

# ZG 52I Padvault—Three-Phase Transformer

## 1. Scope

This material specification outlines the minimum requirements for padvaults to be used in conjunction with company-owned, three-phase, pad-mounted transformers (see Figure 1). The material specification applies whether the padvault is to be installed by company personnel, contractor, customer, or the supplier.

## 2. Applicable Documents

The latest revisions of the documents, standards, codes, and requirements listed in 2.1 Company Specifications and 2.2 Codes and Standards, in effect on the date of invitation to bid apply to the extent specified herein.

### 2.1. Company Material Specifications

ZG 301 *General Equipment Base and Enclosure Requirements*

ZG 311 *Concrete Requirements*

ZG 621 *Padvault—5' × 7' (56" × 84")*, for Three-Phase Sectionalizing Cabinets and Metering Equipment

ZG 641 *Padvault—Shallow, 7' × 7' (84" × 84")*

ZG 811 *Full Traffic Cover and Frame Assembly*

### 2.2. Codes and Standards

ASTM C 857 A-16

AASHTO H-20 (for vault, beneath roadways)

ASTM C 857 A-8 (for vault, beneath incidental light truck traffic)

## 3. Definitions

Company refers to PacifiCorp.

PacifiCorp refers to Pacific Power and Rocky Mountain Power.

## 4. General

This material specification states material and construction requirements that are applicable to all three-phase transformer pads.

## 5. Applicable Stock Item Numbers

Materials being submitted for the following company stock item numbers are subject to evaluation in accordance with requirements in this material specification.

7992600: Includes a 56" × 84" × 48" padvault plus an 84" × 112" padvault pad for 2.4–25 kV, 75–750 kVA transformers

7992958: Includes an 84" × 84" × 54" padvault plus a 84" × 112" padvault pad for 2.4–25 kV, 1000–2500 transformers

7992602: Includes a 56" × 84" × 48" padvault plus a 96" × 112" padvault pad for 35 kV, 75–750 kVA transformers

7992959: Includes an 84" × 84" × 54" padvault plus a 96" × 112" padvault pad for 35 kV, 1000–2500 transformers

## 6. Design and Manufacturing Requirements

The purpose of a three-phase transformer padvault is to support a three-phase transformer.

### 6.1. Padvault Layout

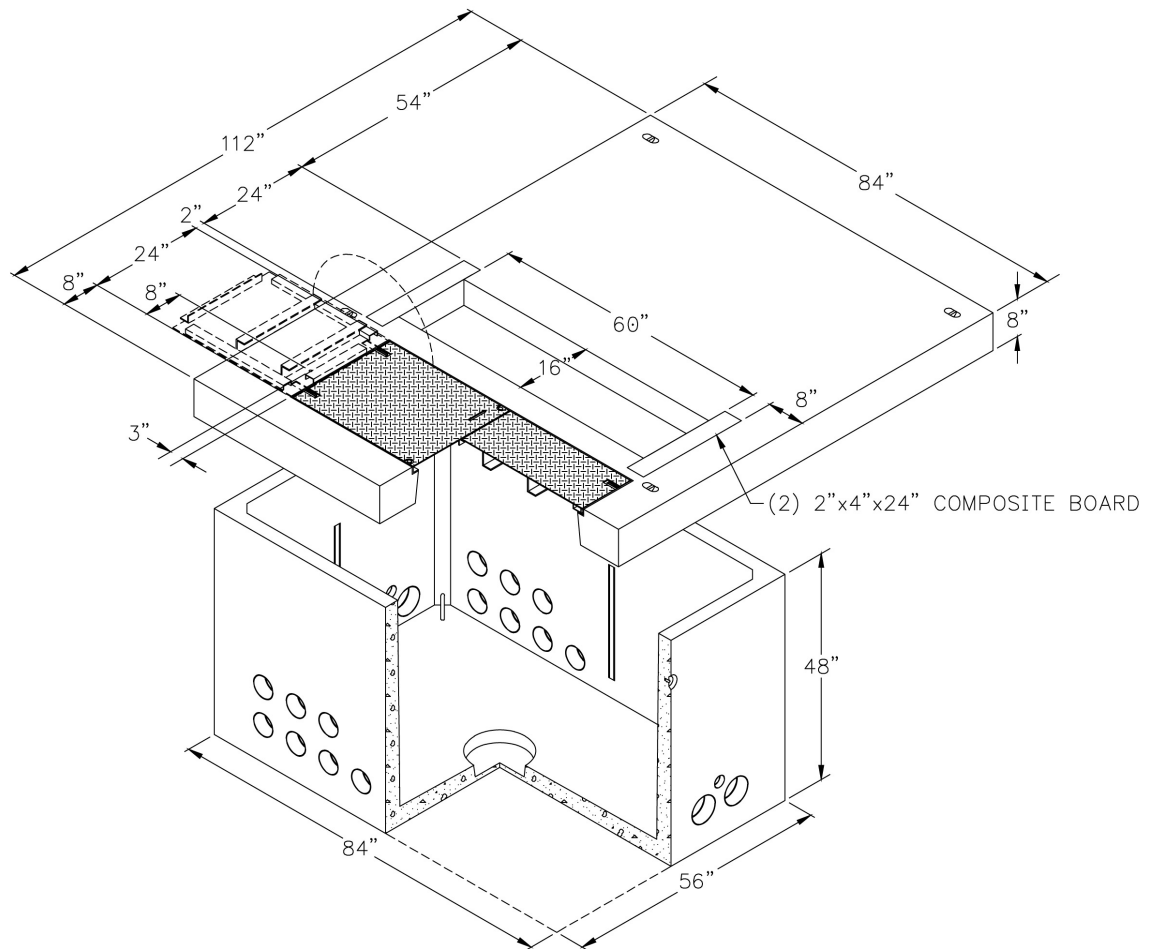
The three-phase transformer padvault is a combination of a padvault and a padvault pad (lid). Unless otherwise approved by the company, all dimensions and placement of hardware shall conform to those shown in Figure 1 and Figure 3 of this document. The three-phase transformer padvaults use two common bases. The first base is a 56" × 84" × 48" padvault. The second base is an 84" × 84" × 54" padvault. Also, each padvault will use two different pads (lids) to offer adequate space for multiple sizes of transformers and associated voltages.

