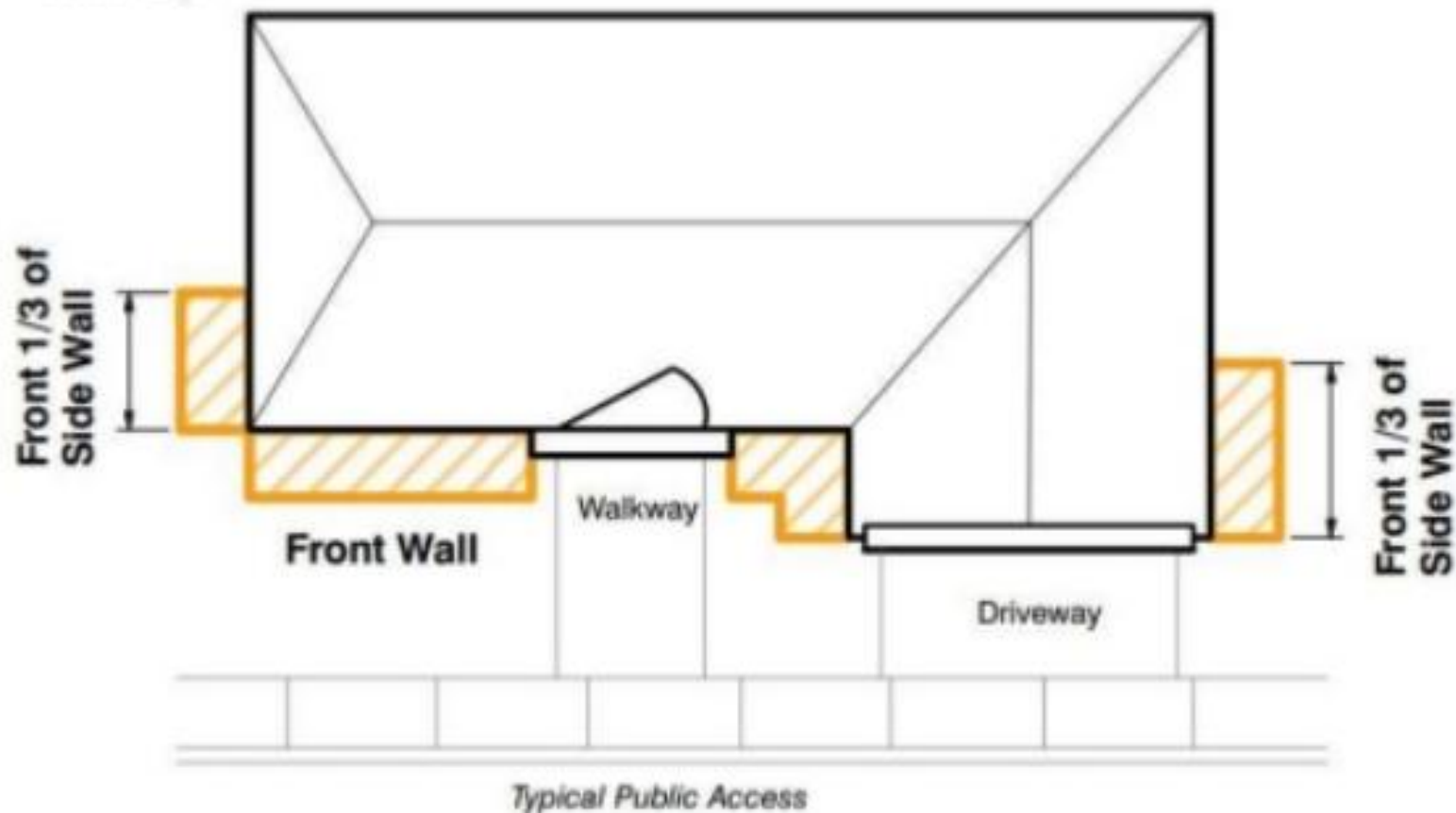


A person wearing a bright red long-sleeved shirt is shown from the side, working on a wall-mounted utility meter. The meter is a dark, cylindrical device with various pipes and connections. The person's hands are positioned near the meter, suggesting they are performing maintenance or installation. The background is a plain, light-colored wall. The entire image is framed by a thick black border.

