
	<b>BOX-PAD FOR PAD-MOUNTED TRANSFORMERS</b>		<b>064309</b>
	<b>Asset Type:</b> Distribution		<b>Function:</b> Design
<b>Issued by:</b> Michael Thibault (MLTC)		<b>Date:</b> 12-01-19	
<b>Rev. #10:</b> This document replaces PG&E Document 064309, Rev. #09. For a description of the changes, see Page 7.			

**This document is also included in the following manual:**

- [Electric and Gas Service Requirements Manual](#) (Greenbook)

**Purpose and Scope**

This document shows the requirements for the box-pad used with single-phase Style DF (see [Document 064307](#)), duplex, and three-phase Style MTP (see [Document 045290](#)) transformers. This document applies to both radial and looped primary circuit arrangements.

**Applicant Notes**

1. Prior to setting a pad, the applicant will request an inspection by PG&E. PG&E shall determine the acceptability of each pad installation. The pad installation includes two ground rods and the interconnecting ground wire.
2. If required, the applicant shall provide suitable barriers for the protection of the transformer (refer to [Document 051122](#)).
3. The pads must be made by a PG&E-approved supplier. The approved suppliers are listed in [Document 066211](#).

**Fabrication Requirements**

4. Box-pads are designed to fully encompass the transformer, including any radiators. Each pad shall hold the full kVA range of the indicated style. The pad dimensions are based on the allowed transformer dimensions shown in [Document 064307](#).
5. The pads shall be permanently identified with manufacturer's name, month and year of fabrication, nominal weight, and PG&E code number in the area indicated in Figure 1 on Page 4.
6. The pads shall conform to [Engineering Material Specification 21 "Box-Pad Style Transformer Pads"](#)
7. The pads shall be designed to support transformers weighing 3,000 pounds.
8. Two 1/2"-13 UNC inserts for securing the transformer cabinet shall be provided as indicated. One 5/8"-11 UNC insert shall be provided at the center of gravity for lifting the pad.
9. The inserts shall be installed flush with the surface of the pad.
10. The edges shall be rounded. Refer to [Engineering Material Specification 21 "Box-Pad Style Transformer Pads"](#)
11. The corners may be rounded. Refer to [Engineering Material Specification 21 "Box-Pad Style Transformer Pads"](#).

**Installation Requirements**

12. The transformer pad shall be placed on a firm 10-inch rock base, on top of native or engineered fill material, which has been compacted to at least the requirements of Note 15 on Page 2.
13. The area under the pad shall be excavated to the required grade, or to a depth necessary to reach firm, undisturbed material, whichever is deeper. The material may be considered firm if it cannot be penetrated by thumb except with moderate effort.
14. If firm material has not been reached within a depth of 3 feet, excavate 3 feet beyond the perimeter of the pad, and backfill the entire excavated area to the required grade and to the requirements of Note 15 on Page 2.

15. In case it is necessary to excavate deeper than the required grade to reach firm material, backfill to the required grade in one of the following ways:
  - A. Backfill with clean, non-expansive soil compacted to 90% of maximum density. The soil shall be placed in layers not more than 8 inches thick before compaction. Determine the maximum density and the in-place density by the [California Test Method No. 216-6, Parts I and II](#) respectively, or by [ASTM D-1556](#) and [D-1557](#) respectively. A copy of the test results may be required by PG&E.
  - B. Backfill with soil or cement slurry consisting of one sack of Portland cement per cubic yard and clean native soil or sand.
16. In areas of known soft soil conditions, trenches within the pad excavation area for the installation of conduits shall be backfilled in one of the ways specified in Note 15.
17. In addition to the above requirements, the pads shall be placed on a 10-inch level rock base to provide uniform bearing.
18. A minimum distance of 6 feet shall be maintained between the ground rods.
19. In general, all equipment pads should be installed as level as practicable. Pads supporting oil-filled equipment must be leveled to within 1 inch in 8 feet in all directions.
20. An equipment BOX pad SHALL NOT be placed on an elevated berm, mound or structure either earthen or otherwise when placed in a Flood Plain. If local knowledge of the area in which the equipment is to be placed identifies a high likelihood that uninsulated terminals of the equipment will come in contact with floodwater and the location cannot be moved to a location less likely to have flood levels come in contact with the exposed terminals, a Subsurface Fully Insulated Device should be installed in lieu of the pad mount design. In some cases such as transformers, because of capacity limits of subsurface material coded equipment it may not be possible to provide a transformer of sufficient capacity to serve loads in excess of the capabilities of a 1000 kVA UCD.

