

# **ZG 562 Padvault—7' × 12' (94" × 155"), for 600-Amp, Dead-Front 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. Related Standards**

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

### **2.1. Company Material Specifications**

*ZG 301, General Equipment Base and Enclosure Requirements*

*ZG 311, Concrete Requirements*

*ZG 811, Full Traffic Cover and Frame Assembly*

### **2.2. Codes and Standards**

Applicable codes

ANSI standards

NEMA standards

IEEE standards

## **3. General**

### **3.1. 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 the company'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.

## **4. Padvault/Switchgear Stock Item Number Cross-Reference**

Table 1, below, shows the padvault stock item numbers (SI#) associated with the air-insulated switchgear:

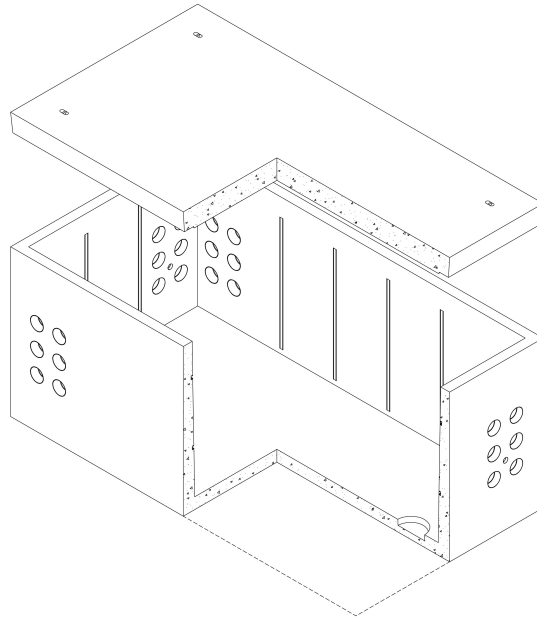
**Table I — Padvault / Switchgear SI# Cross-Reference**

Padvault SI#	Switchgear SI#	Switchgear Description
8004416	7992692	15 kV, Type 3, when 1000 kcmil cable is used
8004414	7992693	15 kV, Type 9
8004414	7992694	15 kV, Type 11
8004416	7992695	25 kV, Type 3, when 1000 kcmil cable is used
8004415	7992696	25 kV, Type 9
8004415	7992697	25 kV, Type 11

## 5. Padvault Design and Layout

### 5.1. Padvault Layout

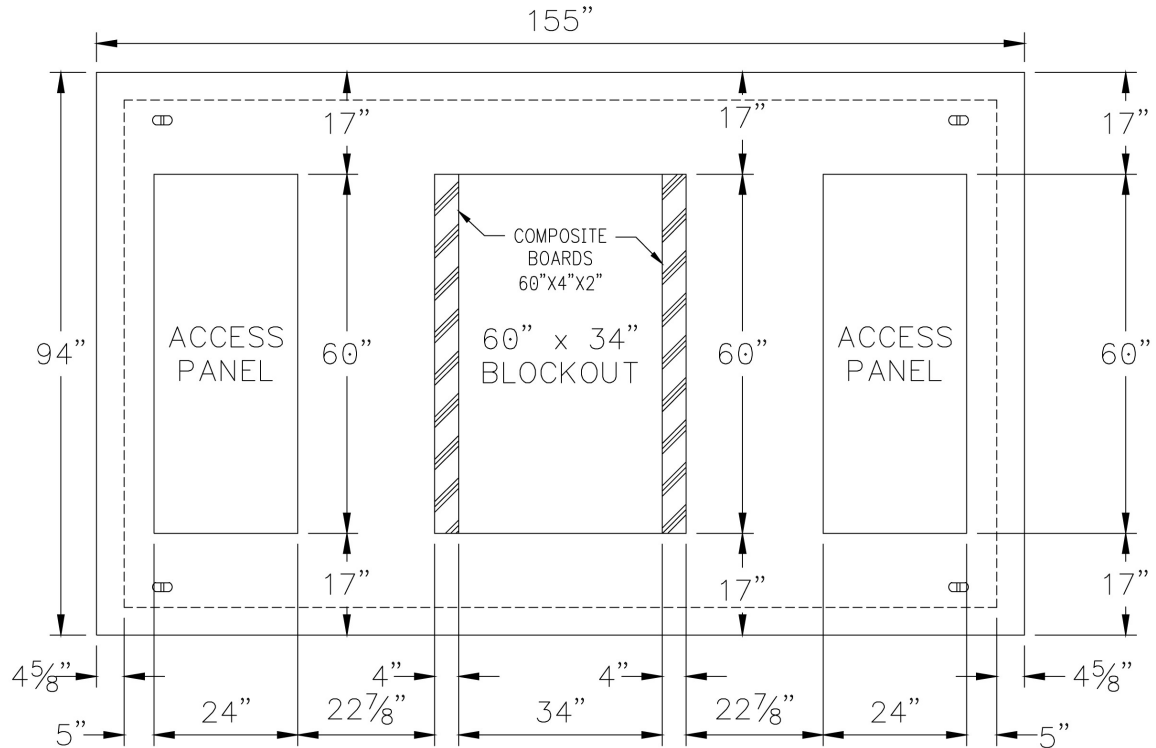
Figure 1 shows the general layout of padvaults defined in this specification.



