
	<b>SECONDARY ENCLOSURES FOR ELECTRIC UNDERGROUND</b>	<b>028028</b>
<b>Asset Type:</b> Gas and Electric Distribution		<b>Function:</b> Construction, Maintenance, and Operation
<b>Issued by:</b> S. K. Chang (SKC5) 		<b>Date:</b> 10-15-09
<b>Rev. #15:</b> This document replaces PG&E Document 028028, Rev. #14. For a description of the changes, see Page 15.		

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

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

**Purpose and Scope**

This document provides specifications for secondary enclosures through 36" x 60". Also included are ordering information, illustrations, and application instructions.

**General Information**

1. This document illustrates the various sizes of non-concrete and precast concrete enclosures used in electric underground secondary distribution.
2. The design loads for these subsurface enclosures are specified in [Engineering Material Specification No. 51, "Non-Concrete Enclosures"](#).
3. Requirements for non-concrete boxes:
  - A. Non-concrete boxes for incidental loading must meet the requirements of [Engineering Material Specification No. 51, "Non-Concrete Enclosures."](#)
  - B. The cover and exposed portions of a box shall be a concrete color.
  - C. Boxes shall comply with this document concerning marking, security devices, and dimensions.
  - D. Box covers must have PG&E identification. The box body and cover must be labeled with the manufacturer's name, box weight, and have the PG&E code number on inside surfaces.
  - E. The cover shall be made of polymer concrete and shall have a PG&E-approved high coefficient of friction (0.65 or better), slip-resistant surface.
  - F. Non-concrete parts shall be interchangeable.
4. Requirements for concrete boxes:
  - A. Concrete boxes for full-traffic must meet the requirements of the latest [ASTM C-857](#).
  - B. Boxes shall also comply with this document's requirements, such as marking, security devices, and dimensions.
  - C. Concrete parts shall be interchangeable. Concrete joints shall be interchangeable with those shown on Pages 10, 12, and 14.
  - D. Covers shall have a PG&E-approved high coefficient of friction (0.65 or better), slip-resistant surface.
  - E. Box covers must have PG&E identification. The box body, cover, and extension must be labeled with the manufacturer's name, box weight, and have the PG&E code number on inside surfaces.
5. Requirements for pedestals:
  - A. Pedestals must meet the [WUC Guide 3.6](#) sidewall deflection criteria with 600 pounds per square foot (psf) applied to the base per the [WUC Guide 3.6](#) test protocol.
  - B. Pedestal covers must withstand, without damage, 60 foot-pound impact test with a 2-1/2 inch diameter test tup dropped directly on top of the cover.
  - C. Pedestals shall comply with this document's requirements, such as marking, security devices, and dimensions.
  - D. The pedestal covers must have PG&E identification. The pedestal body and covers must be labeled with the manufacturer's name and shall be Muncell green in color.

**Application**

6. Consider the following when selecting box/pedestal sizes:
  - A. Secondary pedestals are the preferred method of terminating 600 V conductors in residential, small commercial applications, and in flood plain areas. Do not use secondary pedestals where wild grassland fires are prevalent.
  - B. Ultimate predictable conductor size and number.
  - C. Location of duct entrances, cable layout, and minimum bending radius of cables.
7. The 26" boxes are required for installations of conductors larger than 350 kcmil.
8. When setting concrete boxes in place, use spacers to adjust the box to grade. Install boxes as level as practical, but do not exceed 1/8" per foot slope in any direction. Place grout in and around duct entrances. Do not pave over the box cover.
9. Secondary boxes shall not be used for primary cable. The minimum box size for primary cable is 3' x 5' x 42".
10. Swedge reducers are necessary with conduit smaller than the terminators supplied (see [Document 062288](#)).
11. All conduits are to be stubbed a minimum of 2 inches from the pedestal or subsurface enclosure.
12. Conduit entry shall be as shown in Figure 4 on Page 5 for pedestals and Figure 8 on Page 8 for splice boxes. When an extended depth box or an extension is used, conduits may enter through terminals or knockouts.
13. Conduits that do not terminate in a duct terminator or belled end must be fitted with an end bell.
14. Boxes shall be set on a 6-inch gravel bed.
15. See [Document 066205](#) for replacement parts for older style installations.

**References**

	<b>Location</b>	<b>Document</b>
<a href="#">Connectors for Insulated Cables Underground</a>		
<a href="#">Distribution Systems</a> .....	<a href="#">UG-1: Connectors</a> .....	<a href="#">015251</a>
<a href="#">Multi-Tap Splice for 600-Volt Insulated Cables</a> .....	<a href="#">UG-1: Splices</a> .....	<a href="#">036640</a>
<a href="#">Straight and Tap Splice for 600 Volt Insulated Cable</a> ..	<a href="#">UG-1: Splices</a> .....	<a href="#">051034</a>
<a href="#">Identification Plates for Subsurface Enclosures</a> .....	<a href="#">UG-1: Marking</a> .....	<a href="#">051768</a>
<a href="#">Primary Electric Underground Equipment Enclosures</a> ..	<a href="#">UG-1: Enclosures</a> .....	<a href="#">062000</a>
<a href="#">Underground Conduits</a> .....	<a href="#">UG-1: Conduits</a> .....	<a href="#">062288</a>
<a href="#">Enclosure Repair/Replacement Criteria and Replacement Materials</a> .....	<a href="#">UG-1: Enclosures</a> .....	<a href="#">066205</a>
<a href="#">PG&amp;E Approved Manufacturers</a> .....	<a href="#">TIL</a> .....	<a href="#">066211</a>
<a href="#">Engineering Material Specification No. 51, "Non-Concrete Enclosures"</a> .....	<a href="#">TIL</a> .....	<a href="#">EMS51</a>

**Hyperlinks Are Inactive**  
**Secondary Enclosures for Electric Underground**

**Table 1 Guide for Application of Splice Boxes and Pedestals in New Construction for Underground Secondary Using Multi-Tap Splices (see [Document 036640](#)) <sup>1</sup>**

Bus Bar Information		Enclosure Size					Pedestal Size <sup>2</sup>	
Description	-	11-1/2"	13" x 24"	17" x 30"	24" x 36"	36"x60" <sup>3</sup>	10" x 14"	14" x 22"
4 Terminal	#6 Str - 350 kcmil	For Streetlight Applications Only (see Note 2 on Page 6)	For Service Runs and Non-Bus Bar Splices (4/0 max)	x	-	-	x	-
6 Terminal	#6 Str - 350 kcmil			x	-	-	x	-
8 Terminal	#6 Str - 350 kcmil			-	x	-	-	x
4 Terminal	4/0 - 1,000 kcmil			-	x <sup>4</sup>	x	-	x
6 Terminal	4/0 - 1,000 kcmil			-	x <sup>4</sup>	x	-	x
6 Terminal	(4) #6 - 350, (2) 4/0 - 1,000			-	x <sup>4</sup>	x	-	x
8 Terminal	(4) #6 - 350, (4) 4/0 - 1,000			-	x <sup>4</sup>	x	-	x

<sup>1</sup> For approved suppliers, see [Document 066211](#).