LOCATION OF METER

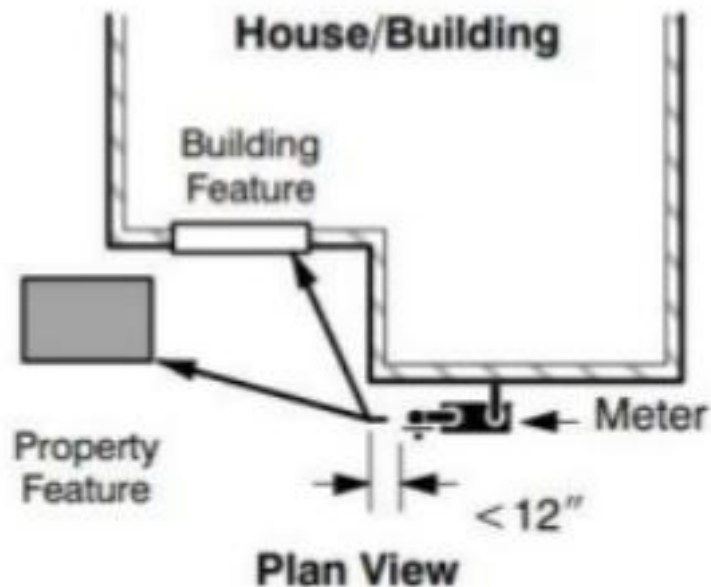
Locate gas meter on the **front wall**, or **within the front 1/3 of the side wall**, observing the corner clearance requirements detailed below.

The area 3 feet in front of and 2 feet to either side of the meter set assembly must be free of any landscaping (bushes, fences, etc.) and other structures that restrict access to the meter set assembly.



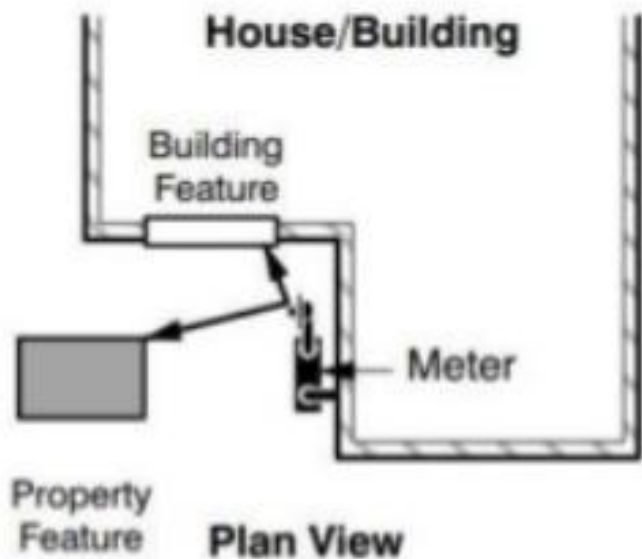
Outside Corners

- ◆ The regulator relief vent (see diagram above) should be at least 12" from any outside corner.
- If the regulator relief vent is at least 12" from any outside corner, then there are no minimum clearances to features around the corner.
- If the regulator relief vent is less than 12" from any outside corner, then the minimum clearances specified in this handout must be maintained.
Measure as if using a string.



Inside Corners

- ◆ Clearance distances from the regulator relief vent or meter set assembly to the feature must be maintained in accordance with this handout. *Measure as if using a string.*

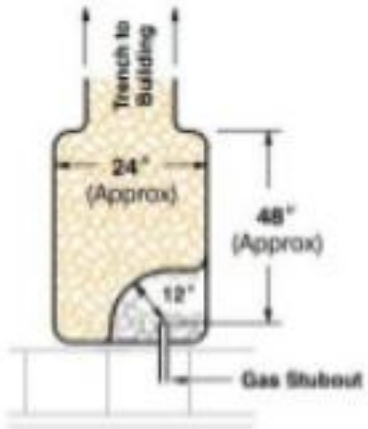




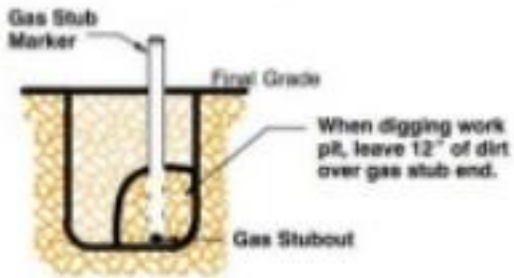
Backfill Requirements for Direct-Buried Installations