**Installation Procedure**

- Step 1. Excavate as required.
- Step 2. Install the exterior ground rod and run the ground wire to the pad excavation.
- Step 3. Place the primary conduit bends into the pad excavation.
- Step 4. Place the secondary and the service conduit into the pad excavation.
- Step 5. Compact and install the rock base. See "Installation Requirements", Notes 15, 16, and 17.
- Step 6. The exposed ends of the conduit bends should be about 1 inch above the gravel base.
- Step 7. Install end bell fittings.
- Step 8. Temporarily cap or plug all the conduits.
- Step 9. Route the ground wire through the pad opening.
- Step 10. Place the box-pad and backfill to the appropriate level for the pad.
- Step 11. Install the interior ground rod.

**Table 1 Bill of Materials**

Item	Quantity	Description	Code
1	1	Box-Pad, (as required – see Table 2 on Page 4)	-
2	As Req'd.	Wire, #2 AWG, Solid Bare Copper	290074
3	2	Ground Rod, 5/8" x 8'-0", Copperclad (see <a href="#">Document 013109</a> )	187013
4	2	Clamp, Ground Rod, (see <a href="#">Document 013109</a> )	187012
5	As Req'd.	Compacted Backfill	-
6	As Req'd.	Rock Base (compact 3/4" minus the rock base)	-

