

# Padvault — 7' × 12' (94" × 155") for 600-Amp, Deadfront Switchgear

## 1 Scope

This specification outlines the minimum requirements for the construction of padvaults to be used in conjunction with conduit on 15 and 25 kV, 600-amp electrical systems. The specification applies whether the padvault is to be installed by company personnel, contractor, customer, or supplier.

## 2 Approval

This material specification is not considered valid unless each page contains the approval signature (or initials) of the person named in the title blocks.

## 3 Related Standards

Except as specified within this document, padvaults shall comply with the latest revisions of the following PacifiCorp and industry standards:

ZG 301, *General Equipment Base and Enclosure Requirements*

ZG 311, *Concrete Requirements*

ZG 821, *Incidental-Traffic Cover For Padvaults*

Applicable codes

ANSI standards

NEMA standards

IEEE standards

## 4 General

### 4.1 Application Information

All padvaults are based on two common vault bases and a lid that is designed to fit the specific equipment. Refer to Figure 6 for dimensions. Padvaults shall have personnel access provided by two access covers. Equipment openings in the padvault are sized for PacifiCorp's 600-amp deadfront switchgear. Padvaults shall have an internal grounding system with internal and external bushings for connecting ground conductors. Padvaults shall also have "TERM-A-DUCT" entrances to simplify conduit connections.

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Standards Manager (D. Asgharian): *DDA*

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## 5 Padvault/Switchgear Stock Item Number Cross-Reference

Table 1, below, shows the padvault Stock Item Numbers (SI#) associated with the air-insulated switchgear:

Table 1—Padvault / Switchgear SI# Cross-Reference

Padvault SI#	Switchgear SI#	Switchgear Description
7992790	7992692	15kV, Type 3, when 1000kcmil cable is used
7992788	7992693	15kV, Type 9
7992788	7992694	15kV, Type 11
7992790	7992695	25kV, Type 3, when 1000kcmil cable is used
7992789	7992696	25kV, Type 9
7992789	7992697	25kV, Type 11



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## 6 Padvault Design and Layout

### 6.1 Padvault Layout

Figure 1 shows the general layout of padvaults defined in this specification.