### 6.2. Mounting and Mounting Hardware

The supplier shall provide:

- two 2" × 4" × 24" composite boards for a three-phase transformer, cast flush with the top of the padvault lid, at the locations specified in Figure 1 and Figure 3.
- two 1-1/4" × 2-1/2" stainless steel hold-down cleats with 1/4" lift and 9/16" × 1-1/2" holes.

All loose hardware shall be packaged, and the package shall be attached to one of the padvault walls.



**Figure I —Padvault for 2.4–25 kV, Three-Phase, 75–750 kVA Transformer  
(SI# 7992600)**

**Material Specification**

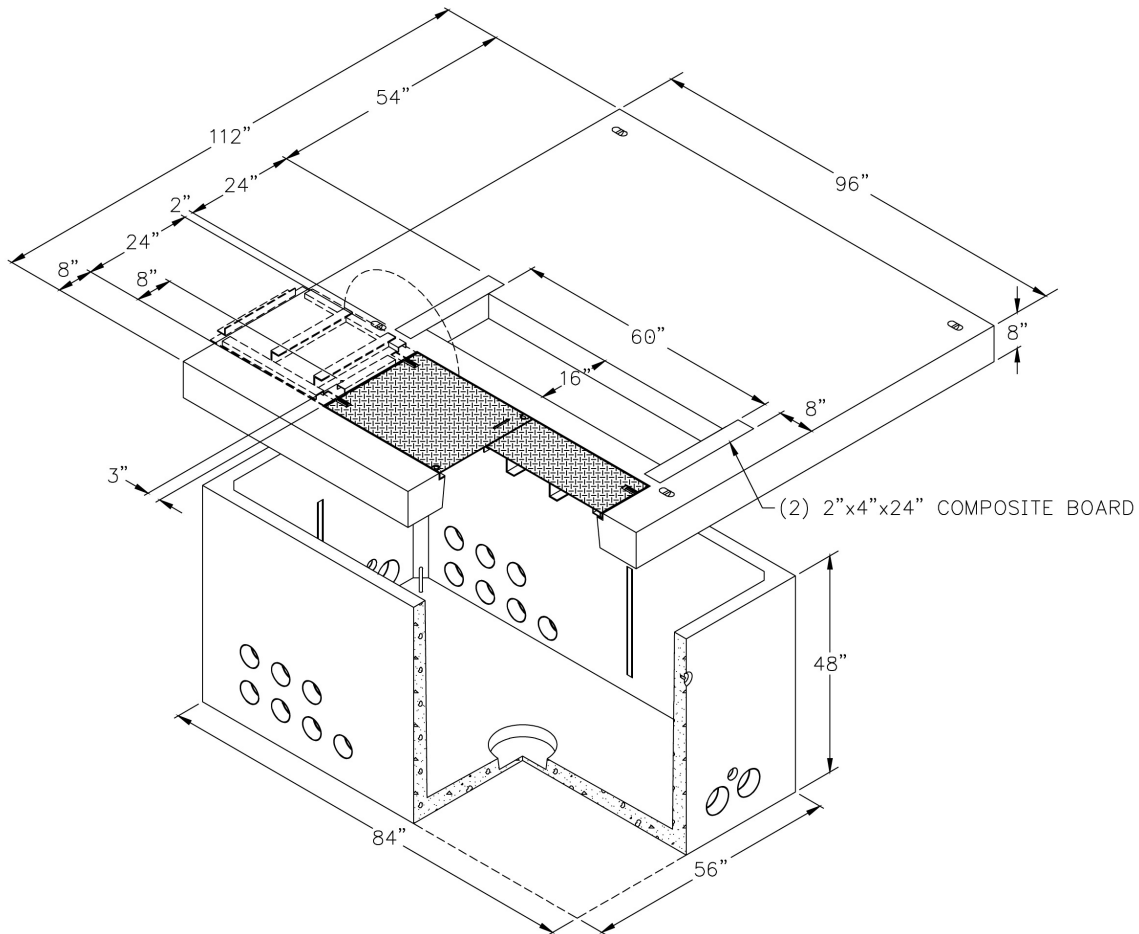
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**Figure 2 —Padvault for 35 kV, Three-Phase, 75–750 kVA Transformer  
(SI# 7992602)**

