



# Customer Requirements Switchgear Vault Installation

**C-UG-1600**

## Application

Installation requirements of precast concrete switchgear vaults and associated conduit installations. All excavation work required by this standard shall conform to the safety requirements of WAC 296-155 Part N (Excavation, Trenching, and Shoring) and any other applicable regulations.

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## Terms

Term	Definition
Construction Inspector	Representative from Tacoma Power T&D Construction Staff. <b>A pre-construction meeting with the Construction Inspector must happen prior to any construction. Call 253-381-3023.</b>
Tacoma Power Engineer	Tacoma Power engineering staff that provide design, cost estimates, and coordination of the commercial project.

## Inspection Requirements

**The Construction Inspector will inspect all electrical contractor construction of switchgear vaults and associated conduit installations.**

## Vault and Cover Requirements

The **Tacoma Power Engineer** will determine the type of vault and cover (see table below) to be installed depending on location.

Precast Concrete Vault and Cover	MID #
• 810 Base, Lower Section, 8'-8" x 10'-8" x 6'-8"	60564
• 810 Cover, standard, 8'-8" x 10'-8" x 1'-6"	63354
• 810 Cover, nonskid, 8'-8" x 10'-8" x 1'-6"	60566

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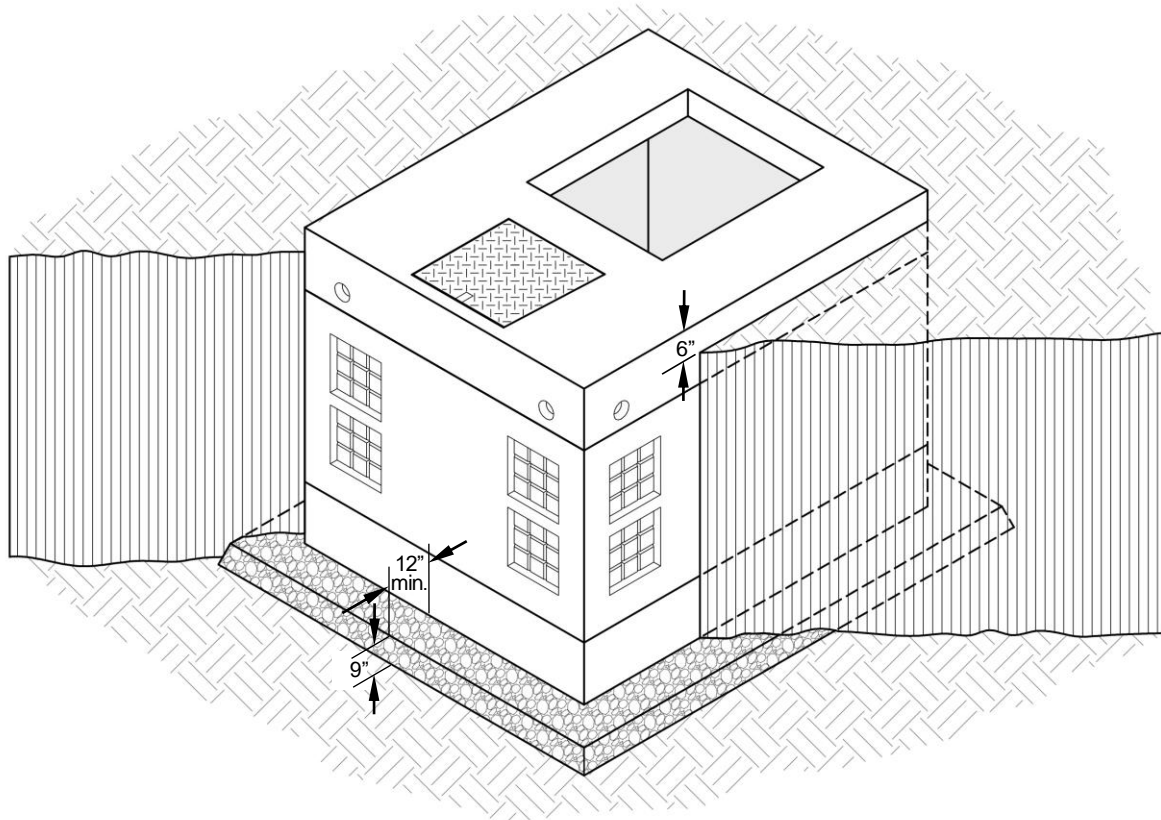
## Installation of Vault and Cover

### Foundation and Backfill for Vault

The foundation shall be prepared as follows, as directed by the **Construction Inspector**. See Figures 1 and 2.