<sup>2</sup> For single-phase applications only.

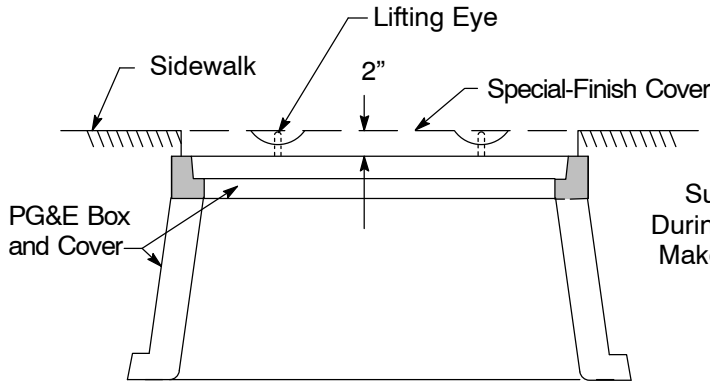
<sup>3</sup> If using splices, 36" x 60" enclosure can accommodate up to 12 runs (6 ins and 6 outs) of 1,000 kcmil or smaller wires.

<sup>4</sup> 1,000 kcmil installations require a 26-inch deep non-concrete enclosure or a 12-inch extension with a concrete enclosure. The maximum number of runs of 1,000 kcmil conductors will be limited to 2 (two); otherwise a 36" x 60" enclosure is needed.

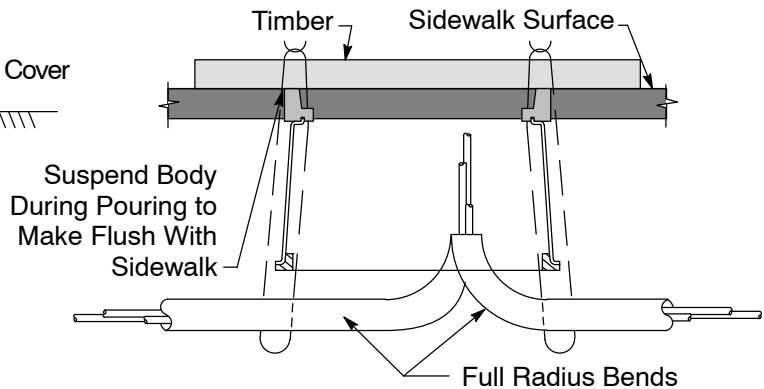
### ***Installation of Boxes in Special-Finish Sidewalks***

#### **Notes**

1. Frequently the customer or city (or other public body) installs special-finish sidewalks (brick, tile, terrazzo, etc.). When required with boxes through 3' x 5', the box and standard cover shall be installed 2 inches below the final grade, and the customer or city shall furnish and install the special-finish cover as illustrated in Figure 1.
2. The requirements for this cover shall be as follows:
  - A. No single section of cover shall exceed 125 pounds.
  - B. Provisions for removal shall be provided.
  - C. The special-finish cover shall be identified by the letter "E" to indicate the location of the PG&E splice box.
  - D. This type of installation shall not be installed in traffic locations.
  - E. **Caution:** PG&E cover design allows for a maximum of 1/2-inch deflection under an 8,000-pound or 12,000-pound design load, depending on the specified cover.



**Figure 1**  
**Installation of Boxes in Special-Finish Sidewalks**



**Figure 2**  
**Installation of Non-Concrete Boxes in Sidewalks**

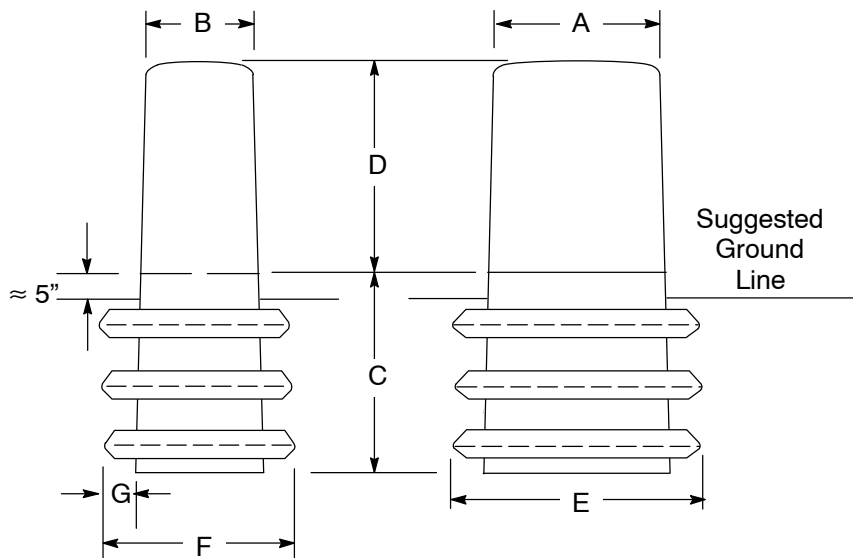
## Secondary Pedestals

### Notes

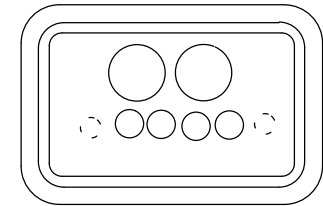
1. See [Document 036640](#) for appropriate sized connector.
2. The 10 x 14 pedestal can be used for conductor combinations through 6-way, 350 kcmil.
3. The 14 x 22 pedestal can be used for conductor combinations through 8-way, 4-1,000 kcmil; 4-350 kcmil.