- ◆ **Final Backfill For Direct Bury:** The backfill layer above the sand shading shall be soil that is free from construction debris, glass, sharp rocks, frozen clods, and rocks larger than 8" in diameter.
 - ☐ If the final layer contains rocks larger than 8" in diameter, then 12" of shading shall be placed over the gas service.
 - ☐ Rocks larger than 10" in diameter are **not** permitted in the final backfill.
- ◆ **Sand Bedding:** The customer shall provide and install clean sand to a depth of 4 inches prior to gas service pipe installation. See diagram at left.
- ◆ **Sand Shading:** The customer shall provide additional clean sand in piles that are readily accessible near the trench. This shading sand is to be installed by the PSE crew after direct-buried gas line installation. Enough sand shall be provided so that the installation can be covered to a depth of 6 inches. See diagram at left.
- ◆ If customer-owned facilities will be included in the trench, please contact PSE or local power company directly for clearance requirements.

Work Pit Dimensions

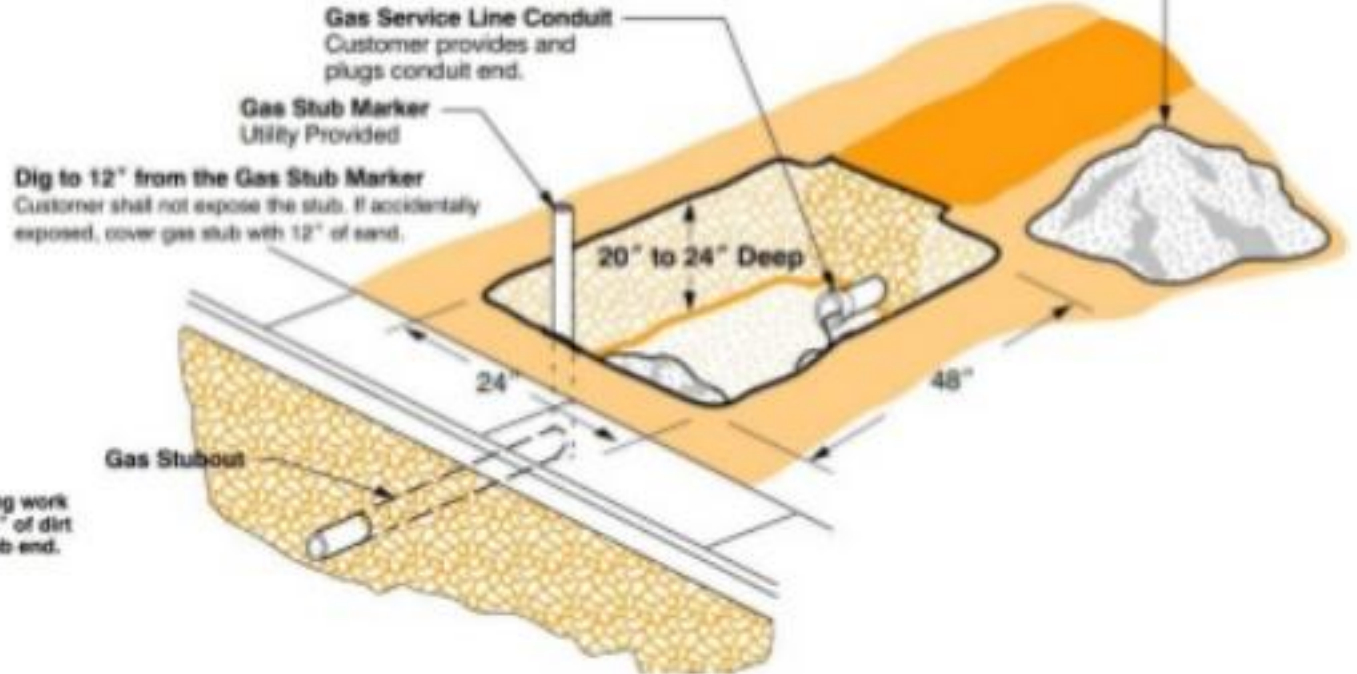


Work Pit Cross-Section

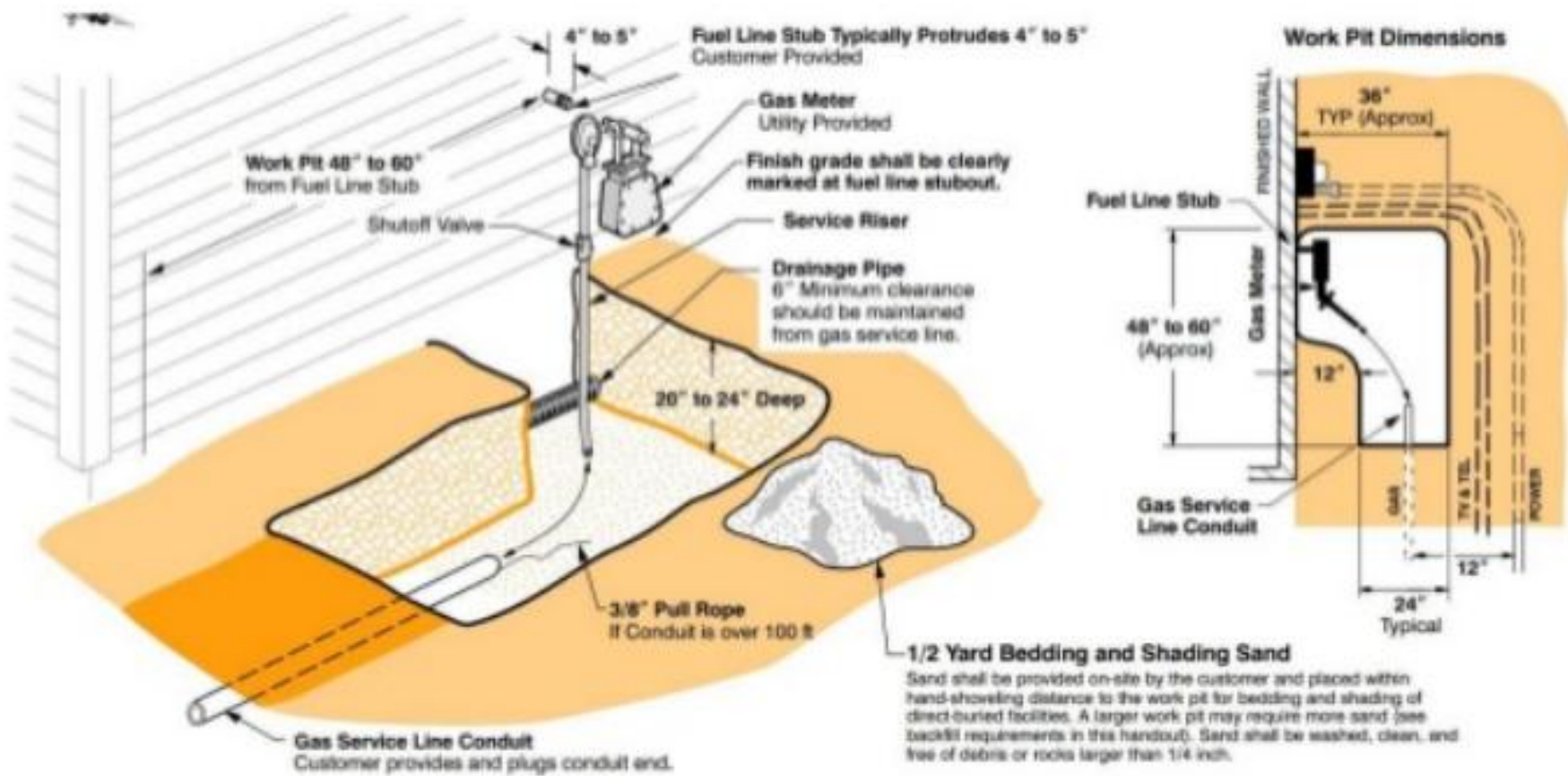


1/2 Yard Bedding and Shading Sand

Sand shall be provided on-site by the customer and placed within hand-shoveling distance to the work pit for bedding and shading of direct-buried facilities. A larger work pit may require more sand (see backfill requirements in this handout). Sand shall be washed, clean, and free of debris or rocks larger than 1/4 inch.