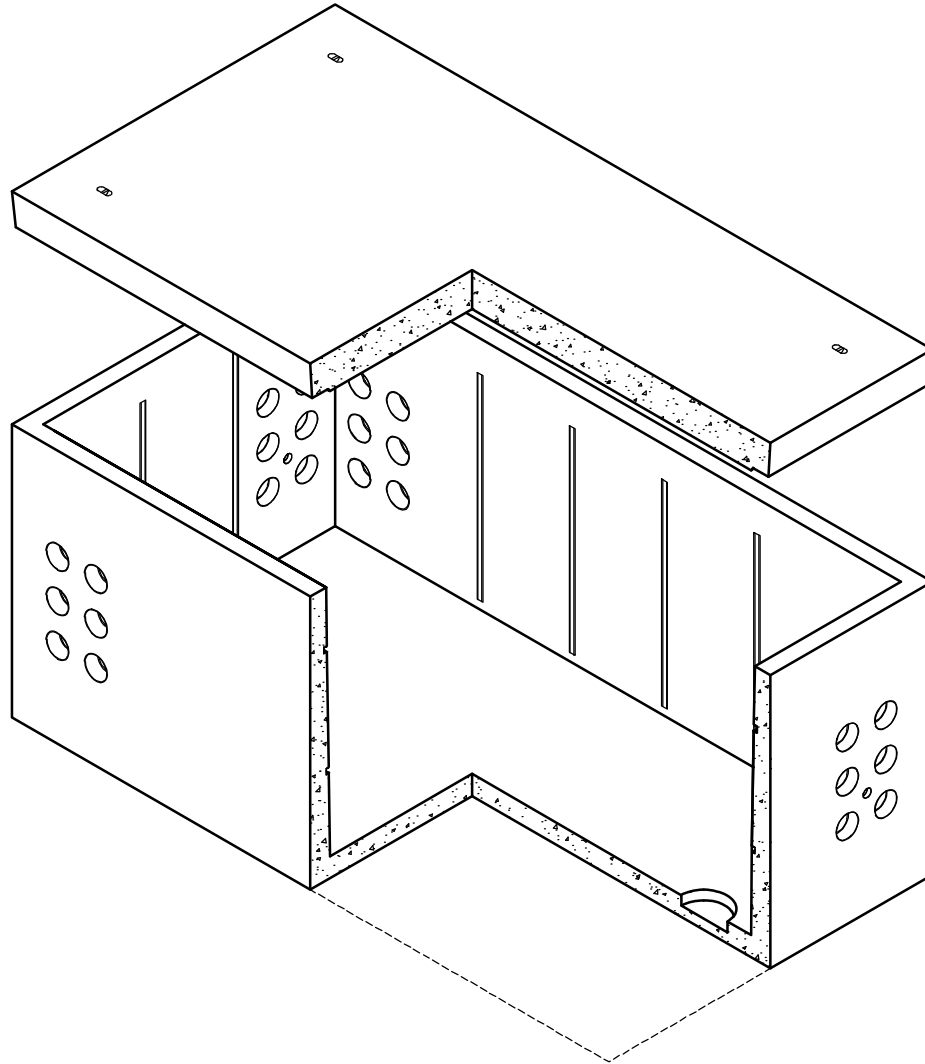


Figure 1—A typical 7' × 12' (94" × 155") Padvault Layout

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## 6.2 Padvault Top Layouts for Each Switchgear Type

Figure 2 through Figure 4 show the layouts of the padvault lids defined in this specification.

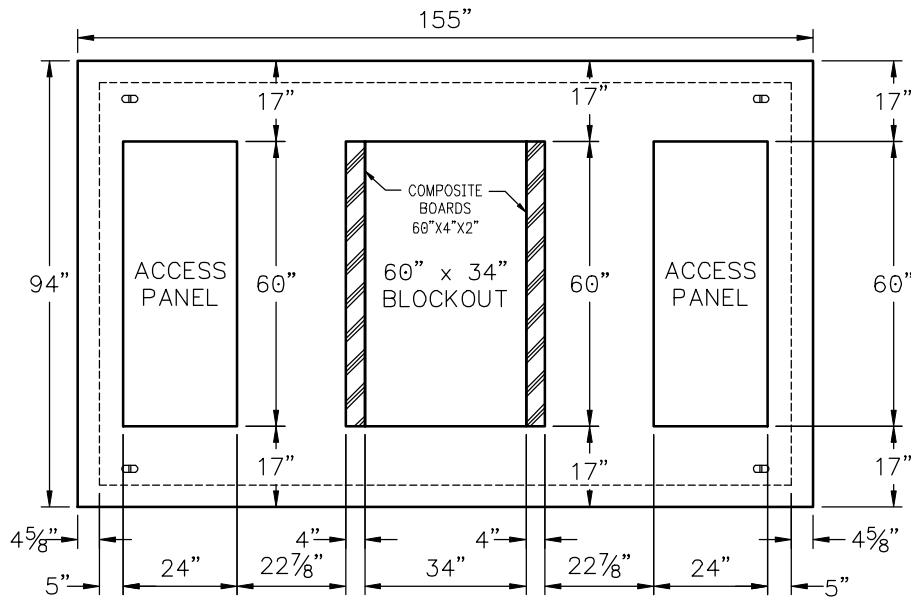


Figure 2—Padvault Pad Layout (SI# 7992790) for 15/25 kV, 600-Amp Type-3 Switchgear with 1000kcmil cable