**Figure I — A typical 7' x 12' (94" x 155") Padvault Layout**

## 5.2. 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# 8004416) for 15/25 kV, 600-Amp Type-3 Switchgear with 1000 kcmil cable**

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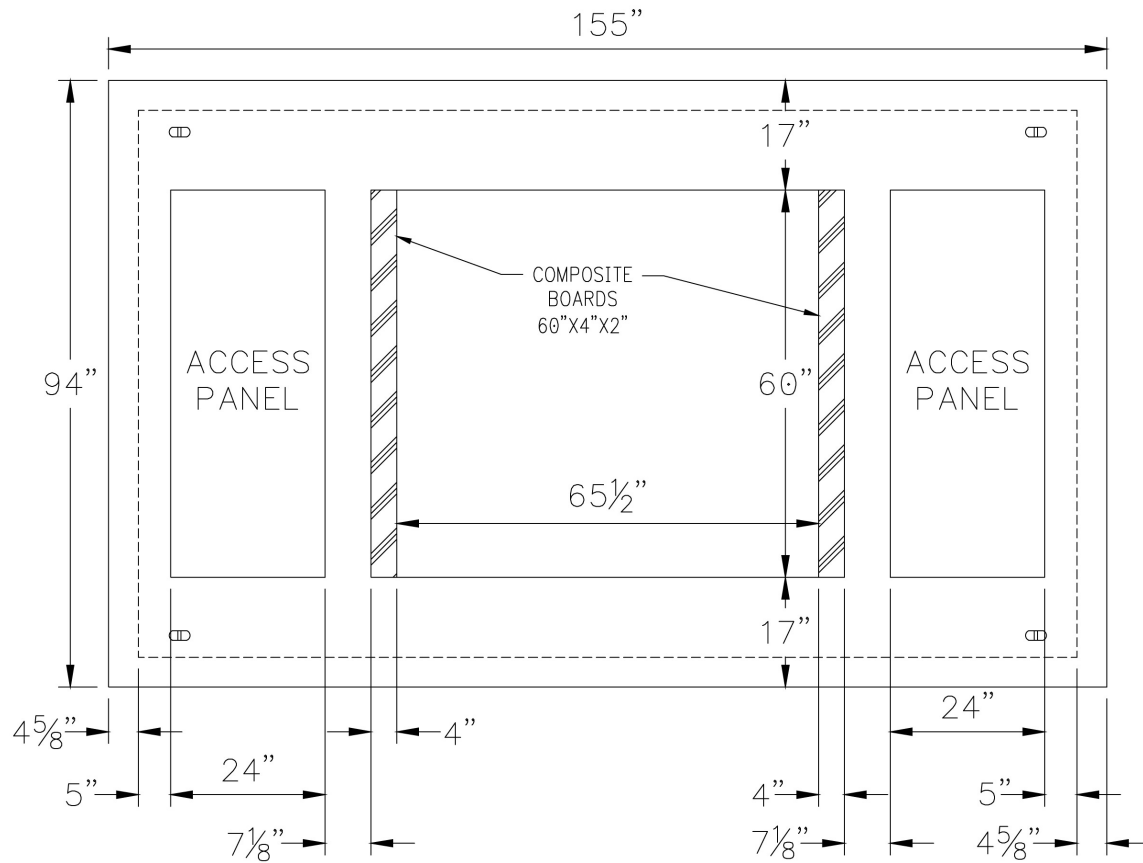
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**Figure 3 — Padvault Pad Layout (SI# 8004414) for 15 kV, 600-Amp Type-9/11 Switchgear**

