Purpose and Scope

This document provides the criteria for selecting the appropriate type of underground transformer: pad-mount, subsurface, or vault.

General Information

1 Underground Transformer Types

Underground transformers are available in three types:

1. **Pad-Mount**: The transformer is mounted on a pad at ground level and is operated while standing in front of open door.

2. **Subsurface**: The transformer is placed in an enclosure with a removable top and is operated while standing at ground level alongside the open enclosure. This also may be called “surface-operable.”

3. **Vault**: The transformer is placed inside a concrete vault and is accessed by climbing down through a manhole directly from the street. It is operated while standing alongside the equipment inside the vault.

2 Standard Equipment Types

PG&E’s normal and preferred installation for new construction and for reconstruction in underground areas is using pad-mounted transformers, which offer the following advantages:

1. Less costly to install.

2. Less costly to maintain.

3. Easier to inspect.

4. Lower failure rates.

5. Easier to locate and operate, which translates into lower outage times.

6. No water to pump out, eliminating disposal concerns.

7. Safer to operate and maintain in a more open space vs. a more confining space.

Subsurface and vault installations do not have the advantages that pad-mounted transformers have. Vaults also have the added disadvantage of the special requirements for operating in a confined space.
3 New Business – R15 and R16 and Work Request by Others (WRO)

Rule 15 and 16 new business applicants for service are required to provide the necessary space on their project for PG&E’s required pad-mount facilities. See the Commercial/Industrial section or the Residential section below for the preferred locations.

Applicants for new business and customer reconstruction projects may request that subsurface facilities be installed in lieu of pad-mount for aesthetic reason or when adequate appropriate space is not available. If feasible and approved by PG&E, these installations are handled as a non-preferred installation subject to Rule 2 special facility charges. Subsurface then may be installed provided the requirements for allowing the installation of subsurface transformers are met as detailed in Document 072149.

4 Reconstruction – Rule 20A

Pad-mount is PG&E’s standard for all installations, including Rule 20A work. When it has been determined that subsurface facilities must be installed, follow the same procedures as used in Rule 15 and 16 new business work. For a Rule 20A project, after all possibilities of pad-mounted transformers have been exhausted, determination may be made that subsurface transformers must be used as the only option. Follow established Rule 20A procedures when making this determination.

5 Reconstruction and Other PG&E-Driven Work

For new installations the standard transformer type is pad-mounted.

Should physical space not allow the installation of pad-mount, consideration should first be given to rearrangement to allow pad-mount before installing subsurface transformers.

For replacements of subsurface transformers, if corrosion is involved in transformer failure and the transformer life is 15 years or less, the replacement transformers should be pad-mount whenever feasible.

6 Vault Transformer

Vault installations create difficult work requirements and are extremely expensive. They may only be used when there is no physical space for pad-mounts and where the required subsurface transformer is not available. For normal applications this will only occur in the network areas of downtown San Francisco and Oakland.

7 Transformer Location – General

1. A transformer providing more than one service shall be in an area covered by franchise, easement, or right-of-way.

2. A transformer serving only a single customer should normally be placed on the customer’s property.

3. Preferred subsurface transformer locations, from most preferred to least preferred, are:
   A Customer property side of the sidewalk.
   B Planted area between the curb and sidewalk.
   C In the sidewalk.
   D In the paved portion of a parking lot.
   E In the parking area of a street.
   F In the traffic portion of a street.
8 Commercial/Industrial
The preferred locations for transformers serving industrial and commercial loads are shown in order of preference:

**Figure 1**
Commercial – Preferred Location 1
Outside on Concrete Pad – Most Preferred

**Figure 2**
Commercial – Preferred Location 2
Underground Accessible from Adjacent Building
8 Commercial/Industrial (continued)

Figure 3
Commercial – Preferred Location 3
Inside the Building

Figure 4
Commercial – Preferred Location 4
Underground Exterior to Building – Least Preferred

See Document 057521 for Room Requirements
9 Residential

The preferred locations for transformers serving Residential loads are shown in order of preference:

Figure 5
Residential – Preferred Location 1
Pad-Mount in street Franchise Area

Figure 6
Residential – Least Preferred Location 2
Subsurface in Street Franchise Area

References

Location Document

Pad-Mounted Transformer Installed Indoors UG-1: Transformers/Greenbook/EMWP 057521
Primary Electric Underground Equipment Enclosures UG-1: Enclosures 062000
Requirements for Allowing Installation of Subsurface Transformers UG-1: General/Greenbook 072149

Revision Notes

Revision 00 has the following changes:

1. This is a new document.