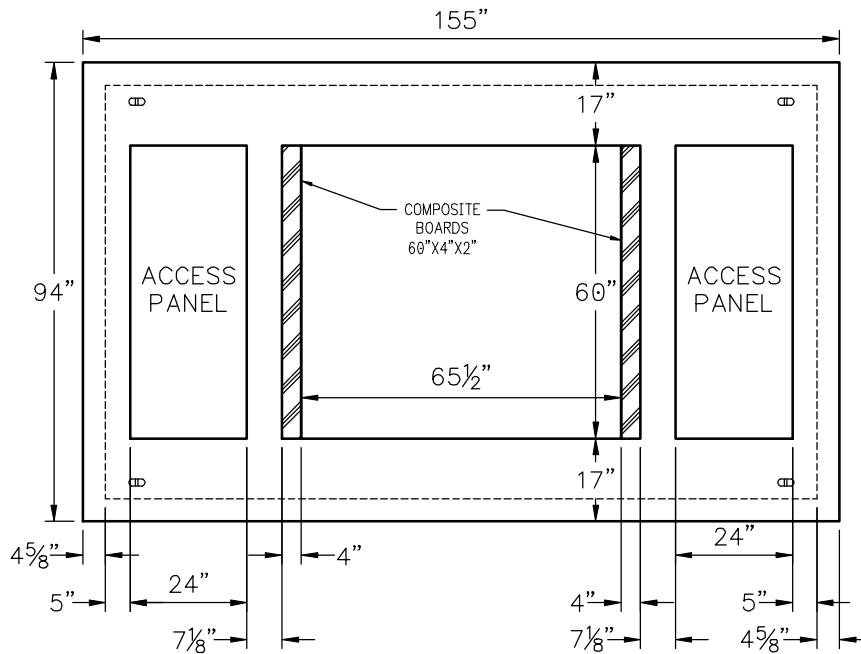


Figure 3—Padvault Pad Layout (SI# 7992788) for 15 kV, 600-Amp Type-9/11 Switchgear



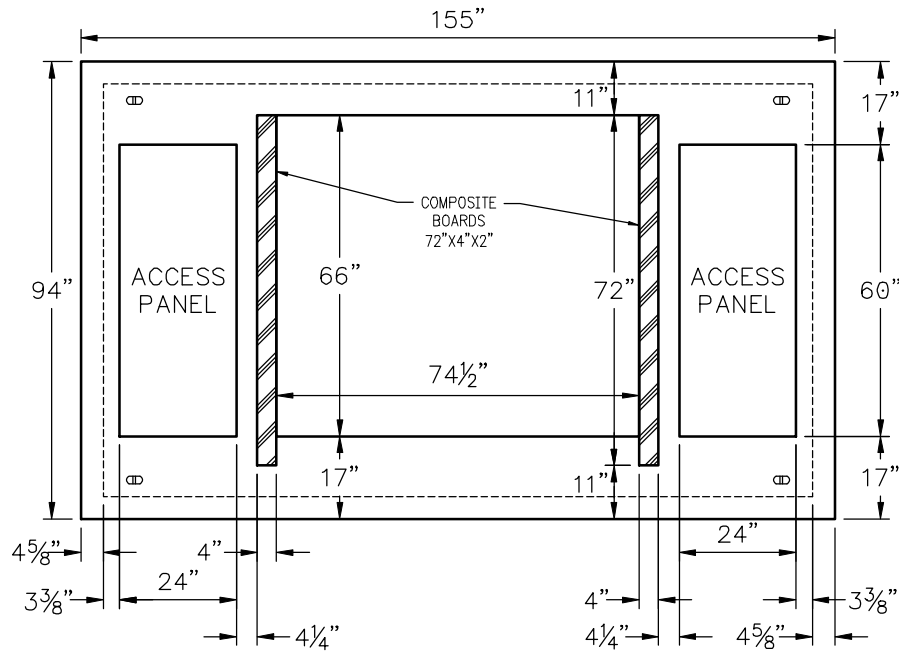


Figure 4—Padvault Pad Layout (SI# 7992789) for 25 kV, 600-Amp Type-9/11 Switchgear

### 6.3 Switchgear Attachment to Padvault

The padvault supplier shall provide two (2) 2" × 4" (actual size no less than 1.5" × 3.5") composite boards for dead front switchgears such as PME or PSE. Boards shall be cast flush with the top of the padvault lid at locations specified in Figure 2 through Figure 4. Hardware to fasten the switchgear to the composite board shall be provided as follows:

By PacifiCorp:

1. four (4) 1/2" × 2" hot-dip-galvanized lag screws
2. four (4) 1/2" stainless steel flat washers

By vault provider:

1. four (4) hold-down cleats

### 6.4 Pulling Attachments

The padvault shall contain four (4) galvanized steel cable-pulling attachments. The pulling attachments shall be rated at a minimum pullout strength of 6000 pounds. The cable pulling attachments shall allow the attachment of a clevis with a one-inch diameter through-bolt. One pulling attachment shall be installed in the floor of the padvault at each corner. Pulling attachments may be designed by the manufacturer to meet these requirements.

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## 6.5 Lifting Attachments

Enough lifting attachments shall be provided to ensure safe installation at the site. All lifting attachments shall be galvanized.

## 6.6 Sump

The padvault shall be supplied with a twelve-inch (12") diameter sump, located below an access panel and centered under the access panel opening. No drain hole is accepted.

## 6.7 "C"-Channels

The 7' x 12' (94" x 155") padvault shall have hot-dip-galvanized "C"-channels cast in flush with each vault wall.