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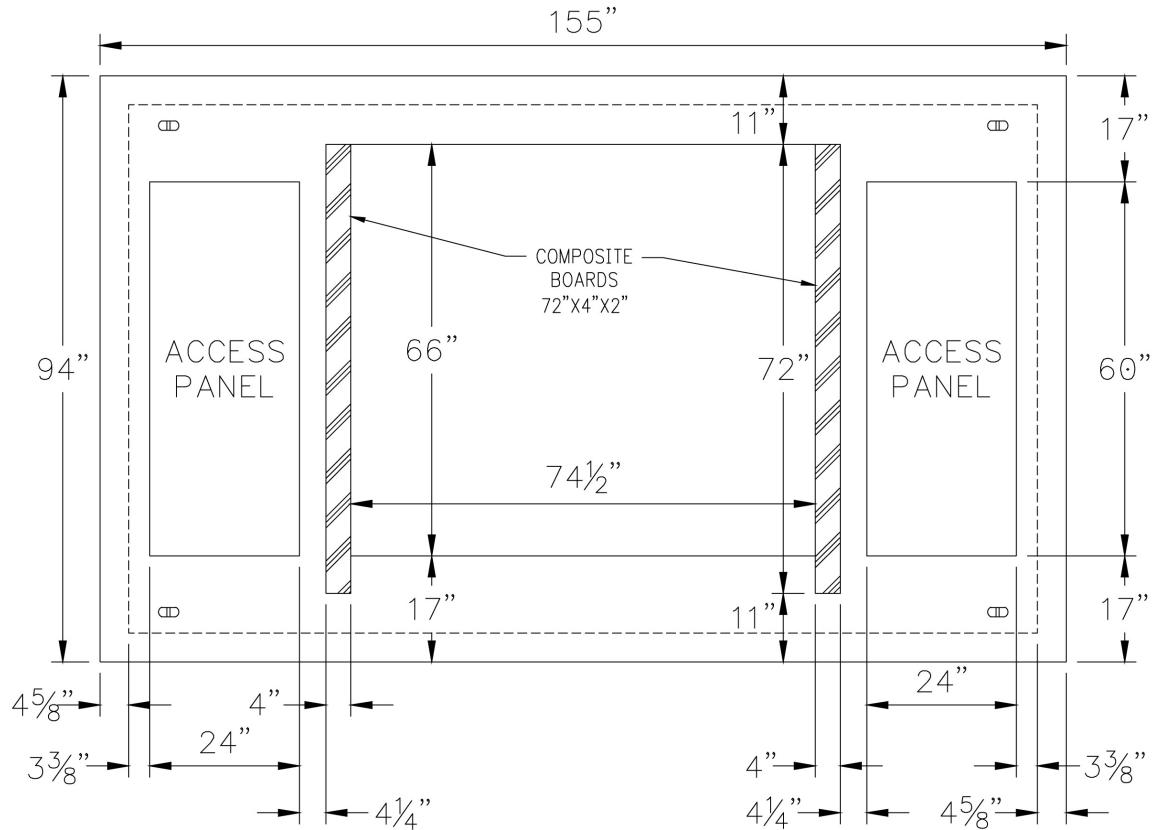
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**Figure 4 — Padvault Pad Layout (SI# 8004415) for 25 kV, 600-Amp Type-9/1 I Switchgear**