Issue	Action
<b>Excavation for Vault</b>	The <b>Construction Inspector</b> will direct the excavation requirements.
<b>Vault Foundation</b>	Vault foundation shall be minimum of 9 in. of 5/8 in. minus crushed rock, well compacted, extending a minimum of 12 in. beyond the edge of the vault in all directions.
<b>Backfill Material</b>	Clean fill or better as directed by the <b>Construction Inspector</b> .
<b>Compaction at Subgrade</b>	Compaction requirements will be determined by the <b>Construction Inspector</b> .
<b>Final Grade</b>	The elevation difference between the top of the vault and cover with final grade shall be 6 in.

**Figure 1** Switchgear Vault Foundation and Backfill



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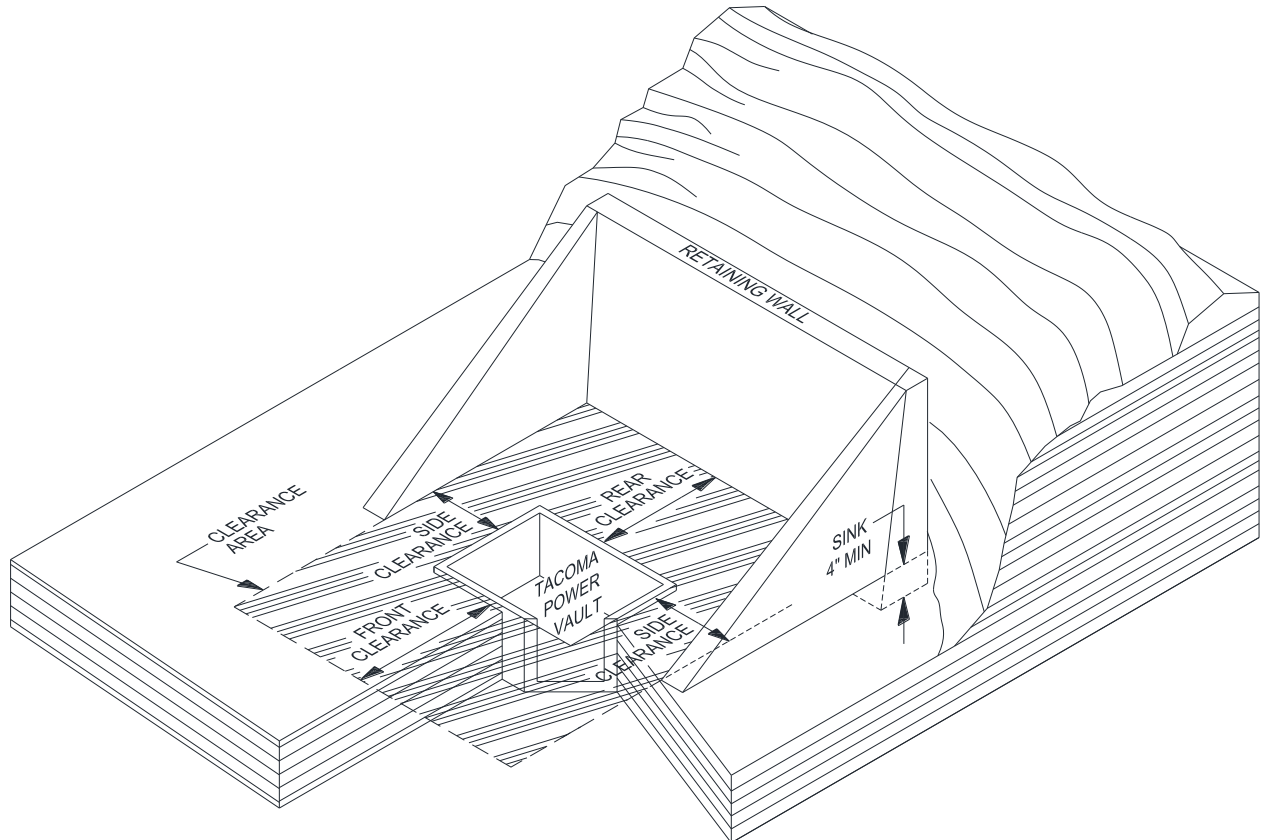
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## Installation of Vault and Cover (continued)