**Table 2 Dimensions and Codes for Secondary Pedestals**

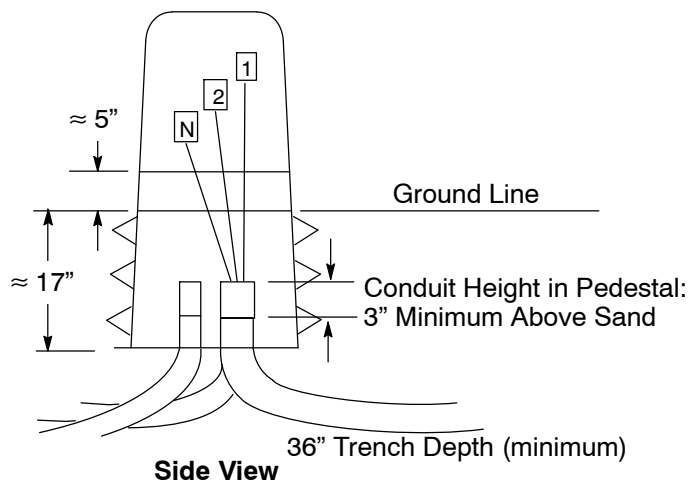
Type	A	B	C	D	E	F	G	Weight	Code
10 x 14	14-1/2"	10-1/4"	24"	22"	18-5/8"	14-5/8"	2"	20 lbs.	360007
14 x 22	22-1/2"	14-1/2"	24-1/2"	22"	25"	17-1/2"	2"	30 lbs.	360006



**Figure 3**  
**Dimensions of Secondary Pedestal Enclosure**



**Figure 4**  
**Preferred Location of  
Conduits Entering Pedestal**

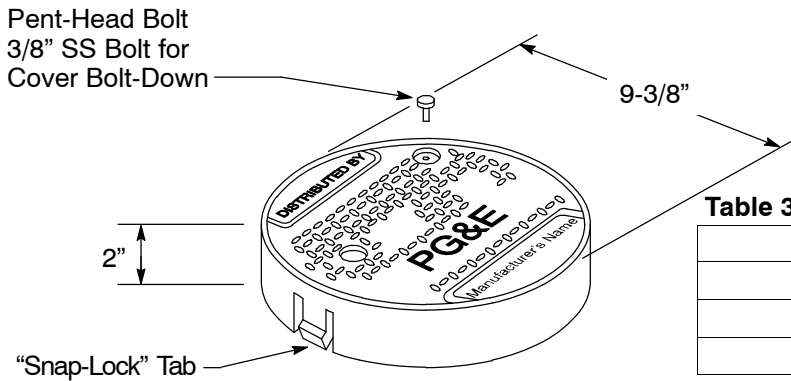


**Figure 5**  
**Secondary Pedestal Enclosure Installation**

### Streetlight Box Assembly

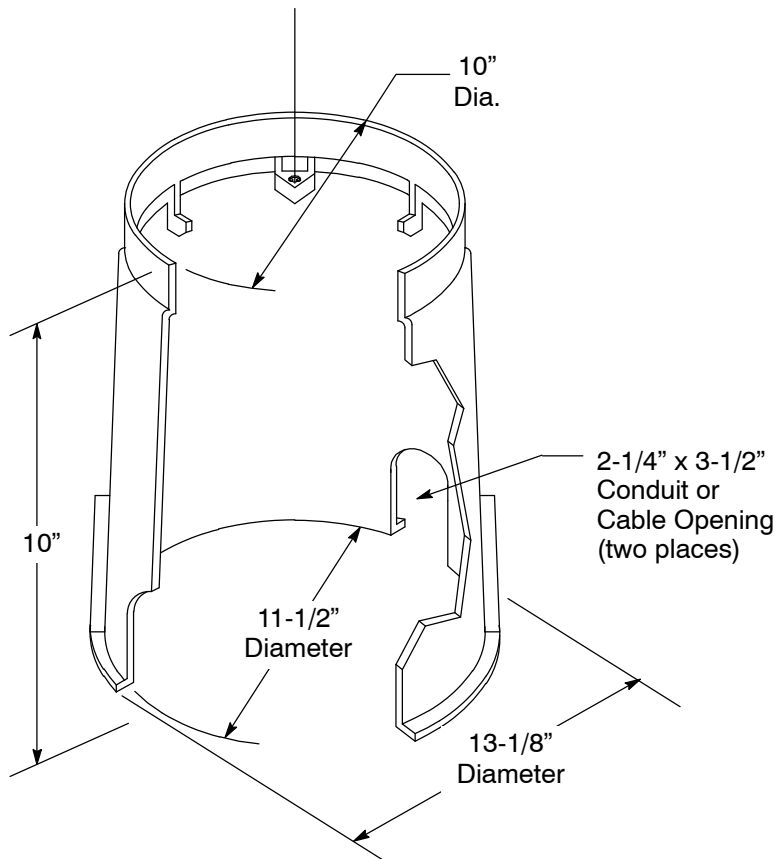
**Notes**

1. In conduit systems, enter the bottom of the box with 90° sweeps.
2. Do not connect more than two streetlights per box.
3. For streetlight applications only (see Table 1 on Page 3).



**Table 3 Codes for Streetlight Box Components**

Description	Code
Cover	032509
Body	032510
Complete Assembly	032511

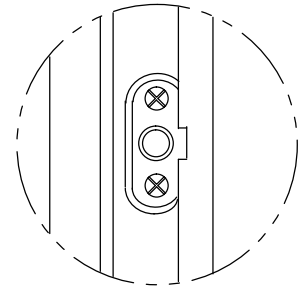
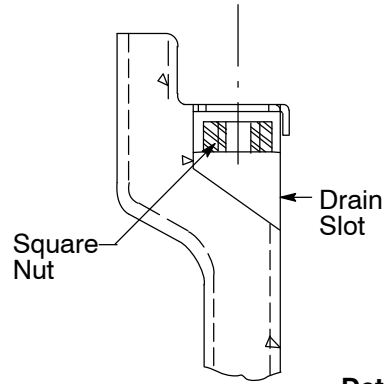
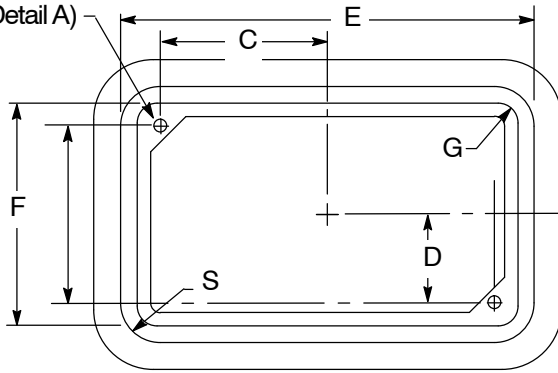