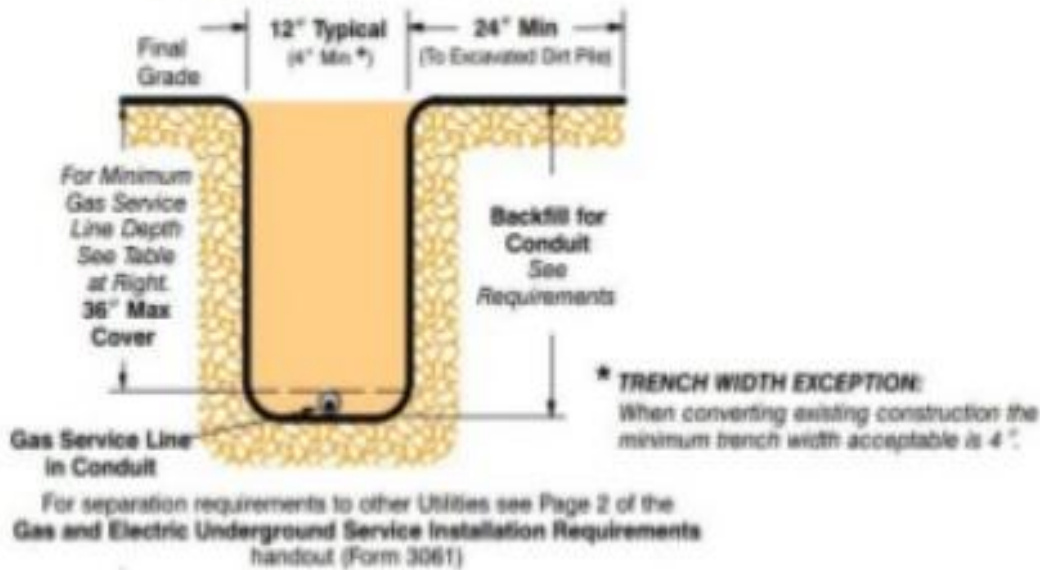


Main Line Workpit

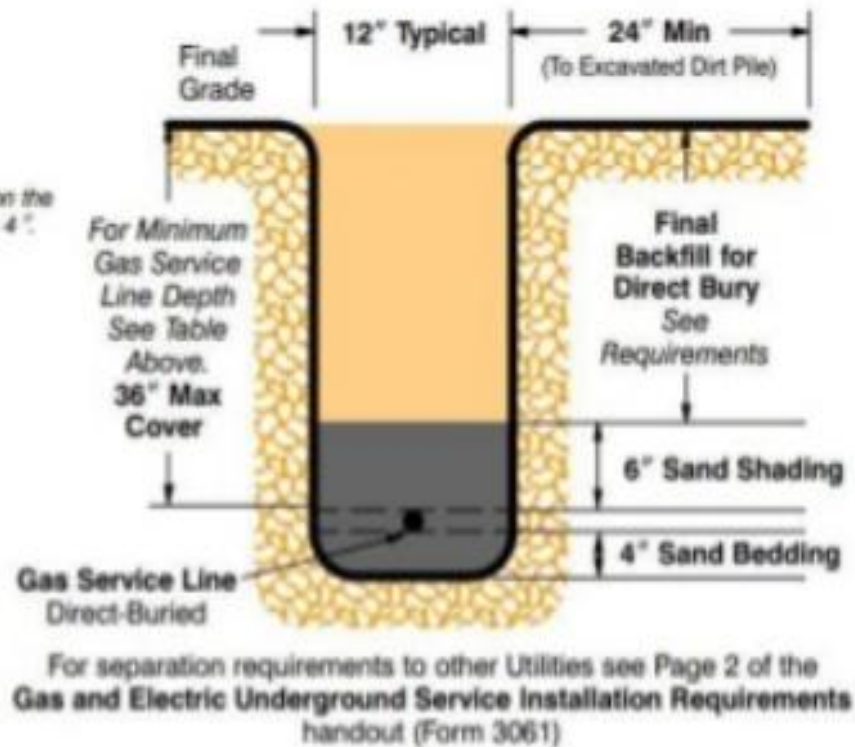


Meter Workpit

Gas Service Line in Conduit Installation



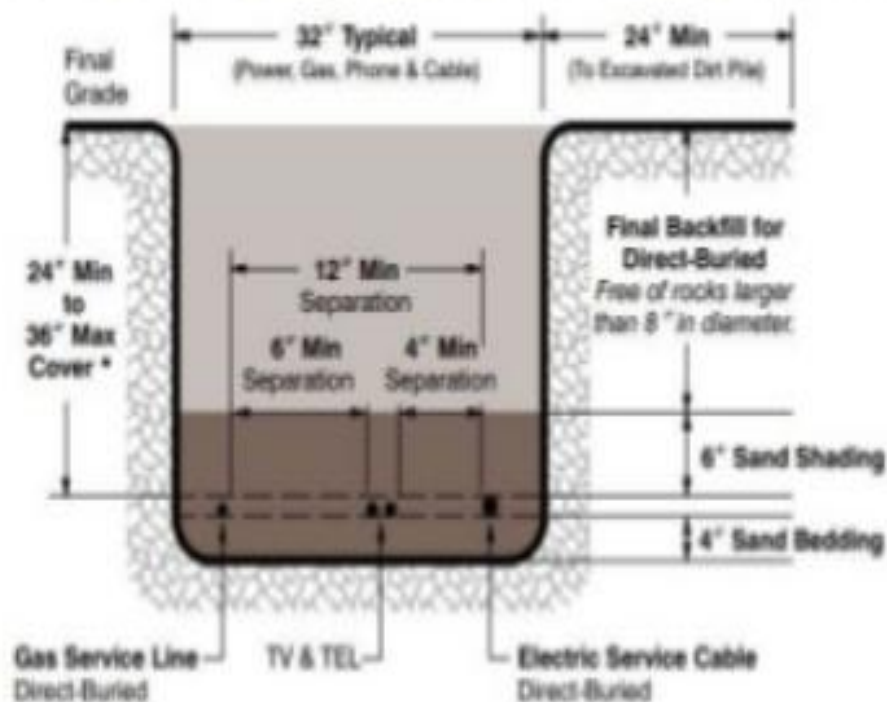
Gas Service Line Direct-Buried Installation



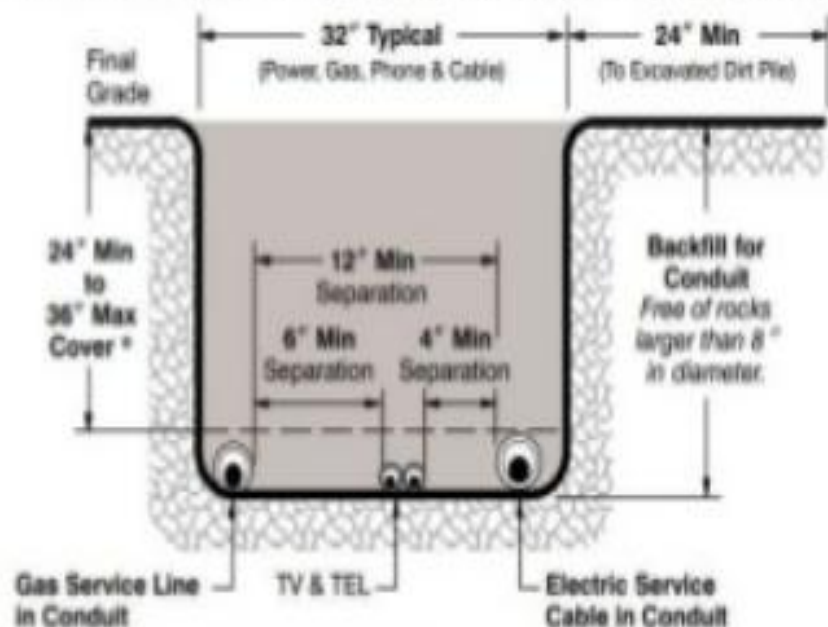
Gas Service Line Depth Table for Conduit and Direct-Buried Installations

Gas Service Type	Gas Service Pipe Size	Minimum Depth of Cover over Gas
Residential	Any Size	18"
Commercial/Industrial	1-1/4" +	24"
Any Service in Snow Country (See Form 3736)	Any Size	24"

Joint Service Line Trench Direct-Buried Installation



Joint Service Line Trench Conduit Installation



Separation Requirements to Other Utilities for Conduit and Direct-Buried Installations

Installation	Horizontal Separation			Vertical Separation when Crossing		
	Gas to Electric	Gas to TV/Tel	Electric to TV/Tel	Gas to Electric	Gas to TV/Tel	Electric to TV/Tel
Conduit	12" minimum	6" minimum	4" minimum †	6" minimum	6" minimum	4" minimum †
Direct-Buried	12" minimum	12" minimum	4" minimum †	12" minimum	6" minimum	4" minimum †