**Box-Pad For Pad-Mounted Transformers**

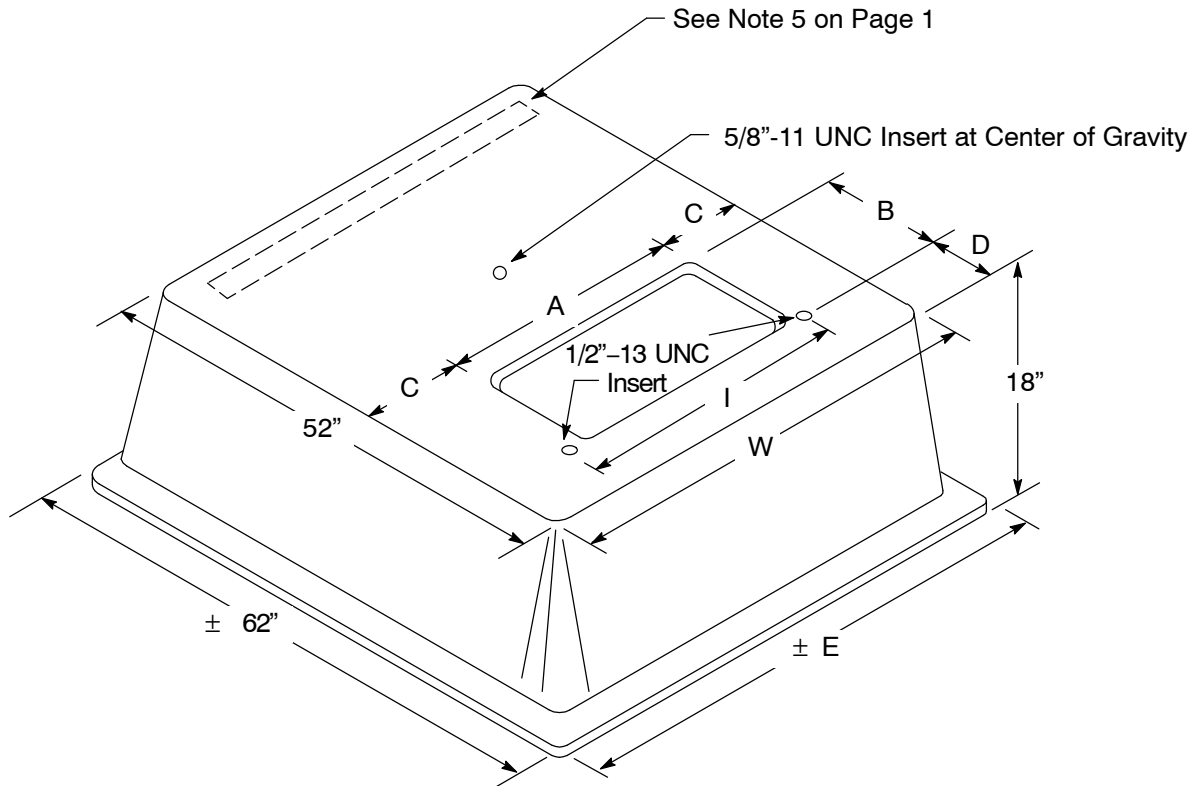
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<b>References</b>	<b>Location</b>	<b>Document</b>
<a href="#"><u>Corrosion Resistant Ground Rods and Ground Rod Clamps</u></a> .....	<a href="#"><u>UG-1: Connectors/Greenbook</u></a> .....	<a href="#"><u>013109</u></a>
<a href="#"><u>Loop-Style, Three-Phase, Pad Mounted Transformers Location, Clearances, and Mechanical Protection</u></a> .....	<a href="#"><u>UG-1: Transformers</u></a> .....	<a href="#"><u>045290</u></a>
<a href="#"><u>Details for Pad-Mounted and Subsurface Equipment</u></a> .....	<a href="#"><u>UG-1: General</u></a> .....	<a href="#"><u>051122</u></a>
<a href="#"><u>Single-Phase, Dead-Front, and Duplex, Pad-Mounted Transformer</u></a> .....	<a href="#"><u>UG-1: Transformers</u></a> .....	<a href="#"><u>064307</u></a>
<a href="#"><u>Single-Phase, Dead-Front, and Duplex, Pad-Mounted Transformer Installations</u></a> .....	<a href="#"><u>UG-1: Transformers</u></a> .....	<a href="#"><u>064308</u></a>
<a href="#"><u>PG&amp;E-Approved Electric Distribution Materials Manufacturer</u></a> .....	<a href="#"><u>Greenbook</u></a> .....	<a href="#"><u>066211</u></a>
<a href="#"><u>Engineering Material Specification No. 21 "Box-Pad Style Transformer Pads"</u></a> .....	<a href="#"><u>TIL</u></a> .....	<a href="#"><u>EMS21</u></a>