**Non-Concrete Boxes for Incidental Traffic**

**Note**

1. See Table 4 on Page 8 for box dimensions.

Bolt-Down Feature, Pent-Head, Coil Thread,  
1/2" x Length as Required, 1/2" Nut, Two Locations  
(see Detail A)

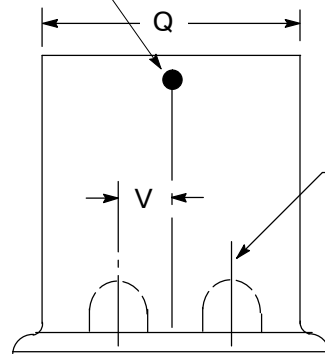
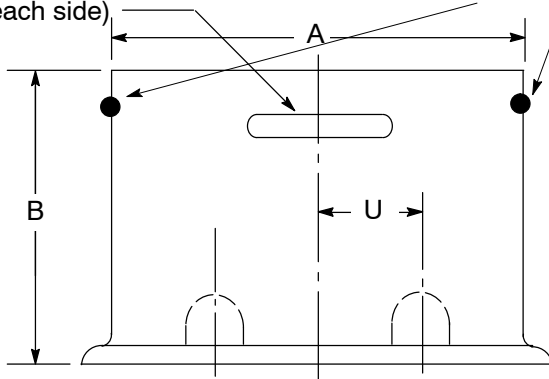


**Detail A**

Concrete Key (1-1/2" [38] x 15" [381])  
(one each side)

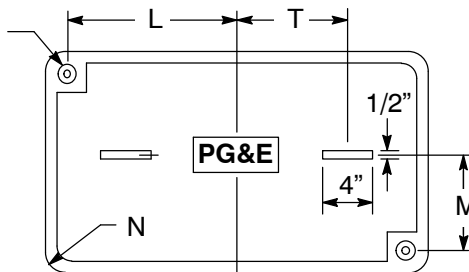
Thru Holes for Lifting Eye Bolts

(two lifting eye bolts on the  
13" x 24" box,  
17" x 30" box and four  
on the 24" x 36" box)

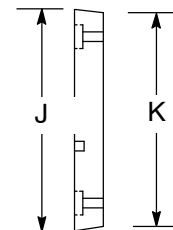


Single Knockout on  
13" x 24" x 26" Box

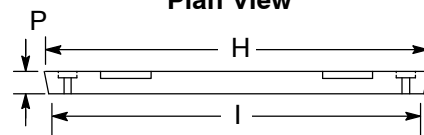
Hole for 1/2" Bolt With  
Recess for Head  
(see Detail A)



**Plan View**



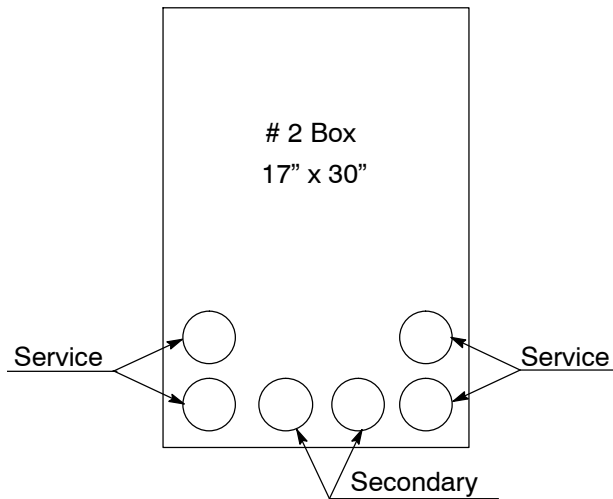
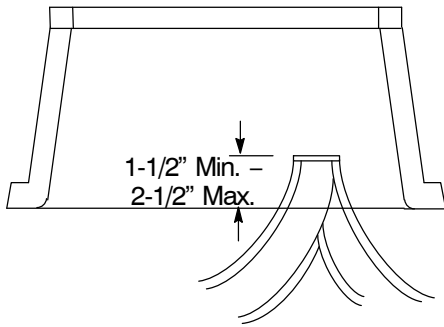
**End View**



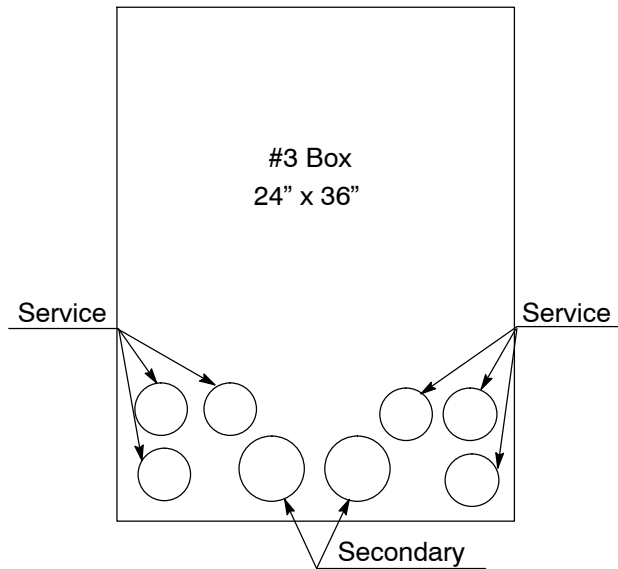
**Side View**

**Figure 7  
Cover**

**Non-Concrete Boxes for Incidental Traffic (continued)**



**Figure 8**  
**Preferred Location of Conduits Entering**  
**17" x 30" Splice Box**



**Figure 9**  
**Preferred Location of Conduits Entering**  
**24" x 36" Splice Box**

**Table 4 Codes for Box Components and Assemblies**

Box		Description	Code	
Size (inches)	Depth (inches)			
13 x 24	18	Body	040931	
	18	Assembly <sup>1</sup>	040933	
	26	Body	040920	
	26	Assembly <sup>1</sup>	040935	
	8,000 lb Cover			043716
	-			-
17 x 30 <sup>2</sup>	18	Body	040928	
	18	Assembly <sup>1</sup>	040936	
	26	Body	040929	
	26	Assembly <sup>1</sup>	040937	
	8,000 lb Cover			043720
	-			-
24 x 36	18	Body	040930	
	18	Assembly <sup>1</sup>	040940	
	26	Body	040919	
	26	Assembly <sup>1</sup>	040942	
	8,000 lb Cover			043724
	-			-
All	Pent-Head Bolt Coil Thread 1/2" x	2-1/2"	192853	
		3-1/2"	017488	
		4-1/2"	017489	

<sup>1</sup> Includes cover and body.