### 5.3. Switchgear Attachment to Padvault

The padvault supplier shall provide two 2" x 4" (actual size no less than 1.5" x 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 the company:

- a. four 1/2" x 2" hot-dip-galvanized lag screws
- b. four 1/2" stainless steel flat washers

By vault provider:

- a. four hold-down cleats

### 5.4. Pulling Attachments

The padvault shall contain four galvanized steel cable-pulling attachments. The pulling attachments shall be rated at a minimum pullout strength of 6,000 pounds. The cable pulling

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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.

### 5.5. Lifting Attachments

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

### 5.6. Sump

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

### 5.7. Attachment Embeds

The 7' x 12' (94" x 155") padvault shall have attachment embeds cast in flush with each vault wall.

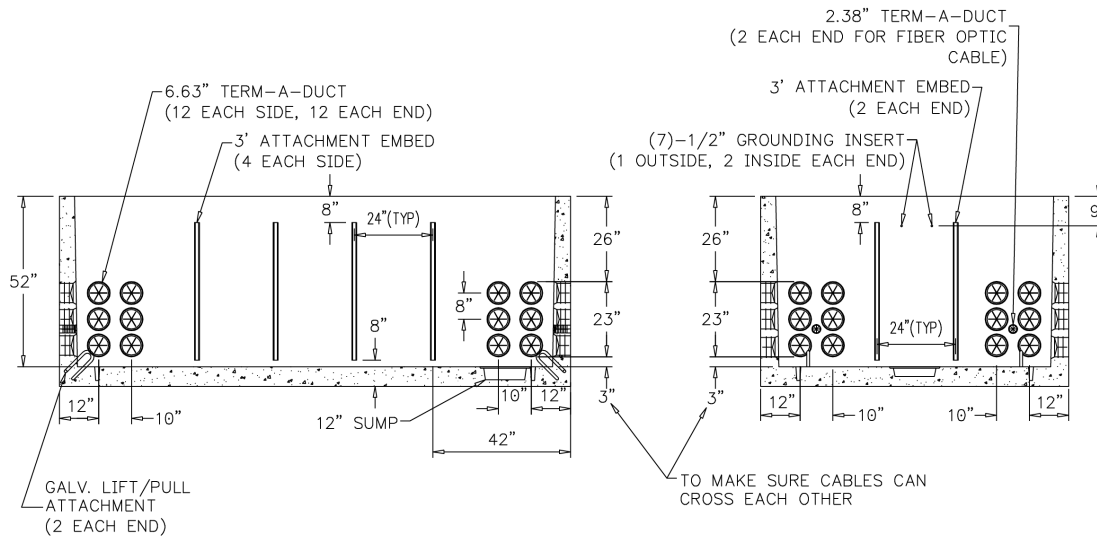
Attachment embeds shall be galvanized or fiberglass 1-5/8" × 13/16" C-channel or Nox-Crete 1-1/2" Nox-Strut. Embeds shall consist of four 3-foot sections on each long wall and two 3-foot sections on each short wall, as shown in Figure 5.

### 5.8. 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 banks of six 6.63-inch Term-A-Ducts and two 2.38-inch Term-A-Ducts, as shown in Figure 5.

Each side (long) wall: Two banks of six 6.63-inch Term-A-Ducts, as shown in Figure 5.