**Box-pads**

**Table 2 Dimensions for Pad-Box**

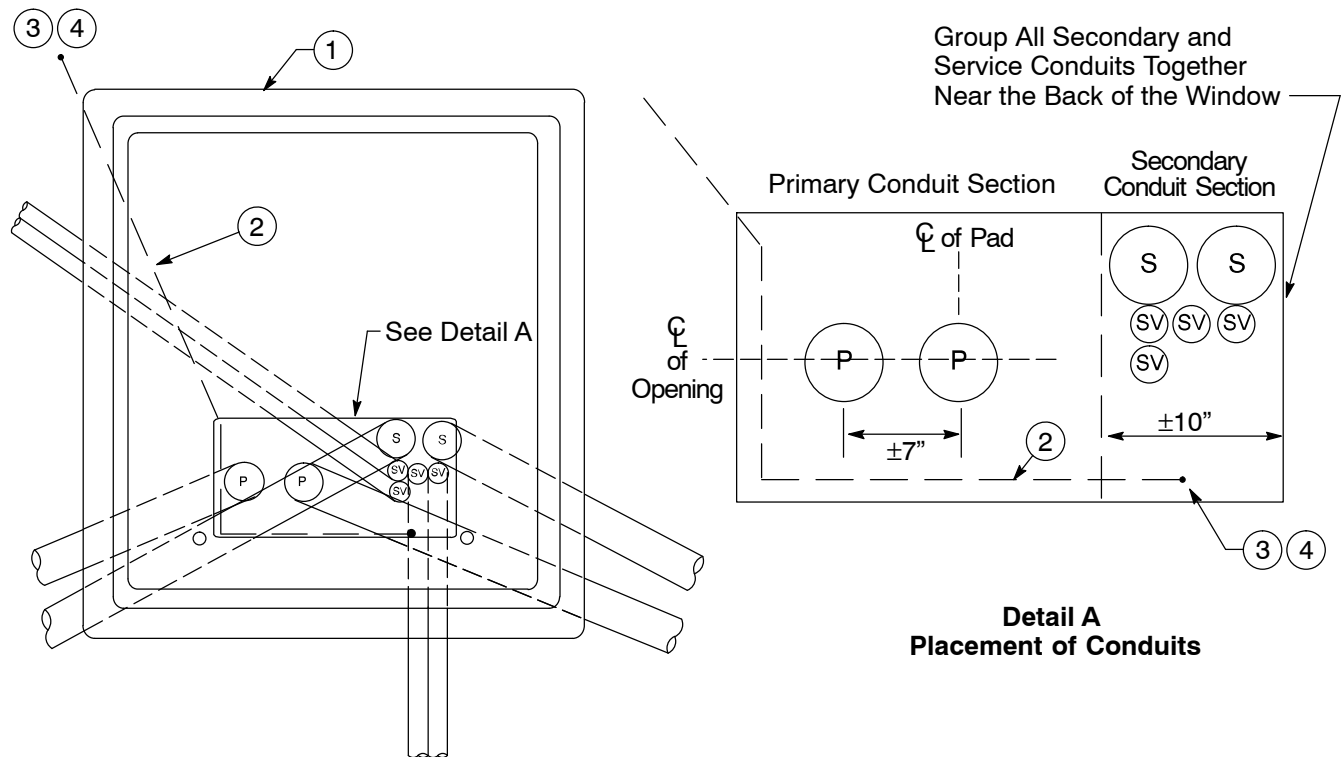
Transformer	Pad Code Number	Dimension in Inches						
		A	B	C	D	E	I	W
1-Wire, 2-Bushing Style DF-LB	360001	25	15	5.5	4	46	28	36
2-Wire, 4-Bushing Style DF-LB	360002	28	15	11	4	60	31	50
3-Wire, 6-Bushing Style DF-LB, Duplex and Style MTP	360003	37	15	6.5	4	60	40	50