<sup>2</sup> Only six conduits allowed in 17" x 30" boxes.

**Non-Concrete Boxes for Incidental Traffic (continued)**

**Table 5 Dimensions of Non-Concrete Boxes**

Box Size (inches)	Dimensions (inches)									
	A	B	C	D	E	F	G	H	I	J
13 x 24 x 18	25-1/4	18	9-7/8	5-1/8	23-1/2	14	1-1/2	-	-	-
-	-	-	-	-	-	-	-	-	-	-
13 x 24 x 26	25-1/4	26	-	-	29-1/4	19-3/4	-	-	-	-
13 x 24 Cover	-	-	-	-	-	-	-	23-1/4	23	13-3/4
17 x 30 x 18	32-1/2	18	13-1/4	6-3/4	30-3/4	17-3/4	1-1/2	-	-	-
-	-	-	-	-	-	-	-	-	-	-
17 x 30 x 26	32-1/2	26	-	-	30-3/4	17-3/4	-	-	-	-
17 x 30 Cover	-	-	-	-	-	-	-	30-1/2	30-1/4	17-1/2
24 x 36 x 18	37-7/8	18	15-9/16	9-3/4	35-7/8	24-1/4	5-1/8	-	-	-
-	-	-	-	-	-	-	-	-	-	-
24 x 36 x 26	37-7/8	26	15-9/16	9-3/4	35-7/8	24-1/4	5-1/8	-	-	-
24 x 36 Cover	-	-	-	-	-	-	-	35-5/8	35-1/8	24

Box Size (inches)	Dimensions (inches)							
	K	L	M	N	P	Q	S	T
13 x 24 x 18	-	-	-	-	-	15-3/4	4-5/8	-
-	-	-	-	-	-	-	-	-
13 x 24 x 26	-	-	-	-	-	15-3/4	4-1/2	-
13 x 24 Cover	13-1/2	9-7/8	5-1/8	1-3/8	2	-	-	8
17 x 30 x 18	-	-	-	-	-	19-1/2	4-5/8	-
-	-	-	-	-	-	-	-	-
17 x 30 x 26	-	-	-	-	-	19-1/2	4-1/2	-
17 x 30 Cover	17-1/4	13-1/4	6-3/4	1-3/8	2	-	-	9
24 x 36 x 18	-	-	-	-	-	26	6	-
-	-	-	-	-	-	-	-	-
24 x 36 x 26	-	-	-	-	-	26	6	-
24 x 36 Cover	23-1/2	15-9/16	9-3/4	5	3	-	-	11

**Table 6 Knockout Dimensions of Non-Concrete Boxes**

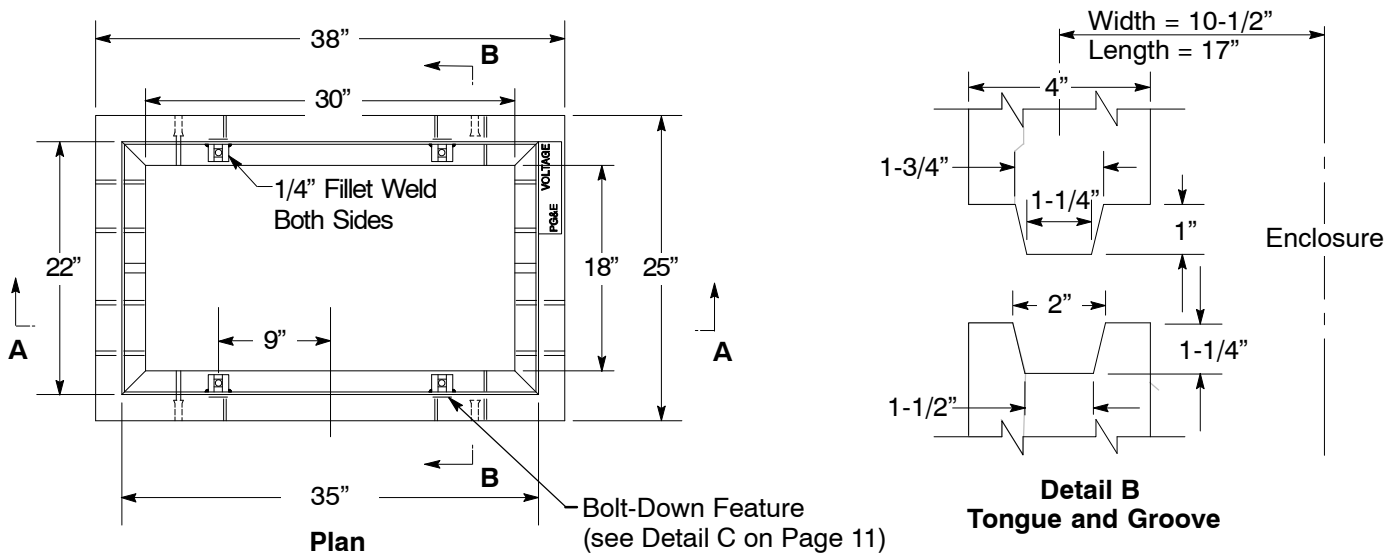
Box Size	Dimensions (inches)		Number of Knockouts
	U	V	
13" x 24" x 26" <sup>1</sup>	7-1/2	0	6
17" x 30" x 26" <sup>1</sup>	10-1/2	5	8
24" x 36" x 26" <sup>1</sup>	11	5-1/2	8

<sup>1</sup> Knockouts in 26" deep boxes only.

