ZG 701 Manhole—7' × 12' (94" × 155")

1. Scope

This specification outlines the minimum requirements for 7′ × 12′ (94″ × 155″) manholes to be used in full and incidental traffic areas. The specification applies regardless of whether the customer, contractor, supplier, or the company installs the manhole.

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 562, *Padvault—7' × 12 ' (94" × 155"), for 600-Amp, Dead-Front Switchgear*
ZG 811, *Full Traffic Cover and Frame Assembly*

2.2. Codes and Standards

Applicable codes
ANSI standards
IEEE standards
NEMA standards
AASHTO standards
IEEEC2, *National Electric Safety Code (NESC)*

3. General

3.1. Application Information

This specification states material and construction requirements which are applicable only to 7′ × 12′ (94″ × 155″) manholes.

4. Definitions

Company. Refers to PacifiCorp

PacifiCorp. Refers to Pacific Power and Rocky Mountain Power.

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 specification.

5.1. Stock Item Numbers

7992596, MANHOLE, CONCRETE, 7′ × 12′ (94″ × 155″), FULL TRAFFIC, WITH GROUND GRID

7992597, MANHOLE, CONCRETE, 7′ × 12′ (94″ × 155″), INCIDENTAL TRAFFIC, WITH GROUND GRID

6. Design and Manufacturing Requirements

The purpose of a 7′ × 12′ (94″ × 155″) manhole is to provide an enclosure for cable pulling, splicing, and single-phase switching.

6.1. Manhole Layout

Figure 3 below shows the assembled 7′ × 12′ (94″ × 155″) manholes with dimensions. The manhole is made up of an enclosure with two built in cover assemblies. Unless otherwise approved by company engineering, all dimensions and placement of hardware shall conform to those shown in Figure 1, Figure 2, Figure 3 and Figure 4 below. All manhole enclosures shall be constructed to AASHTO H-20 (full-traffic) standards, regardless of the cover and frame assembly used.

6.2. Lifting Attachments

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

6.3. Pulling Attachments

Cable pulling attachments shall be installed in the bottom corners of the enclosure such that blocks may be attached for a straight cable pull. Pulling attachments shall be made of galvanized steel and have a minimum pullout strength of 6,000 pounds. Cable pulling attachments shall accommodate attachment of a clevis with a one-inch-diameter through-bolt. Pulling attachments may be designed by the manufacturer to meet these requirements.

6.4. Conduit Entrances

The top portion of the enclosure shall have four 6-inch TERM-A-DUCT entrances on each end, spaced 10 inches center-to-center. For TERM-A-DUCT layout in the top portion, refer to Figure 3. For TERM-A-DUCT layout in the bottom portion, refer to ZG 562.

6.5. Full Traffic Access Cover (SI# 7992596)

Two full traffic rated access covers, as specified in ZG 811, shall be included with the assembly as shown in Figure 1 below. Additional rings may be used to bring to grade; see ZG 811 for grade rings.

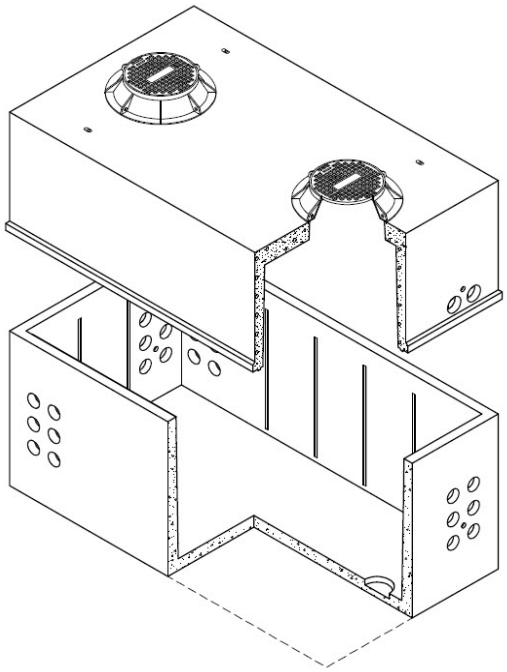

Figure 1—7′ × 12′ (94″ × 155″) Manhole with Full-Traffic Covers (SI# 7992596)

6.6. Incidental Traffic Access Door (SI# 7992597)

Two incidental traffic rated doors no larger than 36″ × 36″, as specified in ZG 811, shall be included with the assembly as shown in Figure 2 below.

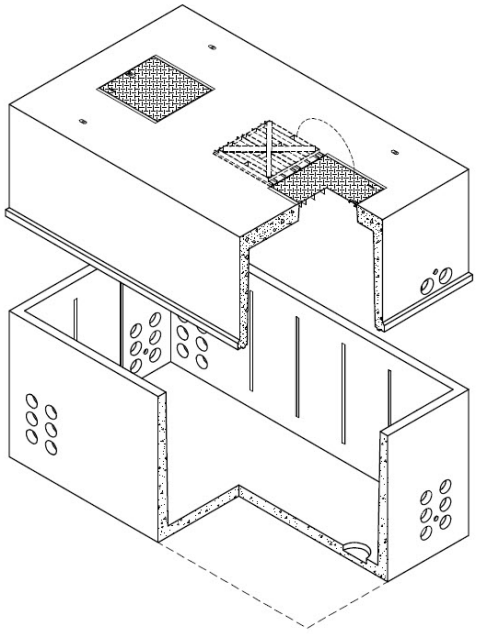

Figure 2—7′ × 12′ (94″ × 155″) Manhole with Incidental-Traffic Covers (SI# 7992597)

6.7. Attachment Embeds

Attachment embeds shall be galvanized or fiberglass 1-5/8″ × 13/16″ C-channel or Nox-Crete 1-1/2″ Nox-Strut. The top portion shall have four 36-inch long attachment embeds on each side wall with two 36-inch attachment embeds on each end wall. See Figure 3 for attachment embed for length and rotation in the top portion. Refer to ZG 562 for the layout of the attachment embeds in the bottom portion.