**Material Specification**

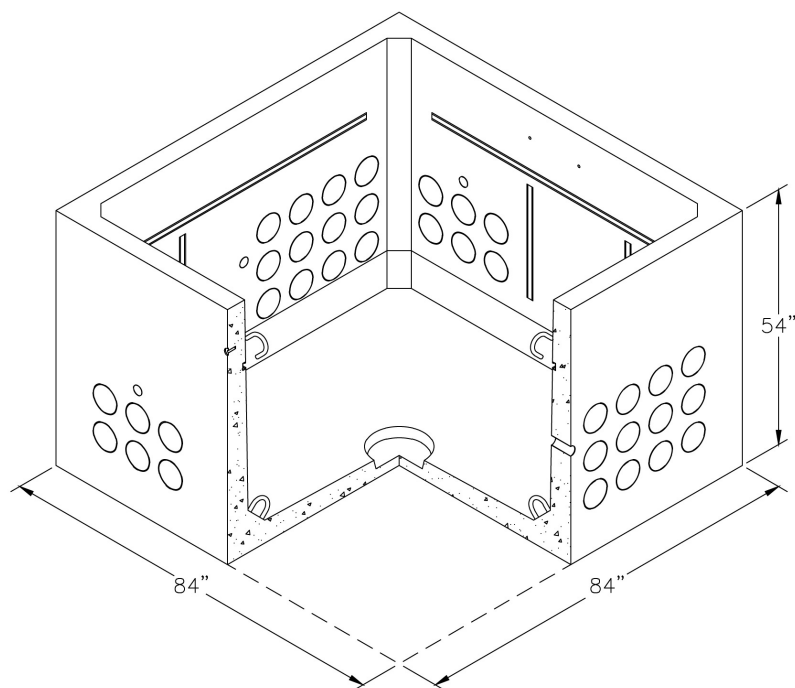
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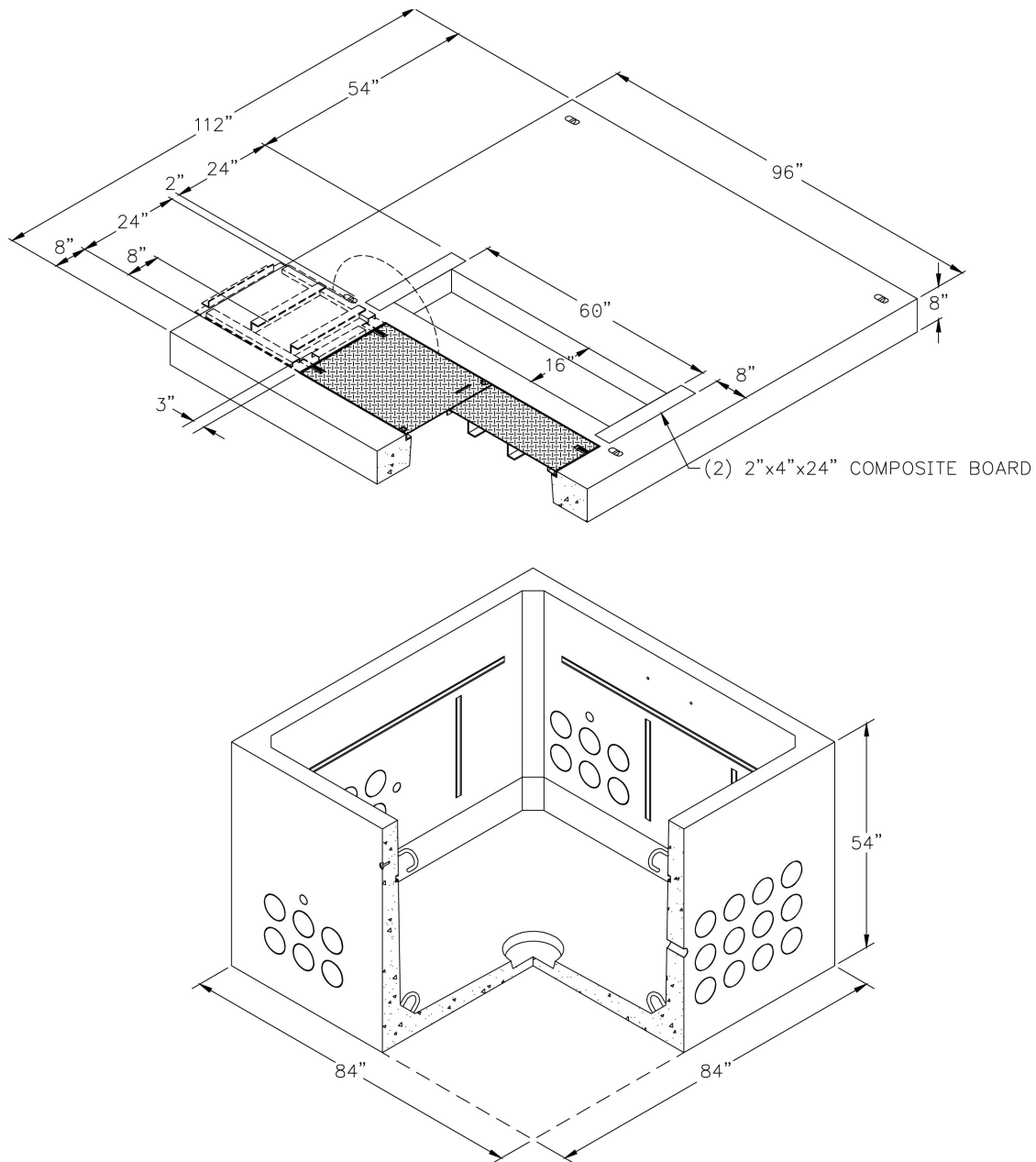
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**Figure 4 —Padvault for 35 kV, Three-Phase, 1000–2500 kVA Transformer Padvault (SI# 7992959)**