**17" x 30" Concrete Boxes for Full Traffic**

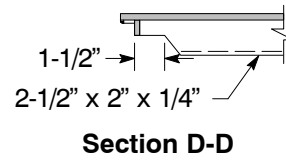
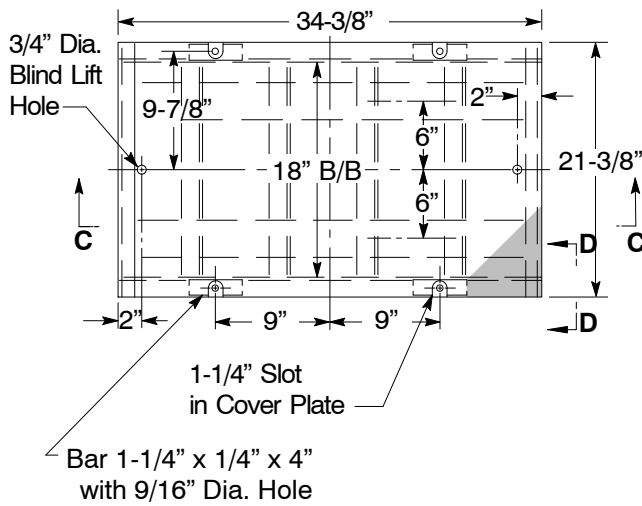
**Notes**

1. Grade adjustment, when required, shall be made between the box and the extension or top section.
2. A base is not required.
3. All concrete parts shall be permanently identified as to the manufacturer on the inside surface. The weight shall be stenciled on the outside of all concrete parts.
4. All concrete parts shall be provided with four 7/8-inch diameter, 1-3/4-inch minimum deep inserts with UNC Class 2A threads.
5. Joints must be interchangeable with those shown in Detail B and approved by distribution standards personnel.



**Figure 10**  
**Concrete Enclosure**

**17" x 30" Concrete Boxes for Full Traffic (continued)**

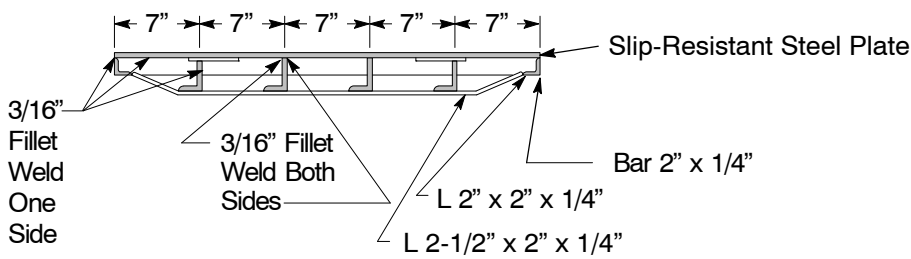


**Table 7 Codes for Complete 17" x 30" Concrete Box Assemblies**

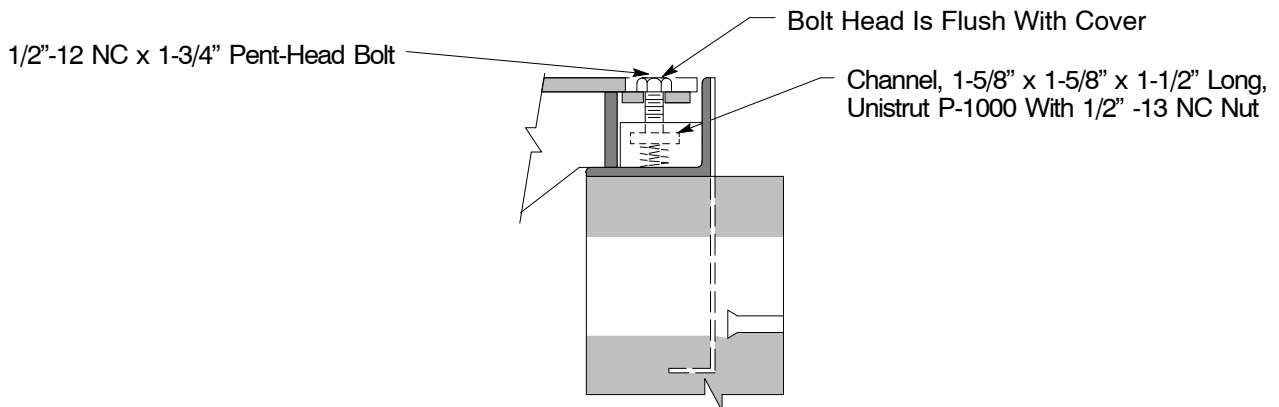
Box		Code <sup>1</sup>
Type	Depth	
Full-Vehicular-Traffic With Slip-Resistant Cover	24"	019588
	30"	019597
Extension	6"	043517

<sup>1</sup> PG&E assembly code includes body with a 6" or 12" top section with cast-in frame and a cover. If more depth is required, order the 6" extension.