**Figure 2** Sloping Installations

For switchgear vaults installed on a slope, the *minimum* dimensions for clearances are:

- Front clearance = **10 ft.**
- Rear clearance = **10 ft.**
- Side clearance = **6 ft.**



### Construction Notes

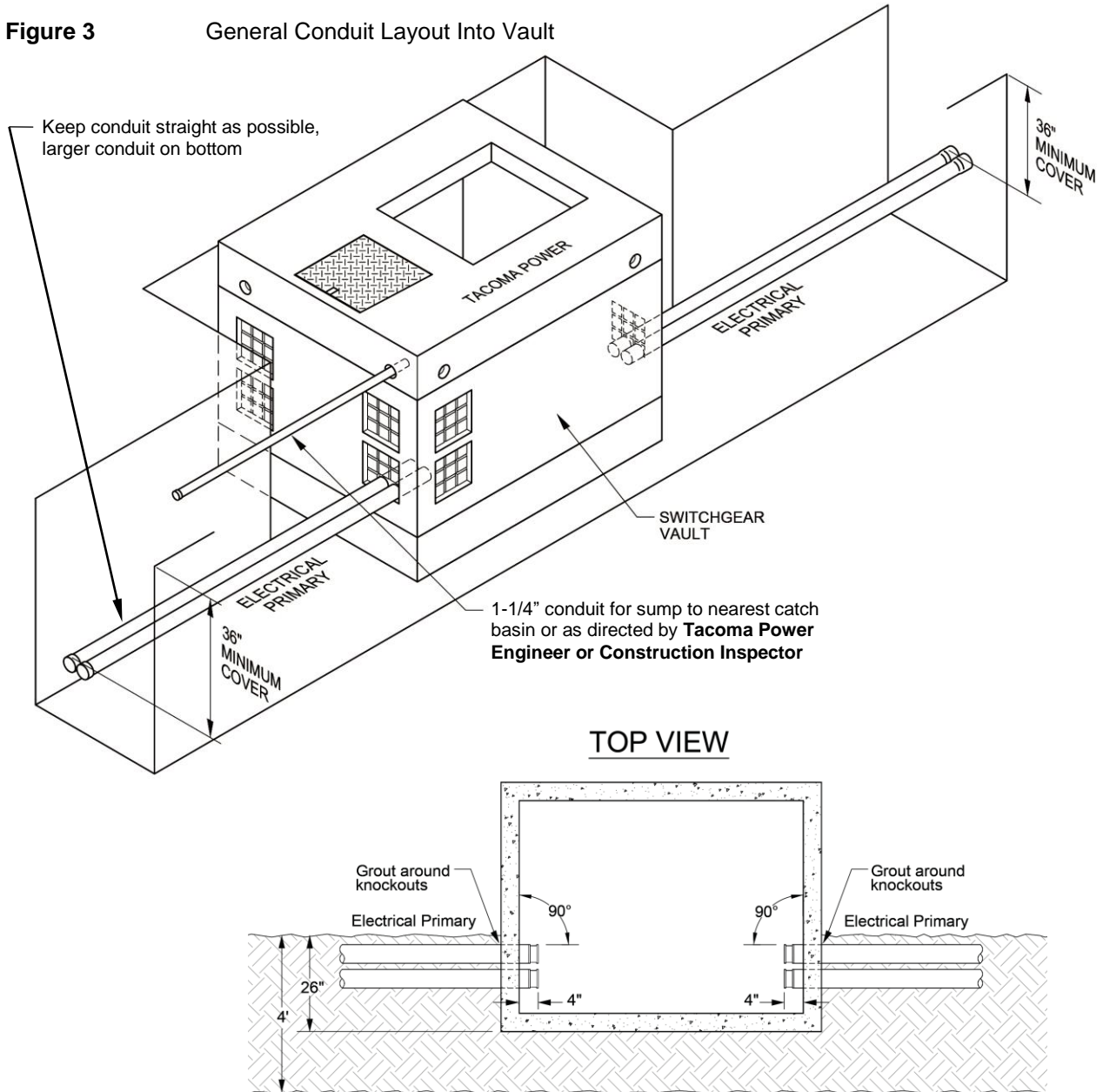
- **The vault should be installed approximately 26 in. into the trench so that conduit entering the vault will not have any bends (see Figure 3).**
- The switchgear vault must be kept clear of any **obstructions**, such as:
  - fences, mail boxes, rockeries, berms, and vegetation.
  - bark, sod, ground cover mulch, and rocks, etc., on any part of the structure.
  - trees and bushes extending into the clearance area.
- The clearance area grade shall be level and a retaining wall shall be provided when required by the **Tacoma Power Engineer**.
  - A wooden, concrete or rockery wall shall have 1 to 4 maximum allowable slope to the property line.