"C"-channels shall consist of four (4) three-foot (3') sections on each long wall and two (2) three-foot (3') sections on each short wall, as shown in Figure 5.

## 6.8 TERM-A-DUCT Conduit Entrances

The padvault shall be constructed with TERM-A-DUCT conduit entrances compatible with PVC, Polyethylene (PE), or fiberglass 90° C-rated electrical-grade conduit. TERM-A-DUCT entrance requirements are as follows:

Each end (short) wall: Two (2) banks of six (6) 6.63" TERM-A-DUCTS and two (2) 2.38" TERM-A-DUCTS, as shown in Figure 5.

Each side (long) wall: Two (2) banks of six (6) 6.63" TERM-A-DUCTS, as shown in Figure 5.

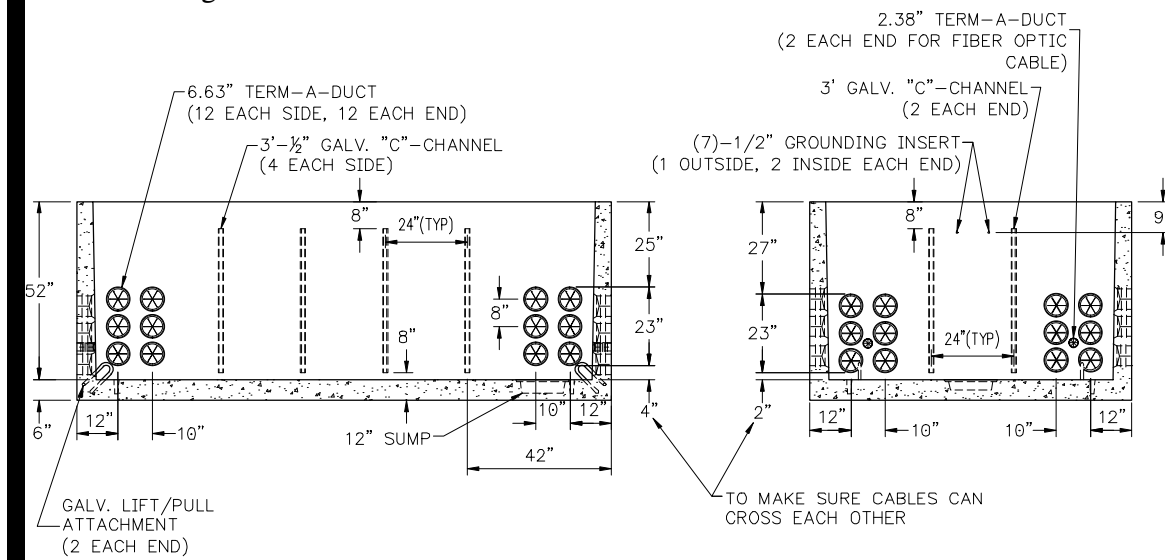


Figure 5—TERM-A-DUCT and "C"-Channel Requirements Detail for 7' x 12' (94" x 155") Padvault



**6.9 Grounding Grid**

The padvault shall be built with an internal, encased electrode in the base of the padvault meeting NESC 094.B.6 and consisting of 3/8" steel rebar. The electrode in the base shall be encased horizontally and run continuously around the vault base. The grounding system shall attach to connection inserts made of high-bronze alloy and threaded to 0.5"-13UNC. Each end (short) wall shall have two (2) inserts inside and one (1) insert outside, as shown in Figure 6. One (1) additional grounding insert shall be located on the lid, close to the access door. All inserts shall have caps or plugs installed.