**Cover**



**Section C-C**



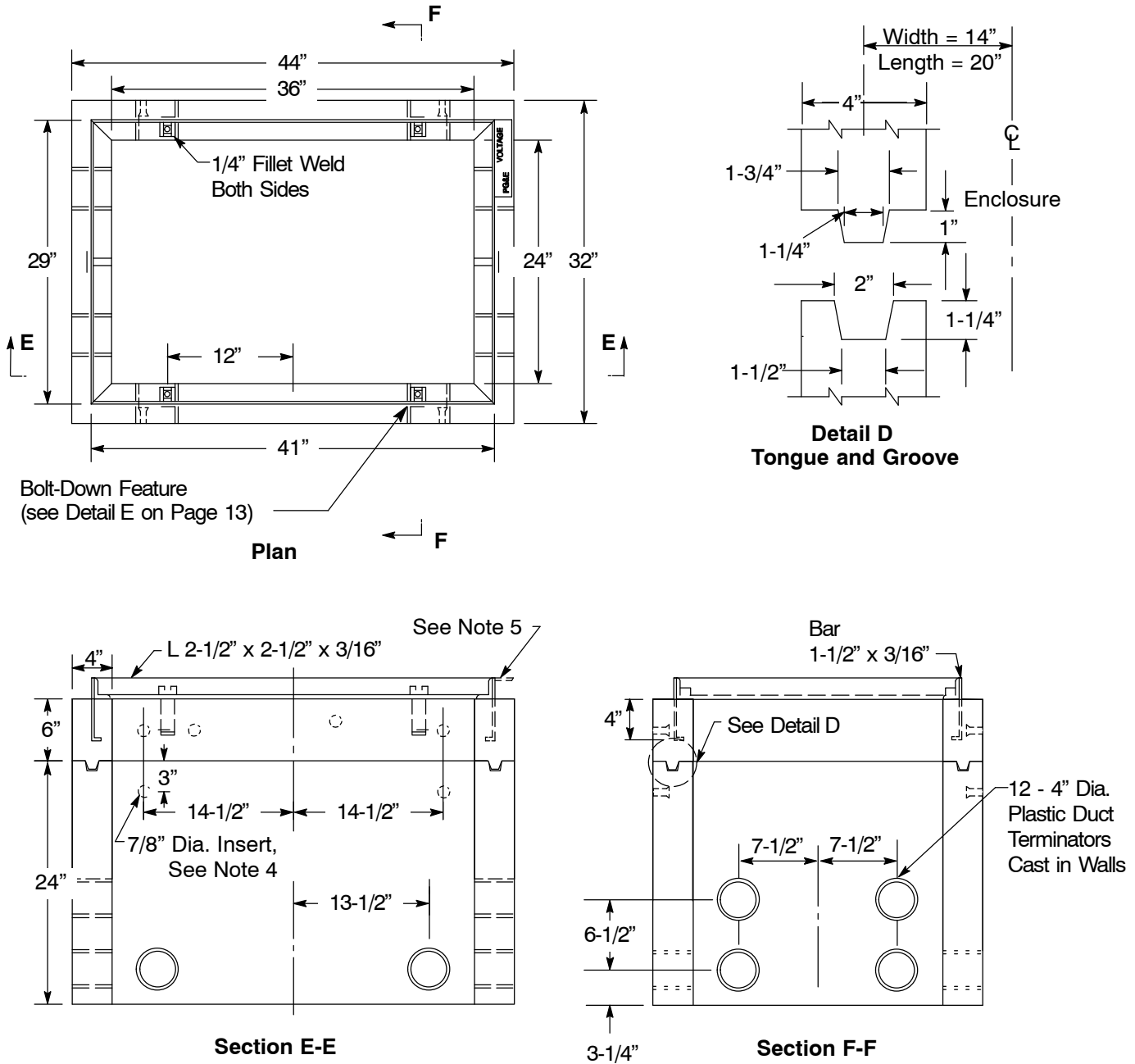
**Detail C  
Bolt-Down Feature**

**Figure 11  
17" x 30" Cover**

**24" x 36" Concrete Boxes for Full Traffic**

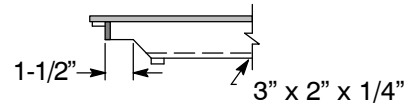
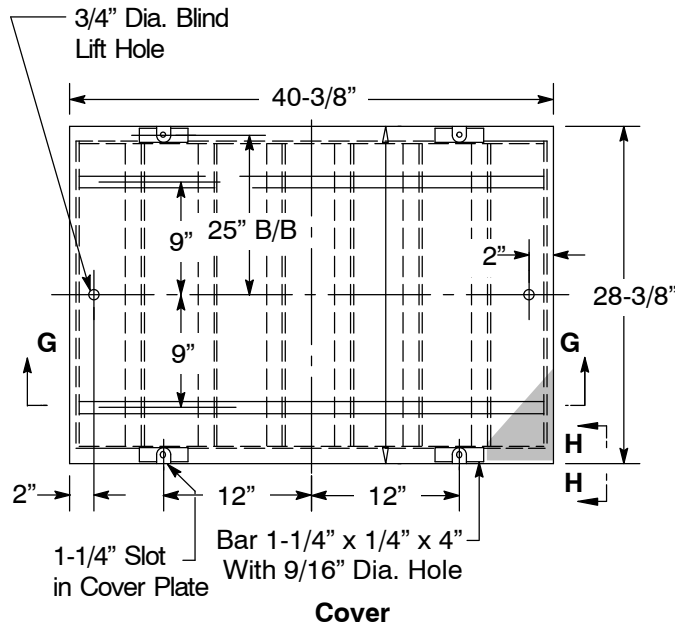
**Notes**

1. Grade adjustment, when required, shall be made between the box and the extension or top section.
2. A base is not required.
3. All concrete parts shall be permanently identified as to the manufacturer on the inside surface. The weight shall be stenciled on the outside of all concrete parts.
4. All concrete parts shall be provided with four 7/8-inch diameter, 1-3/4-inch minimum deep inserts with UNC Class 2A threads.
5. The identification plate is to be welded to the frame by the manufacturer (see [Document 051768](#) and Figure 12).



**Figure 12**  
**24" x 36" Concrete Box**

**24" x 36" Concrete Boxes for Full Traffic (continued)**

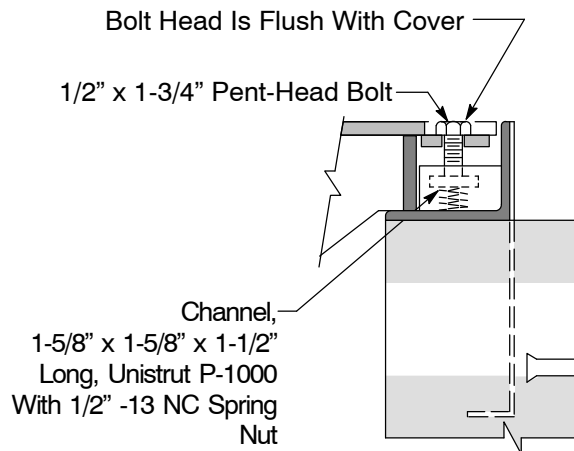
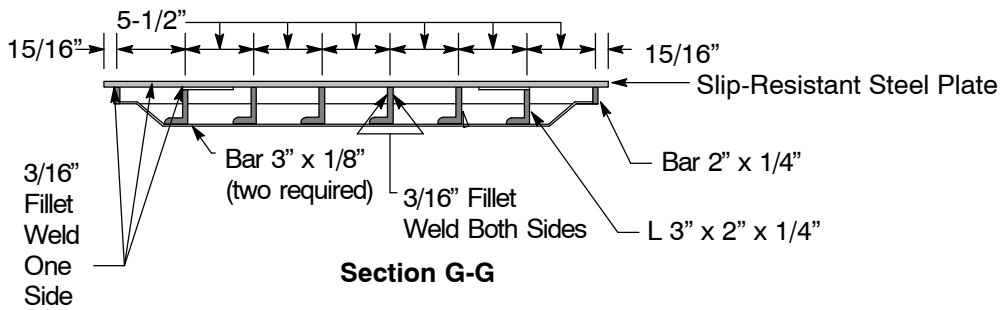