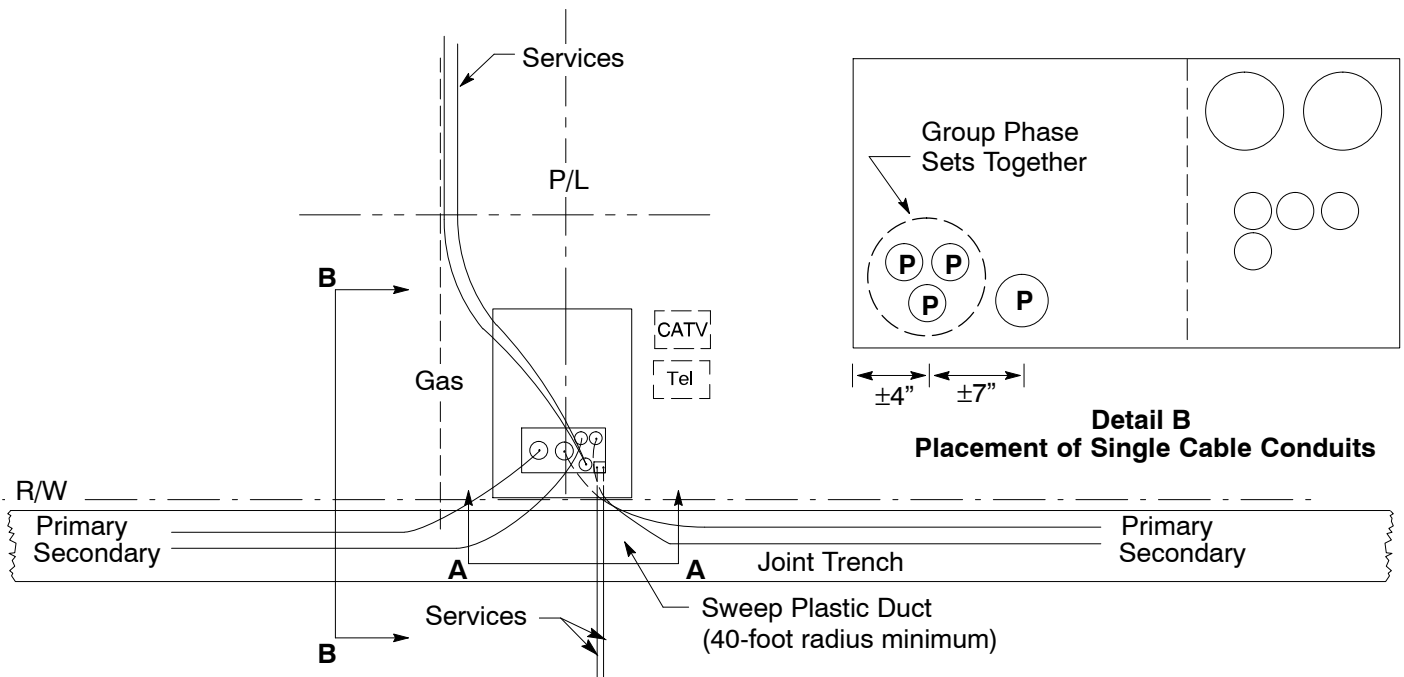
**Figure 1  
Box-Pad**

### Box-Pad For Pad-Mounted Transformers

#### Typical Box-Pad Installation

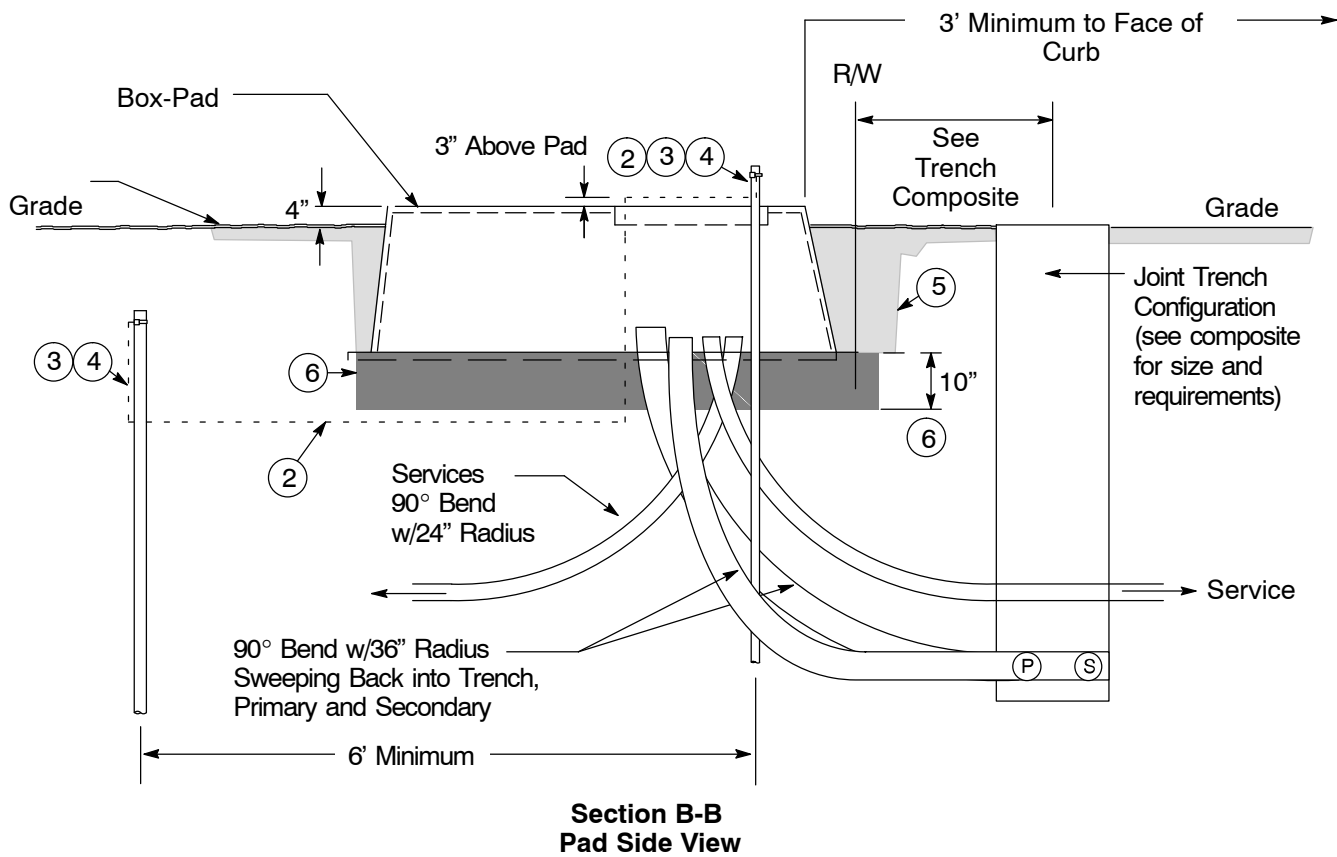
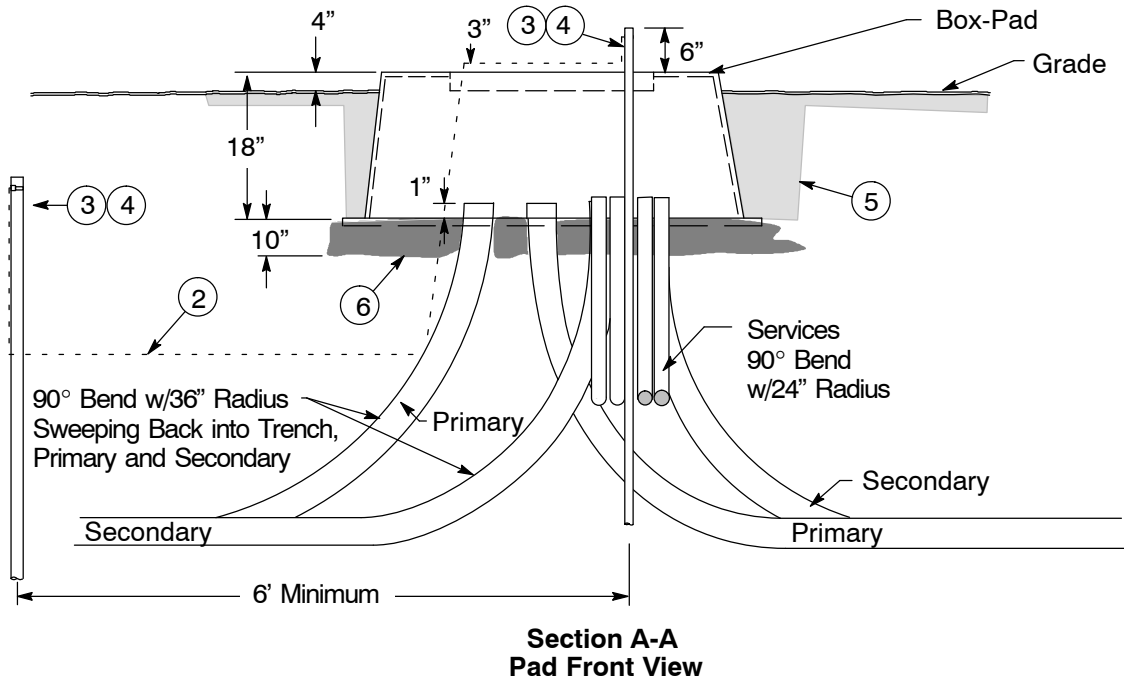


**Figure 2**  
Pad Top View  
(50" x 52" x 18" box-pad shown)



**Figure 3**  
Facilities Plan View

Typical Box-Pad Installation (continued)



## Box-Pad For Pad-Mounted Transformers

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This document is also found in the [Electric and Gas Service Requirements Manual](#) (Greenbook). This document has been split. See [Document 064309A](#) in the “Transformers” section of the *For Reference Only Manual (FRO)* for its remainder.

### Revision Notes

Revision 10 has the following changes:

1. Added Note 20 on Page 2.
2. Updated References on Page 3.