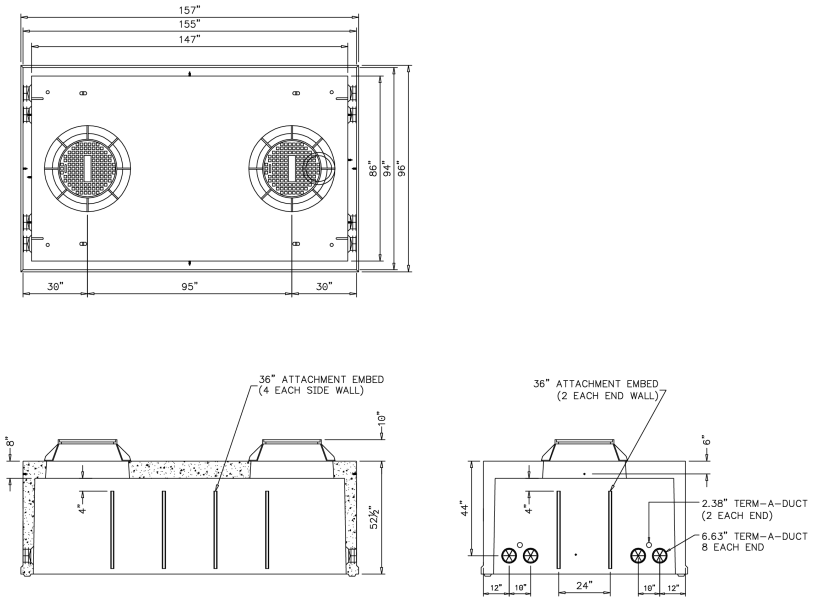

Figure 3—7′ × 12′ (94″ × 155″) Manhole Top Layout

6.8. Grounding Grid

Each section of the 7′ × 12′ (94″ × 155″) manhole shall be constructed with an encased electrode meeting NESC. The ⅜″ steel rebar shall be 20 continuous feet in length (except for a 12″ break in the loop). The grounding system shall attach to a connection insert of high-strength bronze alloy, threaded to ½″ 13UNC. The vertical rebar attaching to the bronze insert shall be welded or connected by a copper-clad ⅝″ ground clamp to the ⅜″ steel rebar grounding loop.

The ⅜″ steel rebar loops of the top and bottom portions must be connected at each end by a piece of bare 4/0 copper wire, connected to the two internal grounding inserts found on each end. For the layout of the top section's ground grid, refer to Figure 4. For the bottom section, refer to ZG 562.

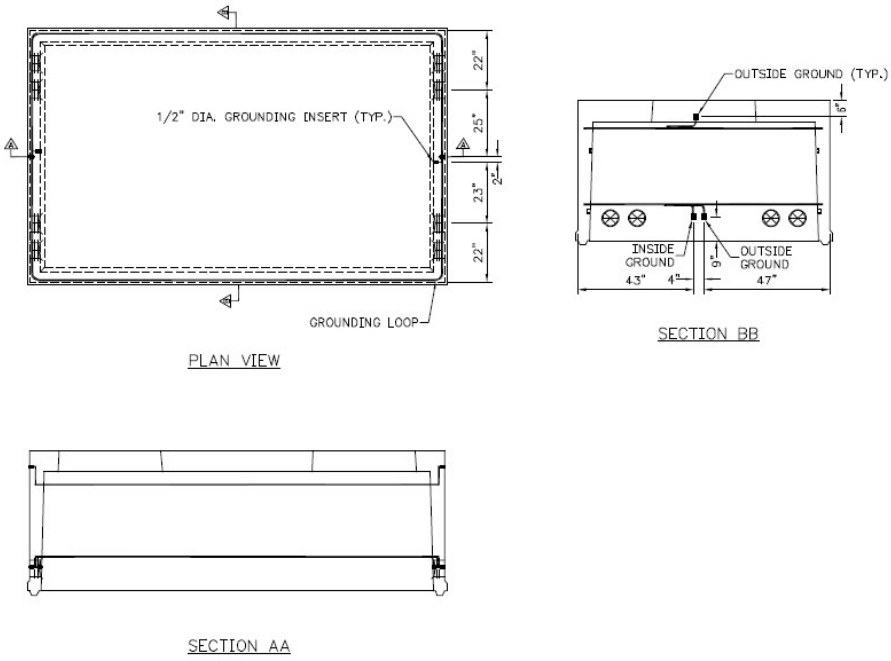

Figure 4—7′ × 12′ (94″ × 155″) Manhole Top Section Ground Grid

6.9. Installation

This unit shall be set at the site by the supplier. The contractor shall be responsible to ensure that a 6-inch base of ¾″-minus gravel, compacted to 90% of dry density is supplied, and shall be no more than 2% off level prior to setting the manhole. The interface between the cover and frame assembly and the enclosure shall be sealed using a waterproof substance, such as tar or mastic. The top of the access cover shall be flush with the final grade. Setting depth shall be determined by the local regulatory authority for full-traffic areas.

7. Testing

7.1. Test Compliance

Manholes 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. Manholes shall also comply with requirements in applicable national standards.

8. 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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