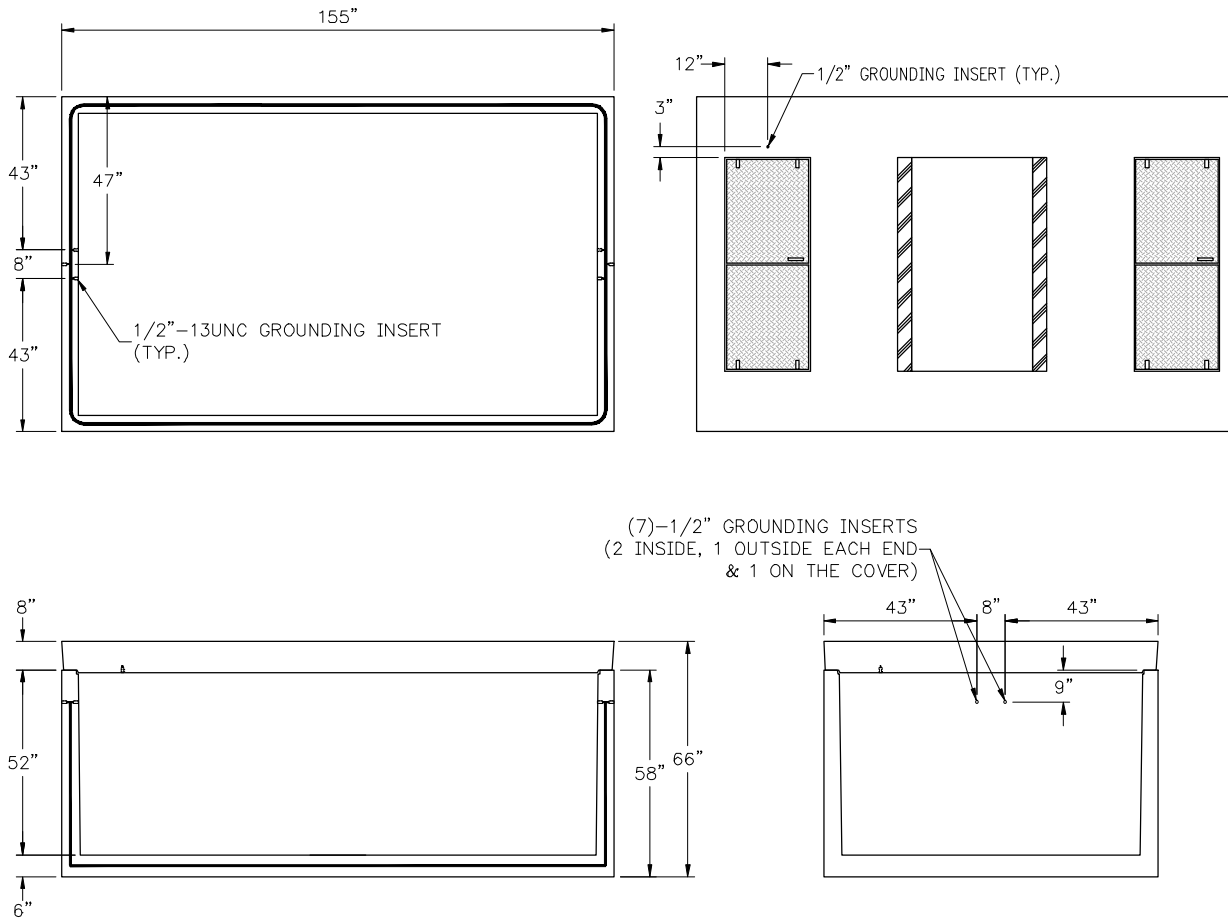


Figure 6—Grounding Grid for 7' x 12' (94" x 155") Padvault

**6.10 Access Panels**

The 7' x 12' (94" x 155") padvault shall have two access doors. The access door openings, as measured between opposite inside walls of the frame assembly, shall not

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exceed 24" × 60". For further details, refer to Material Specification ZG 821, *Incidental-Traffic Cover For Padvaults*.

## 6.11 Installation

The padvault shall be off-loaded and set by the padvault supplier to maintain warranties, unless there are extenuating circumstances. Site preparation and excavation shall be performed by PacifiCorp, contractor, customer or supplier, as necessary to ensure proper placement. Beneath the padvault shall be a layer of gravel, compacted, and graded level, to final thickness of six inches (6"). The joint between the two padvault sections shall be sealed with the gasket and sealant provided by the padvault supplier.

## 7 Testing

### 7.1 Compliance

Padvaults submitted under this specification shall meet all tests and requirements contained in ZG 301, *General Equipment Base and Enclosure Requirements*, ZG 311, *Concrete Requirements*, and this specification. Padvaults shall also comply with requirements in applicable national standards.

### 7.2 Security Test

With appropriate switchgear mounted, attempt to pass a #14 AWG soft-drawn copper wire through the interface between the cabinet and pad. If the wire can be passed through, the padvault has failed the test and is not acceptable.

## 8 Issuing Department

The Engineering and Asset Management Documentation department of PacifiCorp published this document. Questions regarding editing, revision history and document output may be directed to the lead editor at (503) 813-5293. Technical questions and comments may be directed to Ehsan Maleki, Standards Engineering, (503) 813-7089.

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