**Material Specification**

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### 6.3. Pulling Attachments

Refer to ZG 621 and ZG 641 for pulling attachment specifications. Pulling attachments shall be rated for 6000 lbs of pulling tension.

### 6.4. Grounding Grid

Each vault shall be constructed with an encased electrode meeting NESC 094.B.6. The  $\frac{3}{8}$ -inch steel rebar shall be 20 continuous feet in length, embedded in concrete at least 24 inches below finished grade when the vault is set. The grounding system attaches to a connection insert of high-strength bronze alloy, threaded to  $\frac{1}{2}$ -inch 13 UNC. The vertical rebar attaching to the bronze connection shall be welded or connected by a minimum of a copper-clad  $\frac{5}{8}$ -inch ground clamp.

Each padvault shall have five grounding inserts: two on opposite side walls and one at the cover.

Two inserts on opposite side walls shall be available for connection on the inside and the outside of the vault. The outside grounding inserts shall be centered on the side walls. The inside inserts shall be centered on the on the side wall or located no less than 6 inches from diagonal corners. The cover pad grounding insert shall be accessible from inside the vault.

### 6.5. Conduit Entrances

Refer to ZG 621 and ZG 641 for locations of conduit entrances.

### 6.6. Lifting Attachments

Enough lifting attachments shall be provided to ensure safe installation of all pieces at the site.

### 6.7. Access Panels

All three-phase transformer pads that rest on an padvault shall have a single access door no larger than 24" × 60". The access door must meet all requirements in specification ZG 811.

### 6.8. Attachment Embed

Attachment embeds shall be galvanized or fiberglass  $1\frac{5}{8}" \times 1\frac{13}{16}"$  C-channel or Nox-Crete  $1\frac{1}{2}"$  Nox-Strut. See the vault specification for length and rotation.

### 6.9. Installation

This unit shall be installed at the site by the supplier or contractor. There shall be a 6-inch base of  $\frac{3}{4}$ -inch-minus gravel under any part of the pad that hangs off the padvault. The 6-inch gravel base shall be compacted to 90% dry density, and shall be level to the top of the padvault. The joint between the pad and padvault shall be sealed using tar or mastic. The top of the pad should be two to four inches above final grade, when installed.

## 7. Testing

### 7.1. Test Compliance

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

### 7.2. Security Test

Transformer padvaults must be designed and tested to ensure that padmount equipment is not compromised by uneven pad setting. And, with the appropriate transformer 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. Material Specification 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.