**Section H-H**

**Table 8 Codes for Complete 24" x 36" Concrete Box Assemblies**

Box		Code <sup>1</sup>
Type	Depth	
Full-Vehicular-Traffic With Slip-Resistant Cover	30"	019598
	36"	019599
Extension	6"	043521

<sup>1</sup> PG&E assembly code includes body, 6" or 12" top section with cast-in frame and cover. If more depth is required, order a 6" extension.



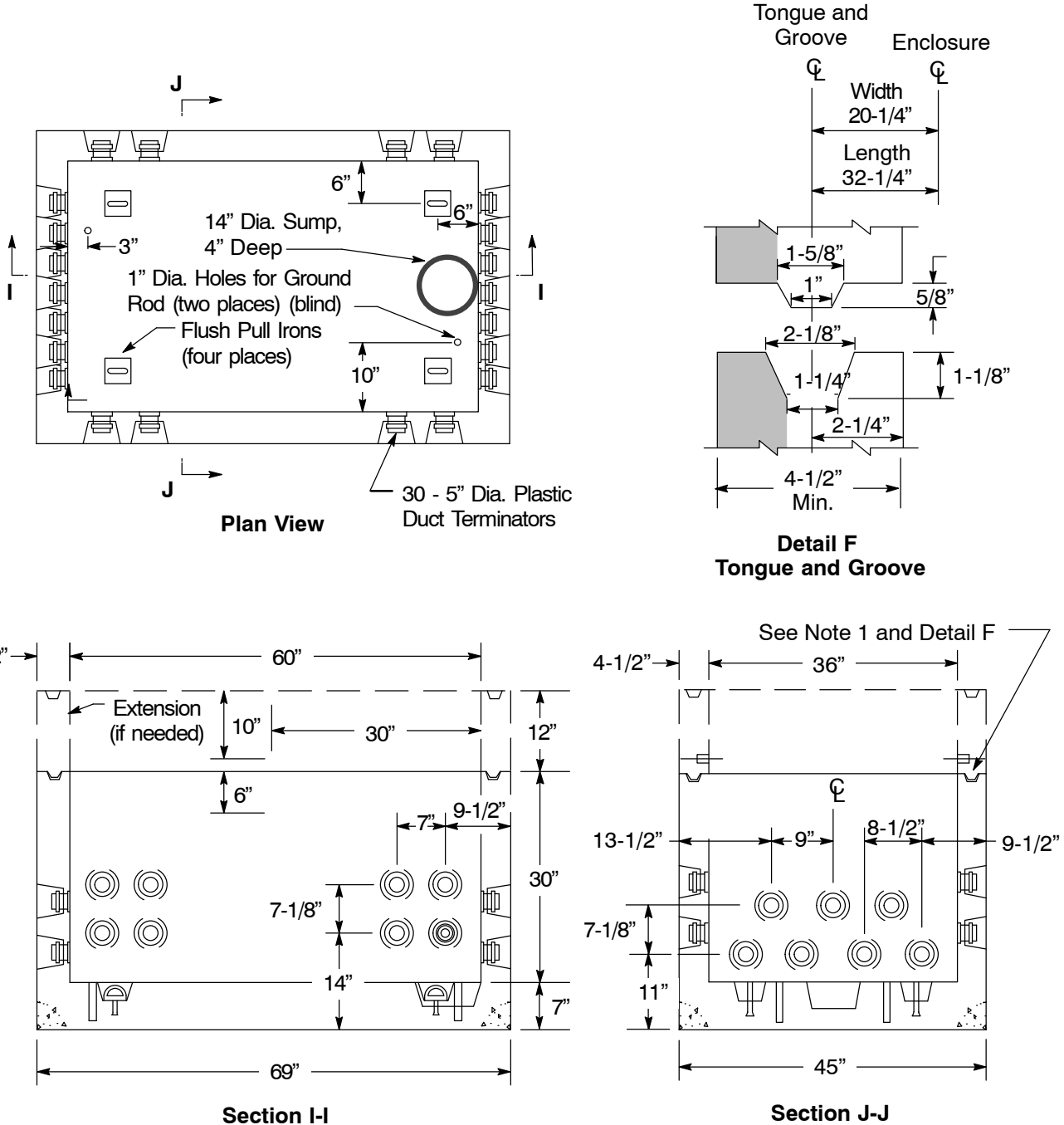
**Detail E  
Bolt-Down Feature**

**Figure 13  
24" x 36" Steel Cover**

**36" x 60" Incidental- and Full-Traffic Concrete Boxes**

**Notes**

1. Joints must be interchangeable with those shown in Detail F.
2. Mastic sealant is to be included with the enclosure assembly for all concrete-to-concrete joints below surface level.
3. Pulling irons shall be designed for 20,000 pounds ultimate, with a safety factor of 2 (40,000 pounds).
4. Boxes shall be lifted using pulling irons in the floor.



**Figure 14**  
**36" x 60" Concrete Box**

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**36" x 60" Incidental- and Full-Traffic Concrete Boxes (continued)**

**Table 9 Codes for 36" x 60" Concrete Box**

Box		Code
Type	Depth <sup>1</sup>	
Incidental-Traffic Assembly	30"	032506
Full-Traffic Assembly		032507 <sup>2</sup>
Body		032508

<sup>1</sup> When extra depth is required, order additional 12" extensions (see [Document 062000](#)).

<sup>2</sup> This code includes a 12" extension to accommodate the heavy full-traffic cover.

**Revision Notes**

Revision 15 has the following changes:

1. Revised the placement of Footnote 3 in Table 1 on Page 2.
2. Revised Footnote 4 in Table 1 on Page 2.
3. Revised dimensions in Figure 8 on Page 7.