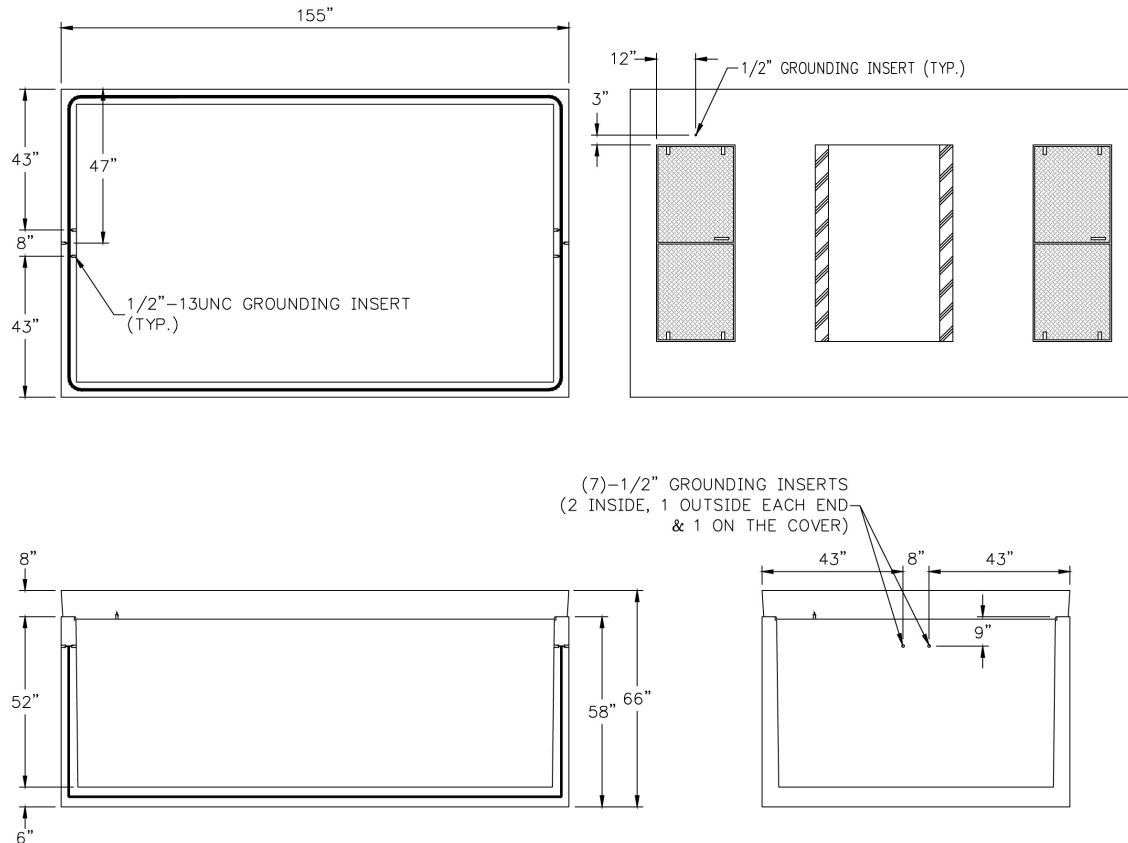


**Figure 5 — Term-A-Duct and “CI-Channel Requirements Detail for 7' x 12' (94" x 155") Padvault**

### 5.9. 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  $\frac{3}{8}$ -inch 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-inch-13UNC. Each end (short) wall shall have two inserts inside and one insert outside, as shown in Figure 6. One additional grounding insert shall be located on the lid, close to the access door. All inserts shall have caps or plugs installed.

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

### 5.10. 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 exceed 24" x 60". For further details, refer to material specification ZG 811.

### 5.11. 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 the company, 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 6 inches. The joint between the two padvault sections shall be sealed with the gasket and sealant provided by the padvault supplier.

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## 6. Testing

### 6.1. 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.

### 6.2. 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.

## 7. Issuing Department

The engineering standards and grid modernization department of PacifiCorp published this material specification. This material specification shall be used and duplicated only in support of company projects.

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