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## Installation of Conduit

**Figure 3** General Conduit Layout Into Vault



### Trench

The depth of trench and backfill for primary conduit is listed below:

Issue	Action
Depth	A minimum of 36 in. of cover is required over the primary conduit. With prior approval, exceptions may be granted by the <b>Tacoma Power Engineer</b> .
Backfill	The trench shall be backfilled with clean fill or better as directed by the <b>Construction Inspector</b> .

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## Installation of Conduit *(continued)*

**Conduit Size & Type** The conduit shall be installed per the requirements listed below unless otherwise directed by the **Tacoma Power Engineer**:

Cable/Purpose	Conduit
2 x 350 kcmil Primary	2 x 6 in.
750 kcmil Primary	6 in.
3Ø – #2 or 1/0 kcmil Primary (URD)	4 in.
1Ø – #2 Cu Primary (URD)	2-1/2 in.
600V Secondary for Sump Pump Service	2-1/2 in.
Conduit Drain for Sump Pump	1-1/4 in.
Color and Minimum Grade of Acceptable Conduit	Gray, Sch. 40 PVC

### Conduit Entry

- Conduit entering the vault shall be placed to allow a “full wrap” of cable in the vault before termination. The **Construction Inspector** may approve exceptions on a site-by-site basis only.
- Install feeder (600A) conduit thru the lower knockouts and URD (200A) conduit thru the upper knockouts.

### Conduit Terminations

Conduit shall be terminated as detailed below:

Issue	Action
Termination of Conduit <b><i>Inside</i></b> the Vault	<p>The conduit into the switchgear vault shall:</p> <ul style="list-style-type: none"> <li>• be perpendicular to the vault wall.</li> <li>• extend 4 in. into the vault.</li> <li>• have bell ends on the conduit ends. Do not glue bell ends.</li> <li>• be sealed into the vault with grout around the knockouts.</li> </ul>
Termination of Conduit “stubs” <b><i>Beyond</i></b> the Vault (when required)	<p>The conduit ends shall:</p> <ul style="list-style-type: none"> <li>• be terminated 5 ft. minimum beyond the vault.</li> <li>• install conduit coupling and cap prior to backfill in order to prevent the backfill material from entering the conduit.</li> <li>• be marked with a length of 2.5 in. Sch. 40 PVC conduit extending vertically a minimum of 4 ft. above grade with a “<i>Call Before You Dig</i>” sticker.</li> </ul>